



UiT The Arctic University of Norway

Doctoral degrees 2019



DOCTORAL DEGREES 2019

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Cover photo: "Tallerkenis" by Jo Jorem Aarseth

Layout: Graphic Services

121 new doctoral degrees in 2019 at UiT The Arctic University of Norway

A total of 121 doctoral degrees were awarded at UiT The Arctic University of Norway (UiT) in 2019, three more than in 2018. Of these, 63 candidates defended their doctoral thesis in the spring semester and 58 in the autumn semester. In all, 68 women and 53 men defended their doctorate at UiT, while 50 doctors came from 22 countries outside Norway.

In 2019, six of the university's seven faculties offered PhD programmes. The number of doctors were distributed as follows (2018 in parentheses):

Faculty of Biosciences, Fisheries and Economics: 13 (13)

Faculty of Engineering Science and Technology 0 (2)

Faculty of Health Sciences: 59 (65)

Faculty of Humanities, Social Sciences and Education: 16 (13)

Faculty of Law: 6 (3)

Faculty of Science and Technology: 27 (22)

General information about doctoral degrees

A doctoral degree is the highest academic degree awarded by Norwegian educational institutions. The doctoral degree qualifies for research work of high academic level and for work in the community requiring scientific insight. In order to be admitted to a PhD programme, it is a prerequisite that the student has completed a master's degree or a programme of professional study.

The PhD programme is a three-year full-time programme. Some scholarships are for four years, where the doctoral study constitutes 75% and other duties such as teaching, etc. amounts to 25%. Many of the PhD students are affiliated with a research school. Doctoral degrees organised in this way are the most common. This leads to the degree of Philosophiae Doctor (PhD). The PhD studies are financed either by grants from UiT or by external funding, e.g. from The Research Council of Norway.

It is also possible to work outside an organised doctoral programme and attain the degree of Doctor Philosophiae (Dr.Philos). The Dr.Philos. degree is an independent degree without supervision and organised training. The degree is achieved after evaluation of a scientific thesis, trial lecture and defence.

In 2019 120 candidates attained the PhD degree and one attained the Dr.Philos. degree. In addition, one person defended her project work through The Norwegian Artistic Research Programme (NARP). The programme is the highest level of education in creative and performing arts in Norway and is equivalent to a PhD degree.

Most theses are published in Munin, which is UiT's digital knowledge archive. However, some were not ready when this brochure was printed. You can search for the candidate's name on <https://munin.uit.no/>. Read more about research at UiT on <https://en.uit.no/forskning>

Faculty of Biosciences, Fisheries and Economics

Department of Arctic and Marine Biology

Snorre Bakke

Philosophiae doctor

*Life history and distribution of the edible crab (*Cancer pagurus*) in Norway - Effect of temperature and other environmental parameters at high latitudes*

The edible crab (*Cancer pagurus*) is an important fisheries resource in Norway. However, compared to the well-studied crab populations which are harvested further south in Europe, we know little about the biology of the edible crab in Norwegian waters. This study shows that female crabs become sexually mature at a similar size across the species distribution, but that crabs in more northern climatic conditions have a slower growth and a delayed reproductive cycle. Crabs at higher latitudes thus mature at a later age and are possibly more sensitive to fishing pressure due to slower growth of individuals. Laboratory experiments also show that, if crabs (including crabs from Northern Norway) are allowed to choose, they prefer a rather warm temperature of about 13 °C. In this study, I also present results showing that in some places in Norway during winter crabs move to greater depths than commonly believed, and that the mortality during the time at these depths might be high.

Page link to thesis: <https://munin.uit.no/handle/10037/15562>

25 June 2019

Ane-Cecilie Kvernvik

Philosophiae doctor

Ecophysiological Responses of Sea Ice Algae and Phytoplankton to a Changing Arctic



Single-celled algae are a main source of food for aquatic life and account for half of the photosynthetic activity on earth. The ice-covered seas of the Arctic have two major types of these primary producers: phytoplankton growing in open waters and sea ice algae growing within and on the underside of the sea ice. This thesis investigates the controlling role of light availability on Arctic phytoplankton and sea ice algae. The results show that Arctic phytoplankton has evolved pronounced mechanisms into being flexible with different light levels they encounter. They maintained the photosynthetic machinery during the polar night, effectively exploited very low light for carbon fixation, handled light stress well, and successfully acclimated and took advantage of high light. The Arctic is warming more rapidly than any other oceanic region on the planet (commonly termed Arctic amplification), leading to reduced sea ice extent and thickness, earlier melt onset and declining snow cover. As a result, light levels

are expected to increase in the Arctic in the future and nutrient regimes are expected to change due to increased stratification of the water layers. Due to all the ongoing and predicted changes, it is obvious that productivity in the Arctic is going to change. Based on the results from this study, it is reasonable to assume that the balance between sea ice-based and oceanic production will change with respect to timing and quantity in a future Arctic.

Page link to thesis: <https://munin.uit.no/handle/10037/15199>

29 March 2019

Benjamin Merkel

Philosophiae doctor

Migration in seabirds: seasonal structure in space and environment across species, populations and individuals

Animal migration is a widespread phenomenon in nature, but many migrants are dwindling in numbers. This is especially true for seabirds, the most threatened group of all birds, which spend most of their life on the open ocean. The aim of this thesis was to understand how migration is structured in two species of seabirds, the common guillemot and Brünnich's guillemot, which breed across the Northeast Atlantic. To this end, I developed a novel method to estimate a bird's locations when at sea using small data loggers that record light and time. Both species spread out over large parts of the North Atlantic during the non-breeding period. However, breeding populations showed compartmentalised space use, meaning that different populations occupied only small subregions of the total area used by all populations, rather than spreading out and mixing with other populations. Similarly, individual birds showed conservative behaviour as they used similar migration routes year after year irrespective of the habitat they encountered. Differences between populations were also visible in their migration timing. Notably, arrival timing back at the colony after the winter was highly variable between populations, but all populations from both species arrived earlier each year over the 10 study years. Their conservative migratory behaviour might leave these two species vulnerable to large-scale changes in their environment, which are occurring at an ever-increasing rate, while the compartmentalised annual distribution allows for the potential extinction of an entire population by regional threats, either man-made or otherwise.

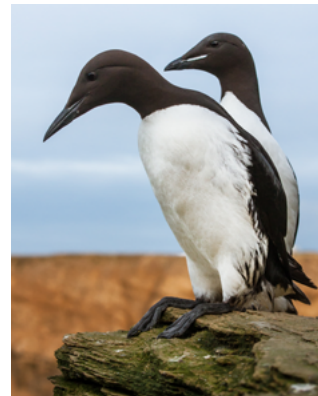


Photo: Háfríðnir Heigason

Page link to thesis: <https://munin.uit.no/handle/10037/15239>

21 May 2019

Javier Sanchez Romano

Philosophiae doctor

Infectious keratoconjunctivitis in reindeer - The role of the reindeer alphaherpesvirus

Reindeer have been herded in Fennoscandia for hundreds of years. Infectious keratoconjunctivitis (IKC) is the most common eye disease in ruminants. Large disease outbreaks, with severe clinical signs that can affect many animals, often take place in reindeer herds. This study aimed to investigate how IKC develops in reindeer by studying the main candidates as causative agents: the reindeer alphaherpesvirus (CvHV2) and the bacteria *Moraxella* and *Chlamydia*. Through clinical examinations, laboratory investigations and an experimental inoculation study, CvHV2 is reported as the agent causing the disease in reindeer, and as an initiator of secondary bacterial infections that worsen the clinical signs. It was also discovered how *Chlamydia* can be involved in IKC outbreaks in reindeer. However, more information regarding the viral and bacterial agents involved is still needed, and further investigations must be completed in order to better understand this disease and how to prevent and treat it.



Photo: Karine Nigar Aarskog

11 January 2019

Jesse Vallevik Brinkhof

Philosophiae doctor

Catch quality and size selectivity in the Barents Sea bottom trawl fishery: effect of codend design and trawling practice

This thesis describes the current challenges of catch quality and size selectivity in the Barents Sea bottom trawl fishery. The first part discloses a trawling practice (buffer towing), and its effect on the catch quality and size selectivity. Applying robust statistical methods, the results demonstrated a significant negative effect on both catch quality and size selectivity. The second part discloses a new trawl codend concept, which was designed to improve the catch quality without compromising size selectivity. The results from trials at sea demonstrated that the codend significantly improved the quality of trawl caught cod, with a minor increase in the retention of small fish. The thesis demonstrates the importance of evaluating the effect on both catch quality and size selectivity when altering components of the trawl gear or the operational practice during bottom trawling.

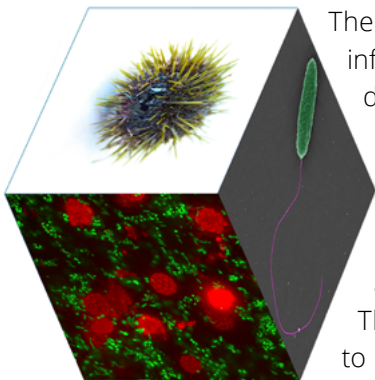
Page link to thesis: <https://munin.uit.no/handle/10037/14563>

14 February 2019

Jonathan Hira

Philosophiae doctor

*Host-Pathogen Interaction - Sea urchin (*Strongylocentrotus droebachiensis*) lesion syndrome and *Vibrio* bacteria*



The emergence of new bacterial pathogens and their associated infectious diseases is a global concern. *Vibrio* pathogen associated diseases are emerging due to climate change and the rise of sea surface temperature, ultimately having a detrimental impact on the life of human and marine animals. A good understanding of the host-pathogen interaction dynamics is essential to decipher the cellular and molecular basis of how these emerging pathogens alone or in a group participates in the development of the diseases.

This study investigated sea urchins lesion syndrome as a model to understand the role of *Vibrio* pathogens in disease development and their interaction with the host. This thesis has contributed to

discovering a novel *Vibrio* sp. from the diseased green sea urchins and proposed a name *Vibrio echinoideorum* NFH.MB010T. The model defined the novel bacteria as an opportunistic pathogen and has the virulence gene profile similar to the known *Vibrio* pathogens. Infectomics study on *V. echinoideorum*-sea urchin interaction at low temperature may serve as a good in vivo model for a comprehensive study on temperature dependent pathogenicity of opportunistic *Vibrio* pathogens. The findings presented in this work will be beneficial for other areas including sea urchin aquaculture, environmental toxicology, evolutionary studies, developmental biology, comparative immunology, and identification of bioactive compounds.

10 December 2019

Katja Häkli

Philosophiae doctor

The speciation landscape of European whitefish in Northern Fennoscandia – the importance of deglaciation history, standing genetic variation and natural selection

This thesis investigates the interplay between evolutionary processes and standing genetic variation in shaping phenotypic and genetic divergence, and how reproductive isolation is established and maintained in European whitefish (*Coregonus lavaretus* (L.)). Whitefish samples were collected from 36 lakes in three watercourses harbouring mono or polymorphic whitefish populations in northern Fennoscandia. The results of this thesis are in line with the theory of ecological speciation and show how selection has shaped the European whitefish morphs towards stronger phenotype-environment correlation and more diversified populations, despite the decreasing amount of standing genetic variation between the three contemporary watercourses. Thus, the occurrence of whitefish morphs in the three watercourses may be an outcome of convergent evolution, where similar phenotypes have arisen from different genetic backgrounds.

Page link to thesis: <https://munin.uit.no/handle/10037/16887>

10 December 2019

Mark Joseph Max Lomeli

Doctor Philosophiae

Bycatch Reduction in Eastern North Pacific Trawl Fisheries

This thesis provides an overview of recent selectivity studies conducted in eastern North Pacific trawl fisheries (e.g. West Coast groundfish bottom trawl fishery, Pacific hake [*Merluccius productus*] fishery, and ocean shrimp [*Pandalus jordani*] fishery). Collectively, these fisheries play a significant role in supporting fishing jobs, income, and coastal communities. However, bycatch can impact fishers' ability to fully utilize the fisheries resource. Thus, developing gear modifications to reduce bycatch are increasingly important. In this thesis, bycatch issues in eastern North Pacific trawl fisheries are presented. It demonstrates the ability of sorting grid devices to reduce bycatch while retaining a relatively high proportion of the targeted species. Findings suggest that use of illumination could have potential applications for reducing bycatch under certain situations. The efficacy of LEDs to reduce eulachon (*Thaleichthys pacificus*) and groundfish bycatch were examined. Results support the hypothesis that there is a significant reduction in eulachon bycatch when artificial illumination is present. The collective work presented within this thesis has contributed substantially to the development and advancements of gear modifications for reducing bycatch in eastern North Pacific trawl fisheries and the conservation of U.S. Endangered Species Act-listed species.

Page link to thesis: <https://munin.uit.no/handle/10037/16981>

20 December 2019

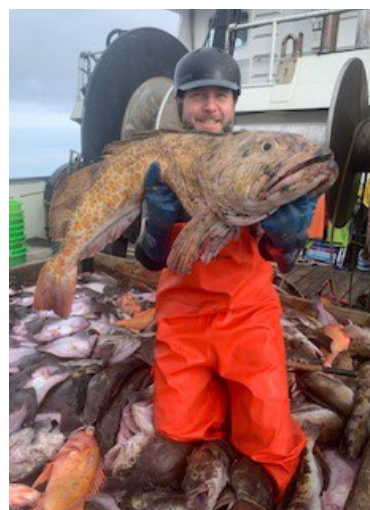


Photo: Private

Raja Priyanka Mary Michael Siranjeevi

Philosophiae doctor

*Isolation and Characterization of New secondary metabolites from the Arctic Bryozoans *Securiflustra securifrons* and *Dendrobeatia murrayana**

Bryozoans are colonial, filter feeding aquatic invertebrates known from the tropical to Polar Regions. Due to the sessile nature of bryozoans and lack of immune system, they have evolved the ability to produce secondary metabolites as a chemical defense, which is enabling them to protect themselves from predators and to compete for space and food in a competitive environment and adapt to extreme environment conditions. The present study was focused on isolation and characterization of new compounds from Arctic marine bryozoans. The novel compounds securidine A and dendrobeatiamine A were isolated by using two different approaches such as bioassay and chemistry-guided isolation. Both compounds were tested in various bioassays including anticancer, antidiabetic, antioxidant and the ability to inhibit the biofilm formation, but no bioactivity was observed. Fractions of the organic extract of *S. securifrons* were also screened for antibacterial activity. The chemical analysis of the active fraction revealed that it contained several securamines along with securidine A. Among these, securamine H was active against *B. subtilis* and the mode of action studies revealed that securamine H reduced the metabolic activity of *B. subtilis*, but no interference with bacterial intracellular metabolic processes were found. To address any synergistic interactions, the minor compound securamine H and the major compound securidine A were assayed together, but no such effect was observed.

Page link to thesis: <https://munin.uit.no/handle/10037/15918>

20 August 2019

Gunnar Sander

Philosophiae doctor

Implementation of ecosystem-based ocean management

Ecosystem-based management (EBM) is a holistic approach for nature management that aims at achieving good health and sustainable use of ecosystems. Key undertakings are assessment of cumulative impacts of all human activities, followed by elaboration and implementation of programmes of measures addressing unsatisfying conditions. EBM critically depends on assessments. The most relevant tool is strategic environmental assessment (SEA). A legal analysis in the thesis has demonstrated that SEA has a weak position in international law of the sea. The thesis also has compared the implementation of EBM in Norway and Canada. Canada enacted EBM obligations in law in 1996 and started trial projects that ended in 2012. Norway introduced a policy for EBM in 2001 and has later prepared management plans regularly. In Canada, two of the trial projects did not result in implementation of any new management measures. In Norway, most of the measures in the Barents Sea management plan are implemented, indicating that it has reduced pressures on the ecosystem. The different achievements can be explained by the different roles of the two governments in employing a “whole-of-government” approach, and the different capacities to solve conflicts. Consensus-based collaborative planning in Canada left most disagreements unresolved, whereas the Norwegian cabinet negotiated agreements on conflicts in package deals.

Page link to thesis: <https://munin.uit.no/handle/10037/15191>

29 March 2019

Charlotte Teresa Weber

Philosophiae doctor

Towards a framework to guide and facilitate interdisciplinary social-ecological system research in practice

In social-ecological systems (SES), humans relate to nature through their interactions with one another. These interactions can sometimes result in societal challenges, such as climate change or natural resource degradation. To study and solve these challenges, researchers investigate human-nature interactions through SES research, which can be very challenging. This study aims to guide and facilitate SES research by trying to make the practical process of conducting this research easier. To do so, the study develops a framework with guiding principles that can help researchers on how to do this research. The framework also provides coping strategies that can help researchers to prevent or overcome practical problems before and while conducting the research. With the help of this framework, it is hoped that SES research can be easier and that more societal challenges will be addressed.

Page link to thesis: <https://munin.uit.no/handle/10037/15238>

27 June 2019

Babak Ghassim

Philosophiae doctor

Embracing stakeholder engagement in sustainability-oriented innovation: Internal capabilities and dynamics of open innovation in the Norwegian minerals industry

This thesis is motivated by the need to ensure corporate sustainability in the minerals industry, which entails simultaneous improvements in economic, environmental and social performance. The transition towards a sustainable minerals industry will rely on pursuing sustainability-oriented innovation (SOI), requiring continuous innovations in extraction and production processes, product offerings and the way the industry deals with its social responsibilities. The overall aim of this thesis is to answer the following question: "Under which conditions and to what extent can engaging external stakeholders improve a firm's SOI outputs and financial performance?". This research question is explored through four sub-research questions in three empirical papers that draw on different theoretical perspectives and methodological approaches. The thesis provide insights into the conditions in which stakeholder engagement can be beneficial for SOI, and shows SOI itself as a mediating condition that can assist firms to reap the financial benefits from stakeholder engagement practices. The work contributes to the growing debate on how corporate sustainability generates a win-win situation (for a firm and its external stakeholders) by showing that SOI lays the basis for pursuing profit-maximizing objectives, while fulfilling social and environmental responsibilities.

Page link to thesis: <https://munin.uit.no/handle/10037/14544>

8 February 2019

Kjersti Kjos Longva

Philosophiae doctor

The impact of entrepreneurship education on students' career reflections

This thesis is motivated by the need for more knowledge on the career impact of entrepreneurship education. Findings in previous studies on this are inconclusive and the focus has traditionally been on whether entrepreneurship education has impact on students' decision to become entrepreneurs. Accordingly, the point of departure for the thesis is that present understanding of the impact of entrepreneurship education on career outcomes needs to be more comprehensive. The thesis therefore draws upon the literature on career development and investigates the impact of entrepreneurship education on students' career reflection. This is examined in the four papers of the thesis through a systematic literature review, two quantitative impact studies and an exploratory case study. The empirical findings suggest that entrepreneurship education can in fact function as a career exploration intervention that triggers students' career reflections. Overall, the thesis offers new insight into the complexity of the career impact of entrepreneurship education and demonstrates the relevance of the career development literature to this research field.

Page link to thesis: <https://munin.uit.no/handle/10037/16525>

25 November 2019

Sigurd Hadler-Olsen

Philosophiae doctor

Ectopic and normal maxillary canine eruption: maxillary incisor root resorption and interceptive treatment

The upper canines erupt in an abnormal position in 1–5 percent of children, possibly leading to damaged front teeth and the need for comprehensive dental treatment. This thesis aimed to provide new knowledge of the extent of damage to the roots of upper front teeth, and to assess the effect of treatment methods intended to normalize canine eruption. The study found that root damage caused by canines is common on front teeth, but not severe in most children. Headgear treatment had a positive effect on the upper canine eruption, but merits further study before being implemented in children with abnormal canines. Extraction of the primary canine alone was as beneficial as extraction of both the primary canine and first molar of children with palatal displaced canines. In conclusion, monitoring canine eruption in children is important, as adverse effects are common and extraction of the primary upper canine is currently the best preventative treatment for abnormally erupting canines.

Page link to thesis: <https://munin.uit.no/handle/10037/16734>

25 October 2019

Gro Eirin Holde

Philosophiae doctor

Periodontal health in Troms County, Northern Norway. Descriptive, subject level and site-specific analyses.

Half of adults in Troms County have periodontitis, and 1 out of 10 have severe forms of the disease. Findings are based on data from a cross-sectional study of 1,986 adults. Periodontitis is a chronic inflammatory disease of the supportive tissues of the teeth. With little information about periodontitis in Norway, the study aimed to estimate the prevalence of periodontitis in Troms County and to identify characteristics of persons with the disease. The study found that the presence of periodontitis increased markedly with age and was more common among men. Smoking increased the risk of periodontitis and masked early signs of disease. Use of dental services was mainly related to how people view their own resources, where dental anxiety and difficulty accessing dental services was related to less use. Those with regular dental visits did not have less periodontitis. The high burden of periodontitis, especially among older persons, elevates the importance of early diagnosis and preventive actions.

Page link to thesis: <https://munin.uit.no/handle/10037/16302>

20 September 2019



Photo: Espen Eridum

Swapnil Parashram Bhavsar

Philosophiae doctor

Drug resistance and the functional role of microRNAs in neuroblastoma

Neuroblastoma is the most common solid tumor in infants. Most of the children diagnosed above one year of age shows metastatic disease and poor prognosis. Chemotherapy is one of the principle modes of treatment. However, drug resistance represent a major clinical obstacle for the effective treatment of cancer. MicroRNAs (miRNAs) are small, non-coding RNAs that regulate gene expression, and dysregulation of miRNAs is commonly observed in different cancer types. Recently, miRNAs are shown to modulate drug resistance. However, the role of miRNAs in drug resistant neuroblastoma is limited and poorly understood. In this study, I performed miRNA-profiling study to elucidate miRNAs that are expressed in cell lines isolated from the same patients before (parental) and after chemotherapy (resistant). I observed different expression of 42 miRNAs across parental and resistant cells. Interestingly, miRNAs like miR-376c-3p and miR-323a-3p were significantly decreased in resistant cell lines and in primary neuroblastoma tumors. Further studies led to discoveries of the functional roles of miR-376c-3p and miR-323a-3p in neuroblastoma cells. This work contributes to a better understanding of complex regulatory roles of miRNAs in neuroblastoma.

Page link to thesis: <https://munin.uit.no/handle/10037/15603>

14 June 2019

Trond Børvik

Philosophiae doctor

Impact of Chronic Obstructive Respiratory Disease (COPD), respiratory symptoms and oxygen saturation on the risk of incident venous thromboembolism (VTE) and VTE-related mortality in a general population

Venous thromboembolism (VTE) is a collective term for pulmonary embolism and deep vein thrombosis. Half of VTEs are provoked (clear cause), while half are unprovoked (no clear cause). COPD is the largest smoking-related lung disease and the third leading cause of death in the world. Our investigations indicate that COPD increases the risk of VTE, and that the risk increases in line with the extent of the disease. It is believed that lowered oxygen saturation, coughing, dyspnoea (shortness of breath) and phlegm can increase the risk of VTE in patients with and without COPD. The combination of VTE and COPD can also increase the mortality risk. In our studies, we found that severe COPD increased the risk of VTE by 60%. The risk of provoked VTE in a patient with COPD was double that of a patient without COPD. The presence of lowered oxygen saturation and respiratory symptoms also increased this risk. Our findings suggest that the combination of COPD (regardless of stage) and VTE in a patient increases the risk of mortality compared with patients with only one of these conditions.

Page link to thesis: <https://munin.uit.no/handle/10037/16675>

1 November 2019

Sandra Flohr-Madsen

Philosophiae doctor

Studies of peripheral nerve blocks for hand and shoulder surgery

Regional anesthesia may be an alternative to general anesthesia for upper limb surgery. In the first study, the minimum effective volume of a local anesthetic (LA) for an infraclavicular block (LSIB, below the clavicle) was estimated. Its guidance may help minimizing the risk of adverse reactions to LA. The infraclavicular block tends to rotate the hand/forearm outwards. This is awkward for surgery at the back of the hand. In study II, a suprascapular nerve block (SSNB, cranial to the clavicle) was added to the infraclavicular block improving the hand position. Interscalene block (neck level) is the standard peripheral nerve block for shoulder surgery. Due to associated risk of palsy of the diaphragm, alternatives have been requested. In study III it was found that the novel block combination of a superficial cervical plexus block (neck level), SSNB, and LSIB provided good anesthesia for arthroscopic shoulder surgery patients.

Page link to thesis: <https://munin.uit.no/handle/10037/15264>

4 April 2019

Ina Heidi Heiberg

Philosophiae doctor

Mortality, substance use disorder and cardiovascular health care in persons with severe mental illness

People with severe mental illness in the Nordic countries die 15-20 years younger than others. The current thesis utilized nationwide registers to study mortality among patients with schizophrenia and/or substance use disorders, and uptake of diagnostic tests and treatment among patients with schizophrenia or bipolar disorder. The study found a four-fold (schizophrenia only) to seven-fold (substance use disorder with or without schizophrenia) increased mortality compared to the general population, implicating that more than 80% of patients with these disorders died prematurely, both from natural and unnatural causes of death. Patients with schizophrenia or bipolar disorder were more likely to die from undiagnosed and untreated cardiovascular disease. Uptake of invasive cardiovascular treatment did not differ if cardiovascular disease was diagnosed prior to death. Timely access to specialized somatic care, and a more effective prevention of unnatural deaths, is highly needed in this population.

Page link to thesis: <https://munin.uit.no/handle/10037/16284>

4 October 2019

Hanne Edøy Heszlein-Lossius

Philosophiae doctor

Life after war-related extremity amputations. A retrospective, descriptive clinical follow-up study from Gaza, occupied Palestine

Little is known about medical consequences of losing arm(s) or leg(s) in military attacks. Many Palestinians in Gaza have suffered loss of one or more limbs during recurrent Israeli military incursions. Such serious physical trauma poses grave health problems not only for the amputee, but also for their families and for the society at large. The problem is increasing. Hanne Heszlein-Lossius, MD, from UiT The Arctic University of Tromsø has together with her supervisor professor Mads Gilbert (UiT) and Palestinian research colleagues in Gaza conducted a study of 254 patients with war-related traumatic extremity amputations in Gaza. The patients attended Gaza's main rehabilitation centre, The Artificial Limb and Polio Centre (ALPC) in Gaza City for prosthesis and rehabilitation. The studies, published in The Lancet, BMJ and BMC found that the majority of the amputated Palestinians were young, well-educated men with large financial responsibilities, and often the family's sole breadwinner. Most traumatic amputations were major and will cause life-long disability. Losing the ability to work and thus losing income and the ability to care for one's family and put food on the table seemed to be an important trauma adding to the pain and loss of arms or legs. A variety of military weapons had caused the loss of limb(s) among the studied patients. Unarmed military airplanes (drones) carrying explosive weapons were the most common. Those who had been hit during drone-attacks suffered the most severe extremity amputations. The patients needed more surgical operations after drone strikes than amputations caused by other weapons.

Page link to thesis: <https://munin.uit.no/handle/10037/16053>

29 August 2019

Hanne Hoaas

Philosophiae doctor

Long-term exercise maintenance via telerehabilitation for people with COPD

Despite the fact that pulmonary rehabilitation (PR) and maintenance programs are beneficial and recommended to people with chronic obstructive pulmonary disease (COPD), their availability remains low. Telerehabilitation can support the delivery of such programmes to patients' homes. However, there is little knowledge of its benefits for people with COPD. This thesis aimed to investigate if long-term telerehabilitation in COPD is feasible and effective, and evaluate benefits and challenges. The study tested a two-year telerehabilitation intervention comprising of treadmill exercise at home, telemonitoring by a physiotherapist via videoconferencing, and self-management via a website in a pilot study and an international randomized controlled trial. Long-term telerehabilitation in COPD is safe and feasible, can prevent worsening of lung function and symptoms, and support maintenance of physical capacity. Long-term telerehabilitation could be offered as an alternative or supplement to centre-based PR.

Page link to thesis: <https://munin.uit.no/handle/10037/15618>

6 June 2019

Ina Isabella Høiland

Philosophiae doctor

Role of the Complement System in the Pathogenesis of Venous Thromboembolism

Venous thromboembolism (VTE) is a common disease with serious short- and long-term complications. The incidence of VTE has been stable or increasing slightly during the last decades, affecting 1-2 per 1000 individuals each year. Identifying new biomarkers and underlying mechanisms might ease the health burden of VTE. The complement system is an important part of our immune defence system, and is a cascade system similar to the coagulation system. These two systems have a high degree of crosstalk and are activated together in many conditions, such as fighting infections. Short-chained (SC)-PolyPs are secreted from platelets when they are stimulated and their linear polymers are reported to inhibit the complement, and to activate the coagulation system. This indicates that SC-polyP might modulate the possible link between the two systems, and play a role in the formation of a VTE. The main goals of this thesis were to assess the association between complement activation and VTE risk, and to investigate the role of SC-polyPs in the activation of these two systems. The study shows that individuals that had a potential of a high activity of one part of the complement system, and individuals with deficiency in another part of the complement system, had higher risk for VTE. The findings suggest that complement activation is involved in the pathogenesis of VTE, and that SC-polyP might initiate coagulation activation without affecting complement activation.

Page link to thesis: <https://munin.uit.no/handle/10037/15201>

2 April 2019

Mona Anita Kiil

Philosophiae doctor

In Home we trust. An ethnographic study of mental health and the use of traditional medicine in a North Norwegian community

Traditional medical practices used when faced with illness or crisis exist in many North Norwegian communities. Northern Troms has a historical multi-ethnicity of Sami, Kven and Norwegian. The notion of culture appears ambivalent and ambiguous, particularly concerning the Sami identity, but cultural diversity is nevertheless manifested through the use of traditional medicine practices such as reading. The participants had all been diagnosed with depression and anxiety disorders and were users of the outpatient mental health care clinic for Northern Troms. In addition, conventional therapists at the clinic, traditional healers and complementary and alternative providers participated. The findings revealed embodied dynamics of belonging and trust. As users of traditional medical practices, the participants experienced a significant sense of vulnerability in their encounter with the conventional mental health care. Lack of trust in regard to how their traditional and religious practices are being understood were expressed. Fear of misdiagnosis if they communicate their world-view and personal treatment philosophies was one issue.

Page link to thesis: <https://munin.uit.no/handle/10037/15192>

24 May 2019



Photo: Agnete Kristoffersen

Hege Kileng

Philosophiae doctor

Chronic hepatitis C: Epidemiology, viral resistance, and public health implications

Hepatitis C virus (HCV) is a blood borne, frequently asymptomatic, viral infection. Chronic HCV infection can progress to serious liver disease. Many infected individuals are unaware of the diagnosis until complications occur. The first aim of this thesis is to assess the prevalence of HCV infection in Tromsø by using data from the seventh survey of the Tromsø study (Tromsø 7). Secondly, by modelling, future complications of HCV infection in Northern Norway are projected. Finally, the effect of viral resistance in the treatment of HCV infection is evaluated. The results show a low prevalence of HCV infection in Tromsø. However, a substantial number of individuals were not aware of their infection. Further, a substantial increase in HCV-related disease and complications in the coming years is indicated. Finally, viral resistance can reduce the effect of treatment. Effective screening strategies, increased treatment uptake, and surveillance of antiviral resistance are needed in order to reduce the burden of the disease.

Page link to thesis: <https://munin.uit.no/handle/10037/15612>

14 June 2019

Anne Landsem

Philosophiae doctor

The role of complement and Toll-like receptors in thromboinflammation

Sepsis is a serious and complex disease leading to 5 million deaths worldwide every year. Although the immune system is working hard to overcome the bacteria, the inflammatory response can escalate and attack the host. Antibiotic is given to kill the bacteria. By studying the complement system, an important part of primary immune system, and its reaction with another part of this system, the Toll-like receptors (TLRs), this study aimed to improve the treatment of sepsis. A human blood model of inflammation developed at our research laboratory is used. Bacteria was added to blood from healthy donors and specific inhibitors of complement and TLRs were investigated as possible candidate drugs to treat sepsis. It was observed that each of the two inhibitors reduced the detrimental effects induced by the bacteria, while the combination of the two virtually abolished bacteria-induced clotting and inflammatory responses. The thesis has given knowledge that may contribute to new treatment of sepsis.

Page link to thesis: <https://munin.uit.no/handle/10037/15243>

23 May 2019

Maria Arlen Larsen

Philosophiae doctor

Early markers of metabolic disease in obesity

In this thesis, 50 obese individuals with and without lifestyle diseases were included, in addition to 17 normal weight and healthy individuals. The aim was to find sensitive, early biomarkers on metabolic dysregulations in obese individuals, and to examine fat metabolism and fat hormone regulation after a meal. This thesis found healthy obese individuals to have delayed fat metabolism, and resistance to the hormones insulin and leptin. Furthermore, obese individuals had an imbalance in the regulation of the hormones leptin and adiponectin after a meal. Fasting triglycerides in the upper normal level, and a measure of insulin resistance, HOMA-IR, were found to be sensitive biomarkers for early detection of metabolic dysregulation in obese individuals. The leptin:adiponectin ratio was found to be a suitable biomarker. This thesis adds novel and valuable knowledge in the field of energy metabolism in obese individuals, and suggests new biomarkers to detect lifestyle diseases early, to prevent disease and treat at an earlier stage.

Page link to thesis: <https://munin.uit.no/handle/10037/17326>

6 December 2019

Robin Amanda Liang

Philosophiae doctor

Role of Mannose-Binding Lectin and Complement Activation in Venous Thromboembolism

Venous thromboembolism (VTE) is a serious and complex disease with an annual incidence of 1-2 per 1000 persons. As it is accompanied by many grave short- and long-term complications, venous thromboembolism presents a large public health burden. The discovery of new mechanisms and potential biomarkers is crucial for the development of new treatment and prevention strategies. The coagulation system is responsible for stopping bleeding by clot formation at the site of injury. Excessive activation or dysregulation of the coagulation system results in inappropriate clot formation, called thrombosis. The coagulation cascade works closely with the complement system, another protein system in the blood plasma. Important functions of the complement system include integration of the innate and adaptive immune systems, development of tissues and organs, and the promotion of tissue repair. As the complement and coagulation systems are interlinked through several molecular mechanisms, dysregulation of the complement system also affects the coagulation system. Recent animal and in vitro studies support a role for the complement system in thrombogenesis. While many studies have investigated the role of the complement system in arterial cardiovascular disease, few have investigated its role in venous thromboembolism. This thesis explores the role of the complement system in the development of venous thrombosis, and seeks to investigate potentially prothrombotic mechanisms involved.

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17 December 2019

Ingvild Mathiesen Rosenlund

Philosophiae doctor

Too much medicine? A study investigating unwarranted regional variation and use of medical care

The overall theme of this thesis is unnecessary health care services and differences in care across regions. Using data from hospital health records, I have studied the practice of imaging diagnostics for patients with self-limiting kidney stone attacks. The results showed that imaging diagnostics was unnecessary for most patients. Women have no medical need of routine pelvic exams at gynecologists and the practice is recommended against. Using national data, we have found extensive use and regional variation of these exams. Gynecologists who are paid for each test they perform use additional tests to an extremely larger extent than other gynecologists. I also studied regional variation in health care services for diverticular disease, a condition with limited evidence on best practice. From national data, we found large variations in provided care between inhabitants of different regions. A major finding of this thesis was unwarranted use and variation of common health care services.

Page link to thesis: <https://munin.uit.no/handle/10037/15586>

3 July 2019

Björg Eva Skogøy

Philosophiae doctor

From policy to practice: Implementation of changes in law to support and protect children of ill parents



In 2010, Norway became one of the first countries to require by law that all health professionals play a part in the prevention of psychosocial problems in children of parents with all kinds of illnesses (mental illness, drug addiction, or severe physical illness or injury). The first study found significant implementation differences between five hospitals, with the lowest implementation scores from the smallest hospital. The second study showed that the health professionals scored high on knowledge and skills, and they were confident working with families and children, but reported moderate levels of family support and referrals. Significant differences were observed between the hospitals. The third study identified clear differences in family focused practices between the types of health professionals (nurses, social workers, physicians, and psychologists), with greater emphasis needed to encourage the family focus of physicians and psychologists. Collectively, the findings of this thesis contribute to a better understanding of the challenges hospitals

and the health professionals face to implement a new policy, law and guidelines.

Page link to thesis: <https://munin.uit.no/handle/10037/17328>

22 November 2019

Elise Thoresen Sletten

Philosophiae doctor

Significance of progestin therapy in endometrial proliferative diseases

Approximately 3% of women are diagnosed with uterine cancer during their lifetime. Most cases develop from a precursor lesion denoted endometrial hyperplasia (EH), a common disease in women of all ages. In the present thesis, all women diagnosed with EH became disease-free after six months of therapy with Jaydess, an intrauterine system originally developed as a contraceptive. Jaydess releases the growth inhibitory hormone levonorgestrel and, due to its intrauterine application, the local effect in the uterus is strong combined with few systemic side effects. These results introduce Jaydess as a new and effective therapy option for women diagnosed with EH. The study has also demonstrated that uterine expression of progesterone receptors in women with EH can be useful in selecting women with high risk of relapse of the disease after successful therapy. Thus, these findings might have implications for tailoring individualized therapy and follow-up strategies in women with EH.



8 February 2019

Birgit Småbrekke

Philosophiae doctor

Shared risk factors for arterial cardiovascular diseases and venous thromboembolism

Extensive evidence supports an association between arterial cardiovascular disease (CVD, i.e. myocardial infarction [MI] and ischemic stroke), and subsequent venous thromboembolism (VTE, i.e. deep vein thrombosis and pulmonary emboli). However, the mechanism behind the associations remains unclear. The aim of this thesis was to investigate the impact of ischemic stroke on VTE and to investigate potential shared risk factors for arterial CVD and VTE. The study populations for Paper I, II and III were recruited from the fourth, fifth and sixth survey of the Tromsø Study. In Paper IV, we recruited a subgroup of participants with genetic information from the Tromsø Study and from the Nord-Trøndelag Health (HUNT) Study. The findings imply a strong and transient increased risk of VTE after ischemic stroke and that the association between arterial CVD and VTE cannot be explained by atherosclerosis. Of the well-known cardiovascular risk factors, only age, obesity and family history of MI are associated with VTE. The association between arterial CVD and subsequent VTE is only partly explained by shared risk factors. The remaining association is likely mediated by risk factors following the arterial cardiovascular event, such as immobilization and infection, and direct effects of the arterial cardiovascular event, such as activation of the coagulation system.

Page link to thesis: <https://munin.uit.no/handle/10037/15580>

28 June 2019

Photo: Elise Thoresen Sletten

Vidar Tor Nyborg Stefansson

Philosophiae doctor

Obesity, renal hyperfiltration and glomerular filtration rate decline in the general population

Obesity is an important risk factor for several diseases, including kidney disease. The metabolic syndrome is a concept that includes obesity, elevated blood pressure and alterations in the levels of sugar and fat in the blood stream. Both obesity and the metabolic syndrome may cause a state of harmful overload on the kidneys called hyperfiltration. The study measured kidney function with accurate methods in a large, middle-aged population in Tromsø to shed more light on hyperfiltration and its relation to obesity and the metabolic syndrome. It was found that obesity is associated with hyperfiltration, and that the metabolic syndrome was associated with more rapid kidney function decline. It was also found that hyperfiltration was associated with albuminuria, which is an early marker of kidney damage. These findings indicate that the relationship between obesity and kidney damage is complex, and that damage to the kidneys may occur while kidney function appears to be high.

Page link to thesis: <https://munin.uit.no/handle/10037/15611>

11 June 2019

Hanne Kilen Stuen

Philosophiae doctor

Community Treatment Orders in an Assertive Community Treatment setting: a qualitative study of patients, care providers and responsible clinicians

This study is part of the national research-based evaluation of the 12 first assertive community treatment (ACT) teams in Norway that took place between 2009 and 2014. The purpose of this study was to investigate patients', care providers' and responsible clinicians' experiences with community treatment orders (CTOs) and CTO decision making in relatively newly established ACT teams. ACT is a model of multidisciplinary community-based treatment teams that aims to provide a full range of medical, psychosocial and rehabilitation services to people with severe mental illness. In this study, 15 in-depth interviews with patients subject to CTOs were conducted. Eight responsible clinicians were interviewed, and four focus group interviews with 20 providers were conducted. The results show the ACT team's availability and the flexible combination of interventions, continued care and possibility to make choices were considered as important improvements to traditional office-based mental health services. Several of the patients described a gradual transition of regarding the CTO as an acceptable solution, provided that they received other services they found beneficial. CTO decisions involve dilemmas and difficult professional judgments. The clinicians highlighted the importance of frequent patient contact and multidisciplinary team discussions, and noted that sharing ideas about clinical problems allowed for more flexibility and more voluntary treatment.

Page link to thesis: <https://munin.uit.no/handle/10037/16695>

1 November 2019

Peter Utnes

Philosophiae doctor

Exploring the landscape of high-risk neuroblastoma using next generation sequencing and bioinformatics

Neuroblastoma is the most frequent extra-cranial solid tumor in childhood representing 7-8 % of all pediatric malignancies and 15 % of childhood cancer deaths. Although many scientific breakthroughs have been made with the use of new treatment strategies and technological advancements, high-risk neuroblastoma still exhibit poor prognosis and thus requires continued efforts to further enhance our understanding of this devastating childhood disease.

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27 September 2019

Qiongjie Zhou

Philosophiae doctor

A novel risk classification system for preconception health and sero-epidemiological map of Toxoplasma, Rubella and Cytomegalovirus infections among couples planning a pregnancy in rural China: A nationwide study

The Free National Preconception Health Care Project has been conducted in rural China since 2010. As the majority of pregnancies among married couples in China are planned, it provides a unique opportunity for promoting health before conception. A novel classification system was developed to group risk factors into five categories based on their amenability to modification, prevention and treatment: A-avoidable risk factors, B-benefiting from targeted intervention, C-controllable but requiring management during pregnancy, D-diagnosable prenatally but not modifiable before conception, X-pregnancy not advisable. The study validated this system using data collected between 2010–12 from 220 rural counties located in 31 provinces of mainland China. A total 2,142,849 couples enrolled, of which 1,463,266 (68.29%) had one or more preconception risk factor. Avoidable risk factors were more common among men compared with women (38.13% versus 11.24%). Preconception screening of mother-to-child transmittable infections, such as Toxoplasma, Rubella and Cytomegalovirus (TORC), may be useful to reduce the risk of intrauterine infection. Targeted screening of these infections followed by appropriate referral for diagnosis and treatment, as well as implementation of preventive measures, should be considered during the preconception period to reduce the risk of vertical transmission during pregnancy and childbirth.

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30 August 2019

Sergei N. Drachev

Philosophiae doctor

Oral health in Russian young adults: A study on determinants of dental health, dental anxiety, and oral health-related quality of life in medical and dental students in North-West Russia

In Russia, there is little information on oral health (OH) and factors associated with OH in young adults aged 18-25 years. This thesis investigated dental caries experience (decayed, missing, filled teeth – DMFT index), dental anxiety (DA), oral health-related quality of life (OHRQoL), and factors associated with these outcomes. A cross-sectional study included 474 medical and 333 dental undergraduate Russian students aged 18-25 years from the Northern State Medical University in Arkhangelsk, North-West Russia. A relatively high DMFT index, with a dominance of filled teeth, was observed. Older age, being a female, high subjective socioeconomic status, and skipping tooth-brushing were associated with a higher DMFT index. The DMFT index also increased among students who reported regular dental visits, and these students had lower odds of being in the dental caries-free group. The level of DA was higher in medical than in dental students. Associations between DA and being female, lower mother's education, poor OH behaviour, and poor OH were found. The study showed that OH affects students' quality of life. Female sex, rural place of childhood residence, poor self-assessed dental aesthetic, dissatisfaction with mouth and teeth, and a higher DMFT index, were associated with low OHRQoL. The study recommends that public health measures should focus on developing preventive strategies for dental diseases, promoting dental literacy, and motivating good OH habits to improve OH and OHRQoL in young adults in North-West Russia.

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29 March 2019

Thor Gamst-Klaussen

Philosophiae doctor

Three essays on measuring health-related quality of life: external and internal relationships of the EQ-5D-5L

The use of quality-adjusted life years (QALYs) as a commensurable health outcome measure has been encouraged by health authorities in many countries in order to aid decisions on healthcare priorities. A key methodological challenge is to estimate preference-based weights for valuing health-related quality of life. The objective of this thesis was to provide improved knowledge of the usefulness of such measures with an emphasis on the most widely applied EQ-5D. More specifically, the thesis aims to: i) develop exchange rates across the various preference-based health instruments in order to enable comparisons of health outcomes from interventions that have been assessed by different instruments (Paper 1); ii) develop algorithms that can predict EQ-5D values from scores on depression scales to enable conversion of depression scale scores to a generic outcome metric like QALYs (Paper 2), and; iii) explore the causal and effect nature among the dimensions included in the EQ-5D descriptive system to provide insights into the discussion on how the system might be improved and extended (Paper 3). The analyses are based on a large international survey (N = 7,933) including six countries and seven disease groups.

Page link to thesis: <https://munin.uit.no/handle/10037/14417>

18 January 2019

Tonje Elisabeth Hansen

Philosophiae doctor

The prevalence and possible risk factors of asthma in a subarctic child population. A study of asthma and allergy among schoolchildren in Nordland county

The 'asthma epidemic' has led asthma to become the most frequent chronic disease among children in developed countries. The prevalence of asthma and allergic diseases varies greatly around the world. This thesis is based on the results from the study 'Asthma and allergy among schoolchildren in Nordland county'. The overall aims were to investigate prevalence of asthma, allergic rhinoconjunctivitis (AR) and eczema in schoolchildren and identifying possible risk factors for asthma in children. The first part of the study consisted of a questionnaire-based survey including 4,150 children aged 7-14 years from randomly selected schools in Nordland county in 2008. In the second part of the study, children reporting asthma ever (cases) together with matched non-asthmatic controls were invited to participate in a case-control study. The results demonstrated an increase in the prevalence of asthma and AR ever in schoolchildren in the period 1985-2008, while the prevalence of eczema ever reached a plateau. Exploring possible risk factors showed that lower respiratory tract infections, AR and food allergy were most important in 2008, while repeated lower respiratory tract infections, atopic diseases in the family and urticaria ever had most impact in 1985. During the study period, increased average temperature may have led to a rise in pollen production and thereby the increased prevalence of AR. Thus, AR might have contributed to the increased asthma prevalence in the study population.

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7 May 2019

Audhild Høyem

Philosophiae doctor

Continuity of care for patients with long-term complex needs - implications for clinical hospital practice

This thesis investigates implications for hospitals' practices in realizing continuity of care for patients with complex or long-term needs, at the intersection between policy, practice, and patient experiences. This investigation was done in three qualitative studies: A discourse analysis of policy documents, an interview study with healthcare professionals, and an evaluative analysis of individual patient pathways using individual interviews. It was found that the Norwegian policies on coordinator roles in hospitals highlight ideals that resonate well with what patients want in terms of continuity of care. However, both patients and health-care providers experienced substantial challenges related to the realization of these ideals. To improve this situation, it is suggested that a pathway infrastructure is implemented for these patients, with structural requirements that still allow for variation.

Page link to thesis: <https://munin.uit.no/handle/10037/15401>

20 May 2019

Jan Torbjørn Mannsverk

Philosophiae doctor

The epidemiology of myocardial infarction. Trends in incidence, risk factors, severity, treatment and outcomes of myocardial infarction in a general population.

The study found an annual decline in heart attack by 3% between 1995 and 2010. This decline was largely driven by dramatic decreases in out-of-hospital sudden death due to probable heart attack as well as hospitalizations for major heart attack. Almost 70% of the decline in heart attack was due to changes in modifiable risk factors, the most important contribution being a reduction in cholesterol, which accounted for almost one-third of the decline. There was also a reduction in deaths among patients hospitalized for heart attack, partly explained by less severe disease in those afflicted, but also by a major improvement in treatment. The results indicate that population-wide changes in risk-factor levels have a large potential for reducing heart attack incidence in a population. The association between risk factors and out-of-hospital sudden death indicates that primary prevention by modification of risk factors will influence both incident nonfatal as well as fatal heart attack in populations.

Page link to thesis: <https://munin.uit.no/handle/10037/17042>

7 November 2019

Kjersti Mevik

Philosophiae doctor

Identifying and measuring patient harms. A study of measuring adverse events in hospitalised patients by the Global Trigger Tool record review method

Patient harms, or adverse events due to medical care, is a major global health problem. Identifying and measuring them are challenging. This PhD project aimed to improve the Global Trigger Tool (GTT) record review method to identify and measure patient harms. The method involves searching through randomly selected patient records for predefined triggers (situations) and corresponding adverse events by a review team. The study evaluated whether turnovers within review team, automatic trigger identification and increasing the sample size affected the rate of identified adverse events. The study concludes keeping one reviewer consistent, increasing sample size and using automatic trigger identification. As this method is in use in all Norwegian hospitals, these adjustments will reduce the review time and improve the quality of the results. With further development, the automatic trigger identification system could identify patients at risk in order to prevent patient harm from happening in real-time.



Photo: Elin Karlisnes

Page link to thesis: <https://munin.uit.no/handle/10037/15257>

24 May 2019

Ali Naseribafrouei

Philosophiae doctor

The prevalence and incidence of diabetes mellitus among Sami and non-Sami inhabitants of Northern Norway

Diabetes mellitus is a lifestyle-related disease affecting many people around the world. Research has shown that indigenous peoples are more prone to lifestyle diseases compared with majority populations. This thesis is based on data from the Health and Living Conditions Survey in Sami and Norwegian Settlements, the SAMINOR Study. The SAMINOR 1 Survey, conducted in 2002-2003 in 24 municipalities in Northern- and Mid-Norway, showed no ethnic difference in the prevalence of pre-diabetes or diabetes mellitus. However, the prevalence of both pre-diabetes and type 2 diabetes mellitus was shown to be significantly higher among Sami participants in the SAMINOR 2 Clinical Survey. Abdominal obesity, which was more prevalent among Sami subjects, could largely explain the observed higher prevalence of pre-diabetes and type 2 diabetes mellitus among the Sami. No significant difference between Sami and non-Sami subjects was found in the occurrence of new cases of diabetes mellitus in an eight-year period of follow-up.

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7 May 2019

Elena Evgenievna Roik

Philosophiae doctor

Epidemiology of cervical cancer and high risk of HPV infection with a focus on Arkhangelsk City and County, Northwest Russia

Human papillomavirus (HPV) is one of the most common sexually transmitted infections worldwide. It is also known as important risk factor for cervical cancer. This study wanted to find out whether there was a difference in the social and clinical characteristics of the patients with cervical cancer diagnosed with and without screening. We were curious if the risk factors associated with longer survival between these two groups were different. The Arkhangelsk region is an important area of study because it has high annual cancer rates. The Arkhangelsk Cancer Registry (ACR) has been established, which includes all cases of cancer in the region. The study indicates that women with cervical cancer diagnosed by screening were mostly older, had less aggressive tumour cell types, were in the earlier stages of the disease, and died less frequently from it. Diagnosis made within the screening program decreased the risk of death from cervical cancer. The study demonstrates that majority of women in Arkhangelsk had a sufficient level of knowledge about HPV and CC prevention. Women with positive HPV status group differed from the HPV negative group by age, marital status, parity, age at sexual debut, number of sexual partners and cigarette smoking. Women with early age at sexual debut and those nulliparous have had a higher risk of having a positive HR-HPV status. The importance of cervical cancer screening is affirmed by this research and wider use of it in the Arkhangelsk region is encouraged.

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25 January 2019

Magdalena Skowronski

Philosophiae doctor

'Will I get cancer again?'. An ethnography of worries, healing landscapes and sensation-to-symptom processes among people living in the aftermath of cancer in rural Norway

Today, 71% of those who are diagnosed with cancer live five years or longer after treatment. Although the level of mortality varies considerably between different cancer diagnoses, the total number of people who recover after cancer is increasing. There is a need to gain knowledge on how people who live in the aftermath of cancer treatment experience health and illness, bodily sensations, everyday life and relations to the health care system. The main goal of the project was to investigate how people who live in the aftermath of cancer treatment experience bodily sensations, make sense of and act towards cancer illness and health. This involved an exploration of the social processes and relational dimensions of sensations and care-seeking processes. The study builds upon 11 months of ethnographic fieldwork in 2014 in a rural context, located far away from specialist health care services, more specifically in a coastal village of fewer than 3000 inhabitants in the northernmost county of Norway. The study contributes to the understanding of living in the aftermath of cancer treatment in a rural context far away from specialist health care services. While the participants attempt to protect family members by avoiding sharing worries with them, they express the need to share their worries within friendships. The study enhances understanding of the social embeddedness of emotions in everyday life.

Page link to thesis: <https://munin.uit.no/handle/10037/15065>

29 April 2019

Evgeniya Sovershaeva

Philosophiae doctor

HIV-infection in children and adolescents in Zimbabwe: viral suppression, airway abnormalities and gut microbiota

Sub-Saharan Africa has the highest HIV burden in the world. Antiretroviral therapy (ART) improves survival by suppressing HIV in the blood. Data suggest that children living with HIV are prone to chronic lung complications. The study analyzed the factors that may contribute to the development of these complications. In Paper I, it was found that it is harder to achieve suppression of HIV in children. Moreover, even after virus was under control, relapses were more common in children than in adults. Paper II and III investigated the role of two components of the immune system; exhaled NO (eNO) and gut microbiota. The eNO level was affected by presence of HIV and previous tuberculosis. While HIV-infected participants had altered gut microbiome in general, ART had a positive effect on its composition. No association was found between lung disorders and gut microbiota. Children living with HIV presents a distinct challenge, and more resources should be directed to management of those patients.

Page link to thesis: <https://munin.uit.no/handle/10037/16909>

10 December 2019

Henrik Wählberg

Philosophiae doctor

Practical health co-operation – a cluster randomised study. The impact of referral templates on quality of care and health care co-operation between primary and secondary care.

The process of referral from the general practitioner (GP) to the hospital has, in principle, remained unchanged for years. The current PhD project aimed to examine the impact of an intervention designed to improve the clinical content of the referrals on the quality of care at the hospital. The fourteen GP surgeries located in the geographical area of the University Hospital of North Norway (UNN) Harstad were randomised to an intervention or control group. In the intervention group, referral templates for four separate referral groups were implemented. The referrals in the intervention group were significantly better. This, however, did not improve the quality of care delivered to the patients or improve the prioritisation of patients. In addition, there was no difference in patient experience between the two groups. Hence, the current study showed improvement in referral quality following the referral intervention, but no significant change in patient experience or quality of care. Based on this study, broad scale implementation of referral guidance could not be recommended before more stringent assessment has shown it to be useful in clinical practice.

Page link to thesis: <https://munin.uit.no/handle/10037/17094>

17 December 2019

Inger Johanne Dagsvold

Philosophiae doctor

Cultural adaption of mental health services to the Sami. A qualitative study on the incorporation of Sami language and culture into mental health services.



The Sami indigenous people in Norway have a statutory right to receive equitable health services, adapted in accordance with Sami language and culture. However, there is limited research on the impact of culture and how to provide culturally and linguistically adapted mental health services to Sami patients. This thesis aimed to explore the significance of culture and language in mental health care as experienced by clinicians and Sami patients. The study is based on thematic analyses of individual interviews with clinicians and Sami patients in mental health clinics in Northern Norway. The results indicate that the integration of language and culture into mental health care is a complex process, dedicated to the clinicians. This process involves strategies at three levels; institutional systems and structures, clinicians' cultural assumptions

and analytical competence, and cultural assessment of interventions within mental health treatment. There were limited team discussions about the impact of culture on mental health care. Stereotypical portrayals of Sami culture dominated, delimiting the identification of Sami-speakers and simplifying or ignoring possible impacts of culture on mental health care. The important question is not what Sami culture “is”, but how cultures unfold in therapeutic encounters within mental health care services.

Page link to thesis: <https://munin.uit.no/handle/10037/16468>

18 October 2019

Photo: Inger Johanne Dagsvold

Marianne Eliassen

Philosophiae doctor

Physiotherapy practice in reablement services. A qualitative study with observations and interviews

Reablement is a community-based health care service aiming to enable people with (or those at risk of) functional decline to stay independent in their own homes. The service entails short-term, goal-oriented interventions provided by an interprofessional team. Support personnel, referred to as home trainers (HTs), mainly conduct the treatment initiatives under supervision of professionals including physiotherapists (PTs), occupational therapists, and nurses. This dissertation explores how the new organization of reablement may challenge traditional physiotherapy professionalism. The study revealed large variation in the practices of Norwegian reablement teams. Teams with a fixed division of labor provided limited assessments and supervision and used nonspecific approaches. Teams with a flexible division of labor provided thorough assessments, regular supervision and user-tailored interventions. Physiotherapy practices with fixed structured teams were characterized by mechanical labor, limiting individualization and contextual adaptations. In flexibly structured teams, PTs utilized their traditional professional competence and extended their practices towards a broader and more holistic perspective due to interprofessional collaboration. This work serves as a framework for the practical performance of reablement including team collaboration, assessment, supervision and training intervention.

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10 October 2019

Elin Kristin Evensen

Philosophiae doctor

Overweight/obesity, body composition and bone mass in late adolescence: the relation with birth weight, childhood body mass index and growth. The Tromsø Study: Fit Futures, a longitudinal cohort study

High prevalence of childhood overweight/obesity is a major health concern due to related immediate and long-term health problems. The aim of this thesis was to study how early life factors such as birth weight, childhood body mass index (BMI, kg/m²) and growth were related to overweight/obesity, body composition and bone health in adolescence. The Tromsø Study, Fit Futures (TFF), is a population-based cohort study with participants from Tromsø and neighbouring municipalities, conducted in 2010-2011 (TFF1) and 2012-2013 (TFF2). Data from a representative sample of 961 adolescents (48% girls) from TFF1, of which 659 had follow-up data from TFF2, formed the basis for this thesis. The prevalence of overweight including obesity increased with age and 21% of girls and 28% of boys were overweight/obese at 18-20 years of age. The study found a modest association between birth weight and overweight/obesity at 15-20 years of age. The degree of tracking of BMI from childhood to adolescence was moderate, with stronger associations observed for more severe overweight/obesity. Overweight/obesity at 6.0 and 16.5 years of age, as well as greater BMI gain between 6.0 and 16.5 years of age, were strong predictors of higher fat mass index (kg/m²) and central overweight/obesity at 15-20 years of age. Early identification of children at risk of adverse levels of adiposity is possible and preventive efforts should focus on a healthy weight development. Both early childhood and adolescence are important ages for preventive efforts.

Page link to thesis: <https://munin.uit.no/handle/10037/14589>

7 February 2019



Photo: Colorbox

Eirik Lind Irgens

Philosophiae doctor

Ambiguity and professional accountability in physiotherapy practice. Acquired brain injury rehabilitation across health care levels

The Norwegian Coordination reform, initiated in 2012 to improve coordination and reduce costs, has led to earlier hospital discharge and increased municipal responsibility for rehabilitation. This study explored the physiotherapy practice in acquired brain injury rehabilitation. Physiotherapists in both hospitals and municipalities were interviewed regarding the rehabilitation processes, and observed during physiotherapy treatment. The physiotherapists experienced dilemmas regarding limited resources and a challenging context in the municipalities. Balancing the resumption of everyday life and regaining function affected the prioritization of the physiotherapists. Physiotherapists may further develop their practices by closer and bidirectional cooperation across health care levels and organizational contexts, increasing attention to the effects of health care organization and politics on physiotherapy practice, and further developing arenas for communication and clinical collaboration.

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10 September 2019

Andreas Falck Lahelle

Philosophiae doctor

Group-based and individualized physiotherapy for persons with multiple sclerosis - A qualitative observational and interview study

Group-based organization is a common approach in physiotherapy for persons with multiple sclerosis, although it is a complex practice and sparingly investigated. This doctoral project aims to identify factors that challenge and give opportunities for achieving success in such clinical encounters. Through analysis of 56 hours of qualitative video observations and interviews, the study revealed that hands-on techniques and specific adaptations were vital to improve each group members' individual problems. The group setting occasionally challenged the clinical encounter, but mostly gave the patients additional opportunities to learn from each other's unique experiences. To obtain these opportunities, the physiotherapists combined their theoretical knowledge with practical and interactional skills. The study's findings contradict previous views of individual and group organization as mutually exclusive in physiotherapy, and suggest that individualization can be embedded in group settings.

Page link to thesis: <https://munin.uit.no/handle/10037/16688>

11 November 2019

Jill-Marit Moholt

Philosophiae doctor

Utilization of community healthcare services and family caregivers' needs for support

The majority of older persons with dementia live in their own home. Although a range of community healthcare services is available to support persons with dementia, family caregivers provide substantial care. This cross-sectional study includes 430 family caregivers of older, home-dwelling persons with dementia in Northern Norway. The study contributes to knowledge regarding the utilization of community healthcare services and assessment of family caregivers' needs. The use of services varied, and some variations were unintended, e.g., that persons with dementia living in rural areas used fewer services than those living in urban areas. Several services were used to a limited extent. In addition, several family caregivers reported substantial needs for the unused services. The study indicates that municipalities should evaluate the information about services and promote the advantages of using services. In addition, healthcare services should be adapted to the families in accordance with their needs.

Page link to thesis: <https://munin.uit.no/handle/10037/16707>

21 November 2019

Marit Sørvoll

Philosophiae doctor

Supervision in pediatric physiotherapy: an ambiguous distinction between treatment and supervision. A qualitative explorative study using observations and interviews

Supervision of non-professionals has become an integrated part of current practice in pediatric physiotherapy in primary health care. Limited knowledge exists regarding the content, organization and achievements of such practice. In this doctoral project, I explored supervision in the field of physiotherapy services for preschool children with CP who have a personal aide responsible for the daily follow-up under the supervision of a physiotherapist (PT). I aimed to identify characteristic features for supervision as a clinical practice and collected data via video-recorded observations of supervision sessions, observations and video-recorded sequences of aides' workday and individual interviews with PTs and aides. The results demonstrated that supervision in pediatric physiotherapy comprises temporal and transformative processes of knowing that extend beyond the mere linguistic. PTs perceived supervision as a complex process due to the many contingencies that occurred and transformed their professional jargon into everyday language to enhance the aides' understanding. In addition, the PTs used three supervision approaches, in which the PTs addressed both the child and the aide in a combination of dyadic and triadic interactions. The aide's work is also characterized by temporal and transformative processes, emphasizing that the application of knowledge is not a mere transfer of knowledge within and between contexts; aides transformed insights rather than applied them directly.

Page link to thesis: <https://munin.uit.no/handle/10037/15259>

23 May 2019

Yakubu Princely Abudu

Philosophiae doctor

Roles of SAMM50 and NIPSNAP Family Proteins in Mitophagy

The PhD thesis work of Yakubu Princely Abudu carried out in the Molecular Cancer Research Group, guided by Professor Terje Johansen, addresses both basal- and stress-induced mitophagy. In this study, it is demonstrated that the mitochondrial proteins, NIPSNAP1 and NIPSNAP2 act as “eat-me” signals for removal of damaged mitochondria by mitophagy. The NIPSNAP proteins tag the outside of damaged mitochondria to signal to the renovator crew (the selective autophagy receptors). While we have some knowledge about the mechanisms of stress- or damage-induced mitophagy, little is known about the mechanisms of basal mitophagy. In this study, it is shown that the mitochondrial protein SAMM50 mediates basal mitophagy through recruitment of ATG8 family proteins and the autophagy receptor p62. This enables the replacements of parts of the mitochondria required for their energy production without degrading whole mitochondria. The findings represent important contributions to the understanding of how cells carry out quality control of their mitochondria and destroy damaged mitochondria that can harm the cells. This knowledge has implications for aging, neurodegenerative diseases and cancer.

28 March 2019

Linn Samira Mari Evenseth

Philosophiae doctor

Ligand binding and dynamics of the GABAB receptor Venus flytrap domain

One of the most important neurotransmitters in the central nervous system is called gamma-amino-butyric-acid (GABA). GABA binds to three important receptors; GABAA, GABAB and GABAC receptors. The GABAB receptor is associated with a numerous neurological and neuropsychiatric disorders, but there is only one drug on the market that targets this receptor. This study used computer-based methods to screen virtual libraries to identify new potential drug candidates that can bind to one of the binding sites in this receptor. It also performed a computer-based simulation of the receptor to try to understand how it behaves in its natural environment. The current results show that we have two new compounds that can bind to the receptor.

Page link to thesis: <https://munin.uit.no/handle/10037/17041>

15 November 2019

Charles Walquist Johannessen

Philosophiae doctor

Expression and functional properties of selected miRNAs in human cancer tissue and cancer cell lines

MicroRNAs (miRNAs) are small ribonucleic acids (RNAs) involved in the regulation of genes, and they are often dysregulated in cancer. It is of great interest to study these RNAs to better understand how they work and what they do in the body. Based on a large miRNA screening, which included samples from 108 breast cancer patients and 44 samples from healthy people, this study was able to identify several miRNAs that were expressed differently in cancer patients compared to healthy patients. Three different miRNAs, which are named miR-143, miR-145 and miR-126, were selected. Interesting discoveries were made when investigating these miRNAs, both in regard to their functions on cells in the laboratory, and when analyzing their distribution and abundance in patient samples with different levels of cancer. This work adds new knowledge into the complex function and regulation of these miRNAs, and it contributes to a fuller understanding of these important gene regulators.

Page link to thesis: <https://munin.uit.no/handle/10037/15195>

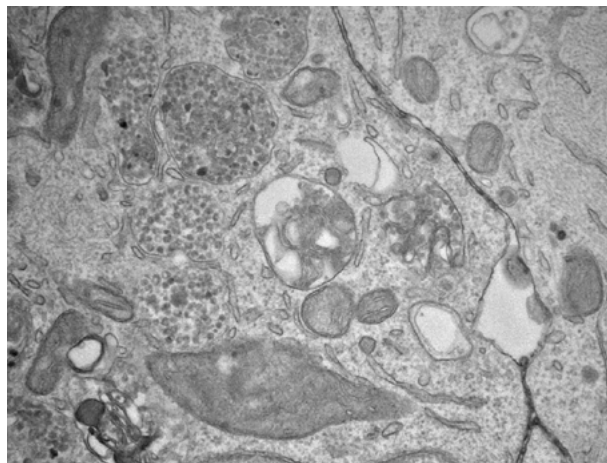
1 March 2019

Aelita Gloria Virginia Konstantinell

Philosophiae doctor

Biomarkers Discovery: The Benefit of the Study Exosomes Originated from Merkel Cell Carcinoma Cell Lines

Merkel cell carcinoma (MCC) is a rare, aggressive neuroendocrine form of skin cancer with a rising incidence and a high mortality rate. The risk of developing MCC increased among a large number of immunosuppressed patients. The origin of cancer is not known and the pathogenesis of MCC is not fully understood. Two causes can initiate MCC tumorigenesis: 1) accumulation of UV-induced mutations in the Merkel cell polyomavirus (MCPyV)-negative MCCs and 2) MCPyV-encoded genes in MCPyV-positive tumor. Approximately 80% of all MCCs are positive for viral DNA of MCPyV. This dissertation is the result of comparative and integrated analyses of proteins and microRNAs (miRNAs) profiling of polyomavirus-negative and -positive Merkel cell carcinoma (MCC) lines and their exosomes. It also discusses the potential application of exosomes, proteins and miRNAs as biomarkers for the diagnosis, progression, and prognosis for MCC. In this study data was generated and stored in publicly available repositories for further screening and validation studies. This project confirmed the benefit of exploring MCC cell lines as a model system for MCCs, and proteomic and sequencing approaches are potent tools for biomarker discovery.



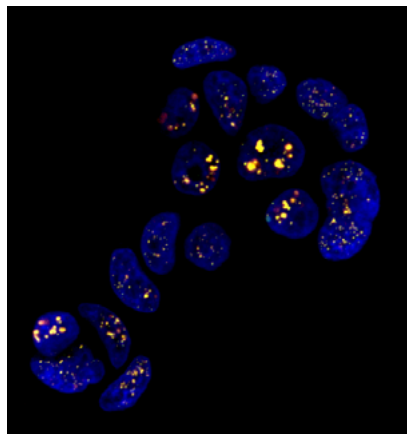
Page link to thesis: <https://munin.uit.no/handle/10037/16149>

30 August 2019

Seyed Mohammad Lellahi

Philosophiae doctor

Breast cancer associated NEAT1 in cellular stress response pathways



NEAT1 has a key role in protecting cells against stress and has an abnormal expression in breast cancer. The long noncoding RNA NEAT1 was discovered in 2007, and it is now clear that it has an abnormal expression in cancer cells and in nerve cells in patients affected by severe neurodegenerative diseases. NEAT1 is necessary for the formation of structures in the cell nucleus called paraspeckles. Paraspeckles can bind certain proteins and mRNA molecules and thereby regulate the expression of specific genes. In this work, I have studied the role of NEAT1 in mechanisms that are activated in cells when exposed to stress such as heat shock. I have been

particularly interested in finding out whether NEAT1 can be involved in autophagy in which damaged proteins and organelles are degraded so that the building blocks can be reused. My reason for doing this is to understand the role of NEAT1 in the development of cancer. The main focus has been on breast cancer and I have mapped the expression pattern of NEAT1 in various subtypes of breast cancer.

Page link to thesis: <https://munin.uit.no/handle/10037/15809>

13 June 2019

Tina Myhre Pedersen

Philosophiae doctor

Cardiac remodelling in obesity- and angiotensin II-mediated heart failure: Morphological, functional and metabolic alterations

In heart disease, the ability to adapt to the available substrate supply is reduced, leading to energetic imbalance and inefficiency, and subsequent heart failure. Cardiac metabolism may thus be a target for new treatment strategies, particularly in obesity and diabetes. This thesis describes that the use of multiple techniques is valuable when assessing function in hearts from obese mice. Additionally, although chronic elevation of circulating fat contributes to failure, the study shows that obese hearts also undergo adaptation, making them less sensitive to an acute fat exposure. The hormone angiotensin II also induces heart failure. While metabolic changes occur prior to dysfunction in obesity, this thesis describes that angiotensin II does not alter the substrate consumption prior to functional failure. This work elucidates changes in metabolism in two models of heart failure, thus improving our understanding of these processes, which is essential when developing new treatment strategies.

21 October 2019

Mehrdad Rakaee

Philosophiae doctor

Immune Infiltration and Clinical Outcome in Non-Small Cell Lung Cancer

In Norway, lung cancer is the second and third most common cancer in men and women, respectively. During cancer development, interaction between the tumor and its surrounding environment shapes the destiny of the tumor cells. Immune cells will in many cases inhibit tumor growth. Neutrophils, lymphocytes and macrophages are the most predominant immune cells in tumor tissues. This thesis aims to examine associations between these cells and clinical outcome of 553 non-small cell lung cancer patients. My work has revealed that patients with high tissue level of neutrophils (in squamous cell carcinoma histology), lymphocytes and macrophages (any phenotype including M1 & M2) exhibit improved cause-specific and overall mortality and have lower risk of disease progression. These results will be validated in an ongoing clinical trial aiming at implementation of the most promising immune markers in routine clinical practice. Ultimately, this will help physicians predict prognosis and improve treatment decisions.

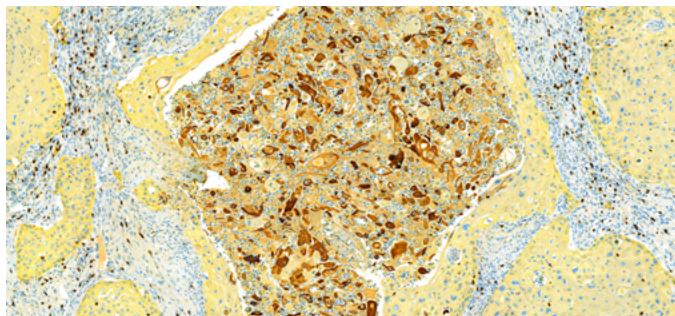


Photo: Mehrdad Rakaee

Page link to thesis: <https://munin.uit.no/handle/10037/14854>

12 March 2019

Birendra Kumar Shrestha

Philosophiae doctor

Regulation of Autophagy-related proteins: Roles of post-translational modifications

Autophagy is a self-renovation system used by cells to degrade harmful misfolded proteins and damaged organelles for recycling of essential building blocks in the cells. The dysregulation of autophagy is associated with cancer, infection, inflammation, aging, osteoporosis, neurodegenerative and metabolic diseases. Consequently, a better understanding of the autophagy pathway may help us design new drugs and therapies where autophagy is modulated to counteract major diseases. The study focuses on the effect of posttranslational modifications of LC3B and TP53INP2 and also investigates the molecular mechanism involved in ATG4B mediated cleavage and delipidation of the ATG8 family of autophagy proteins. The ATG8 family proteins are essential for the formation of autophagosomes and fusion of these with lysosomes. In this study, it is shown that phosphorylation of LC3B at threonine 50 affects its interaction with several essential autophagy-related proteins and negatively regulates selective autophagy. Selective autophagy is performed by autophagy receptors that can pick out the “garbage” that is to be degraded and recycled and ferry it to the autophagosome. The addition of lipid to ATG8 family proteins facilitates their binding to the autophagosomes. This study revealed the role of amino acid residues in the C-terminal region of ATG4B that mediates binding to the ATG8 family proteins to facilitate cleavage and delipidation.

Page link to thesis: <https://munin.uit.no/handle/10037/16322>

18 September 2019

Conny Tümmler

Philosophiae doctor

Novel Inflammatory Mediators in Neuroblastoma Tumorigenesis

Inflammation is an important part of the immune system's defence mechanisms against injury, infection, and malignant cells. However, cancer cells can also take advantage of inflammatory signals and processes to support their growth and avoid destruction by the immune system. The focus of this work was to discover novel inflammatory mediators in neuroblastoma, a cancer of early childhood. The first study describes how the multifunctional protein chemerin, and its receptor CMKLR1, can support neuroblastoma growth. The second study demonstrates that inhibition of SYK, a protein involved in transmitting signals inside the cell, could support the efficacy of conventional anti-cancer drugs in neuroblastoma. Interleukins are molecules that mediate communication between cells. The third study examines the role of the interleukin 17 family in neuroblastoma. This thesis contributes to understanding the biology of neuroblastoma, a prerequisite to develop new therapeutic approaches.

Page link to thesis: <https://munin.uit.no/handle/10037/17068>

20 September 2019

Armin Schniers

Philosophiae doctor

The proteome of ulcerative colitis - Functional analyses of the active disease and the remission state in comparison with healthy controls

This work elucidates the properties of human colon mucosa in ulcerative colitis (UC) on the protein level. UC is a chronic inflammatory disease that affects the colon and rectum. UC patients suffer from symptoms such as bloody diarrhoea and abdominal pain.

The study compared abundances of more than 8,000 proteins between patients with active ulcerative colitis, patients in remission from UC, and healthy controls. Distinct functional differences between these states was observed. The remission state presents with protein abundance characteristics of both active UC and healthy controls. Differences to healthy controls that persist in remission may contribute to relapses and symptoms that occur in this state.

The findings improve the understanding of UC and suggest new potential treatment approaches. The study presents a model to predict the disease progression, which could bring great benefit for clinical decision-making.

Page link to thesis: <https://munin.uit.no/handle/10037/15810>

18 June 2019

Iren Yeeling Wu

Philosophiae doctor

Development of osmotically active liposomes for nose-to-brain drug delivery

The brain as a drug target site remains a pharmaceutical challenge in spite of numerous efforts to enhance drug delivery to the brain. Nasal drug administration has gained interest among researchers, especially in the last decade, as it provides direct drug access into the brain. However, the nasal mucus and the surrounding environment often limit the use of nose as the administration site. Drug carriers such as liposomes have proven to be suitable to entrap a wide range of drugs protecting them from early clearance and degradation by nasal mucus, thus increasing the drug's potency even in small volumes applicable to the nose. However, the physiological condition of the nose, such as its tonicity, is an important parameter to consider when developing liposomal drug formulations intended for nasal administration. In this PhD project, liposomes composed of soy-phosphatidylcholine comprised of six anti-inflammatory drugs, entrapped individually, were proven to be osmotically active within nasal tonicity environment. Liposomes shrank or swelled when exposed to a hypertonic or hypotonic environment, respectively. With precise tailoring of liposomal composition, the liposomes' sensitivity to osmotic stress could be utilized to achieve controlled drug delivery within the nasal environment. The obtained data provide important information on the osmotic activity of liposomes and build the fundament for further development of innovative nose-to-brain drug delivery systems.

Page link to thesis: <https://munin.uit.no/handle/10037/17314>

22 November 2019

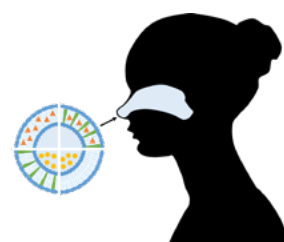


Photo: Private

Bjørn-Eivind Seljelid Bordewick Kirsebom

Philosophiae doctor

Dementia Disease Initiation: Identifying subjective cognitive decline (SCD) due to Alzheimer's disease

Alzheimer's disease is the leading cause of dementia and comprising between 50-75 % of cases. The biological underpinnings of Alzheimer's disease may begin 10 – 15 years before the disease manifests as objective deficits in cognition. Discovering disease markers at this early preclinical stage will increase our understanding of early disease mechanisms and hopefully lead to the development of interventions that can prevent, halt or stop disease progression. The experience of subjective cognitive decline is a known risk factor for Alzheimer's disease development. However, most cases are indeed benign and a part of normal aging. This thesis aimed to investigate the role of subjective cognitive decline as a preclinical stage of Alzheimer's disease. The study sought to improve early detection of at-risk individuals by investigating potential biases in participant recruitment methods, improve tools for assessment of memory performance, and investigate a new cerebrospinal fluid biomarker, the neurogranin/BACE1 ratio, which may be tied to synapse loss in Alzheimer's disease. Findings suggest that increased levels of this marker predict future cognitive decline and may point to the loss synapses as an early disease event. This finding could open possibilities for interventions aimed at preventing early synapse loss. Such future intervention could slow the progress of cognitive decline due to Alzheimer's disease.

Page link to thesis: <https://munin.uit.no/handle/10037/15234>

20 May 2019

Olivia Solene Le Moëne

Philosophiae doctor

Estrogenic modulation of socio-sexual and fear-related behaviors in female rats: Properties of the estrogen receptors α and β in a procedure with external validity

Sex is a significant risk factor in psychiatric troubles. The levels of circulating sex hormones could partly explain this. Estradiol, the main female hormone, binds to two receptors, estrogen receptor α (ER α) and estrogen receptor β (ER β). To unveil the differential role of ERs, I administered ER agonists to female rats in a first experiment. Then, I silenced the expression of either the ER α or the ER β in the ventromedial nucleus of the hypothalamus (VMN) or the central amygdala (CeA). Female rats were then submitted to a sequence of emotional challenges eliciting positive (lavender odor, chocolate pellets) or negative effects (fox odor, musical, white noise). My findings suggest that ER α in the VMN facilitated copulation in safe environments, and had anxiogenic properties in threatening situations. ER β had anxiolytic properties, partly acting through the CeA. These actions might not be opposite, but rather result from different information processing by distinct brain structures.

Page link to thesis: <https://munin.uit.no/handle/10037/16106>

6 June 2019

Øystein Robertsen

Philosophiae doctor

An Assessment of Factors Influencing Use of Respiratory Protective Equipment in the Norwegian Smelter Industry and the Effect of a Knowledge-based Intervention

This thesis investigated psychological factors thought to influence intention to use respiratory protective equipment (RPE), and reported RPE use in a sample of Norwegian smelter workers. A modified version of the Theory of Planned Behavior was compiled, and structural equation modeling was used to investigate how attitudes, subjective norms, perceived control, safety climate and work experience predicted intention to use RPE. Results indicated that attitudes and subjective norms and safety climate were the best predictors of intention to use respirators. An intervention study with two different intervention groups and one control group was designed, aiming to influence intention and use of RPE. The results revealed that participants in the two interventions groups showed small but significant improvements over the control group. The thesis concludes that attitudes, subjective norms and safety climate are important predictors of intention to use RPE, and that tailored and interactive interventions may increase knowledge, attitudes, subjective norms, intentions, perceptions of inconvenience and perceptions of organizational support regarding the use of RPE. In addition, the intervention effect was shown to maintain throughout the project period. There is evidence suggesting that the use of RPE can be sub-optimal in occupations with respiratory exposure.

Page link to thesis: <https://munin.uit.no/handle/10037/15258>

21 May 2019

Marte Rye

Philosophiae doctor

Attitudes to evidence-based interventions and routine outcome measures in mental health professionals

There is a major gap between the amount of resources spent to develop evidence-based treatment programs and interventions (EBI) in mental health care and the extent to which these interventions are used in real-life mental health care services. Embedded in the field of implementation science and through two online survey studies, this thesis explores factors that might influence the implementation of EBI in mental health care, including the use of routine outcome measures to get feedback on patient progress during treatment. The thesis has a special focus on mental health professionals' attitudes toward adopting EBI, the relationship between attitudes and organizational factors, and the development of implementation instruments. Results and implications discussed concern professionals' different levels of experience, perspectives and needs with regard to adopting an implementation initiative and its implications for the choice and design of training efforts and organizational support.

Page link to thesis: <https://munin.uit.no/handle/10037/15564>

20 June 2019

Olena Vasylenko

Philosophiae doctor

Manual dexterity in young and healthy older adults and its association with cognitive abilities

The topic of this thesis is how hand dexterity is affected by aging and cognitive decline. Proper hand dexterity is essential for our daily activities, but it usually declines with aging, restricting older adults' ability to function independently. Therefore, it is important to determine the exact nature of decline and what factors contribute to it. A novel method that consists of video recording and detailed analysis of hand movements was used. Results showed most decline in complex movements involved in object manipulation but less decline in fast, reaching movements. Successful performance depended on cognitive function in older adults but not in young. This implies that object manipulation is relatively automatic in young age but requires more effortful processes in older age. The findings are relevant for assessment of hand dexterity in research and clinical contexts, and for interventions aimed at prevention of functional decline in the older population.

Page link to thesis: <https://munin.uit.no/handle/10037/15428>

21 May 2019

Merete Aasheim

Philosophiae doctor

Young children with problem behaviour in school settings: Evaluation of the Incredible Years Teacher Classroom Management program in a Norwegian regular school setting

This thesis evaluates the effectiveness of the Incredible Years Teacher Classroom Management (IY TCM) programme in Norway, when implemented as a universal preventive intervention in a regular school setting targeting all teachers and students at the lower primary school level. Using a quasi-experimental pre-post comparison group design, reports from teachers in 21 intervention schools, participating in the IY TCM program (6 full-day workshops, 42 hours) were compared to reports from teachers in 22 comparison schools. A total of 302 1st to 3rd grade teachers and 1,518 pupils in the age of 6 to 8 years, took part in the study. Positive findings for change in pupils' social skills and problem behaviours, teacher-pupil relationship and teachers' involvement with parents were confirmed. This evaluation gives new knowledge of the impact of the IY TCM programme when given as a full-scale universal preventive intervention in regular school settings. The findings suggest potential preventive effects of the IY TCM programme and gives implications for future school practice with regard to improving the teacher-pupil-parent relationship and lowering the risk of future behavioural and social problems in schools.

Page link to thesis: <https://munin.uit.no/handle/10037/16148>

30 August 2019

Sabine Kaiser

Philosophiae doctor

Collaboration and service quality among health care professionals working with children and their families in Norwegian municipalities

There are many different professions and services that work with health in children, young people, and their families in municipalities in Norway. Poor collaboration between these various services and professions can be problematic. It can cause children not to get the help they need when they need it the most. On the other hand, collaboration and teamwork can also be viewed as job resources for the professionals that work in the different services. Job resources are characteristics of the job that support goal achievement and motivate and increase learning. This thesis aims at examining the importance of interprofessional collaboration and teamwork as job resources for professionals that work in health and social care services with a focus on professionals working in Family's House (coordinated services for families and children in municipalities) or family centres in Norway. Four different studies, with different aims, participants, and methodology, were conducted to answer different parts of the research questions. Overall, the thesis examines possible influences of collaboration (such as co-location), its relationship to individual outcomes (such as worker well-being) and to organizational outcomes (such as service quality).

Page link to thesis: <https://munin.uit.no/handle/10037/15225>

20 March 2019

Lene-Mari Potulski Rasmussen

Philosophiae doctor

Providing an indicated preventive intervention for children with symptoms of anxiety and depression: A study of effectiveness, implementation factors, and program fidelity

Anxiety and depression are among the most common disorders among children and adolescents, and even subclinical difficulties may lead to life-long consequences if they are left untreated. Preventing a further negative development is of utmost importance. However, implementing psychosocial interventions in real life settings is challenging. This thesis investigates the effectiveness, implementation factors and program fidelity related to the new intervention, EMOTION “Kids Coping with Anxiety and Depression”. In a national randomised controlled trial (RCT), which included 36 schools and almost 900 children (9-12 years), the intervention was delivered by trained child- and mental health professionals (N = 68). It was found that the intervention had positive results, where children in the intervention group (N = 266) reported less symptoms after the intervention compared to the control group (N = 443). There were, however, several issues to consider for further continuation of the program. Organizational factors, particularly related to time, resources and support from leaders, as well as focusing on how to most adequately assess program fidelity, need to be addressed.

Page link to thesis: <https://munin.uit.no/handle/10037/16299>

12 September 2019

Faculty of Humanities, Social Sciences and Education

Department of Archaeology, History, Religious Studies and Theology

Anna Afanasieva

Philosophiae doctor

Boarding School Education of the Sami People in Soviet Union (1935–1989): Experiences of Three Generations

If at one time researchers tended to romanticize indigenous communities, placing them outside of history, contemporary research is now becoming focused on the historical and social influences of particular relationships. This project analyzes the implementation and consequences of boarding school policies introduced on the Kola Sami people in Northwest Russia in the Soviet period from 1935 up to 1989. The study scrutinizes the mentioned processes from the point of view of its historical evolution, using



an interdisciplinary approach in relation to the existing knowledge on the topic. Through Sami oral accounts, archival documents, as well as Soviet, Russian and Western sources, the dissertation explores a series of rapid policy changeovers in the boarding school education of the Sami. Similar policies have been introduced in other indigenous communities and contexts, though in different states, time periods and geographical areas. The dissertation synthesizes systematic historical knowledge with an emphasis on socio-cultural information, contributing to a better understanding of the policies of assimilation in education of the Kola Sami and can be of value for a range of specialists devoting their studies to indigenous peoples of the Arctic and Circumpolar North.

Page link to thesis: <https://munin.uit.no/handle/10037/15101>

3 May 2019

Photo: Anna Afanasieva

Ola Goverud Andersson

Philosophiae doctor

The development of the local and regional historical research in Northern Norway and Northwest Russia in the period 1972–2015. A comparative historiography (Utviklingen av den lokal- og regionalhistoriske forskningen i Nord-Norge og Nord-Russland i perioden 1972-2015. En komparativ historiografi)

This thesis is a comparative historiography of local and regional historical research in Northern Norway and Northwest Russia in the period 1972–2015. The analysed source material consists of local and regional historical accounts, written by historians at the universities of Tromsø, Murmansk and Arkhangelsk. The text analysis entails close reading of central texts from these three research traditions. Employing both diachronic and synchronic comparison, the author identifies both differences and similarities between these traditions. The distinguishing characteristics of these traditions are systematically analysed through observation of their 'central topics', 'central motives' and 'articulated and/or applied methodology and theory'. Additionally, this comparative historiography on research traditions in Tromsø, Murmansk and Arkhangelsk addresses questions concerning the unique tradition of cooperative projects between historians of Northern Norway and Northwest Russia that began in 1986. The contacts and common projects have to some degree interwoven the three research traditions, and the author therefore tests the hypothesis that the collaboration between the Norwegian and Russian historians in the North has facilitated exchange and the mutual influence of thematic orientations and analytical perspectives.

Page link to thesis: <https://munin.uit.no/handle/10037/16544>

5 December 2019

Stein Farstadvoll

Philosophiae doctor

A speculative archaeology of excess: Exploring the afterlife of a derelict landscape garden

This thesis studies the afterlife of Retiro, a derelict 19th-century garden located in the town of Molde. It explores the implications of seeing Retiro in its current ruinous and overgrown state, as heritage. This means extending heritage to things that would usually be omitted from conventional understandings, such as modern garbage and the non-native plants found there today. Data was gathered from repeated on-site surveys, during different seasons, and included such methods as photography and on-site description, seeking to highlight the unique aspects that emerge when things are left to their own devices. The concluding claim is made that approaches like the one developed through this research can contribute to an environmentally concerned contemporary archaeology. i.e. one that acknowledges how heritage is partly constituted by non-humans, e.g. plants, fungi, and plastic, and which is concerned with how material heritage is inherited by both humans and non-humans.

Page link to thesis: <https://munin.uit.no/handle/10037/15381>

14 June 2019

Liudmila Nikanorova

Philosophiae doctor

Religion and Indigeneity at Yhyakh

Each summer in the Sakha Republic (Russia), hundreds of thousands of people celebrate an event called yhyakh. This dissertation explores articulations, performances and translations of the concepts of 'religion' and 'indigeneity' at and around contemporary yhyakhs. It focuses on how yhyakh is understood and performed by its participants, on the motivations of the actors who promote yhyakhs, and on a variety of circulating narratives. The study is ethnographic in method and based on fieldwork at and around the Tuymaada Yhyakh and the Olongkho Yhyakh from 2016 to 2018. Scholars have categorized yhyakh as, for example, a 'shamanic ceremony', a 'religious ritual', and an 'indigenous festival'. My ethnographic material reveals a much broader variety of understandings of yhyakh. By exploring how yhyakh and its practices are translated towards and away from 'religion' and 'indigeneity', by scholars and a wide range of other actors, I show how categorizing are powerful acts with far-reaching effects.

Page link to thesis: <https://munin.uit.no/handle/10037/15960>

9 September 2019

Hilde Marie Brox

Philosophiae doctor

Why won't they take them on? A study on student teachers' first-time engagement with wiki technology

The topic of this dissertation is the use of wikis in teacher education. The study is based on two classroom interventions where student teachers wrote on wikis for the first time. Students of social studies created a Wikipedia article together, while students of Norwegian made their own fiction-based, class-only wiki. The study is concerned with how the student teachers engage with, make sense of, and assess the pedagogical value of wikis. Data was gathered through a survey, students' logs and response texts, individual interviews, field notes, and the wikis' records of user activities. The data shows that the students quickly master editing and discover how wikis like Wikipedia pages are created and maintained. Moreover, they begin to perceive technology in different terms. Popular, instrumentalist and determinist notions of technology are challenged as they begin to regard the wikis as socio-technical systems involving both human and technological agency. When interviewed, however, the students display reluctance towards "taking on" wikis in their own teaching and resort to more "received" notions of technology. The study adds to the research on pedagogical use of wikis and on factors affecting new teachers' uptake of new technologies. It concludes that teacher education needs to make room for more explicit theorisation about technology and its role and purpose in education. The versatility, complexity and transparency of wikis make them particularly suitable technologies for addressing such issues.

Page link to thesis: <https://munin.uit.no/handle/10037/16489>

15 November 2019

Siri Sollied Madsen

Philosophiae doctor

About ideals and realities in the use of digital technology in teacher education. A comparative study of teacher educations in Norway and New Zealand (Om idealer og realiteter i lærerutdannings bruk av digital teknologi. En komparativ studie av lærerutdanninger i Norge og New Zealand)

Compared to most other countries, Norway has been exposed to a stronger top-down implementation of information and communication technologies (ICT) in education. The pervasive change in the Norwegian school curriculum has consequently resulted in changes in Norwegian initial teacher education. Over 10 years have passed since Norwegian educational reforms mandated teachers' use of digital tools as a required basic skill in all subjects and at all levels of Norwegian schooling. However, government surveys show that there is still a significant gap between the aim of educational policies and what is actually practised in Norwegian teaching. This gap has often been attributed to deficiencies in practitioners' skills. This thesis aims to broaden the understanding of the established gap between policies regarding the use of digital technology and the actual use of digital technology in Norway. To understand this gap, a comparative study was conducted between teacher education in Norway and teacher education in New Zealand. These are two countries with quite different approaches to implementing digital technology in education, and we found several interesting differences between the countries.

Page link to thesis: <https://munin.uit.no/handle/10037/15209>

2 May 2019

André Rondestvedt

Philosophiae doctor

Vocational orientation and practical application of the core subjects (Yrkesretting og praktisk anvendelse av fellesfagene)

The drop-out rate in Norwegian vocational education is a major problem, both personally for those involved, and for society in general. The lack of relevance of the core subjects for vocations is mentioned as one of the reasons for the low completion rate. In this study, I examined the learning process methods and the integration of subject content when making the core subjects more vocational, based on the vocations' practical work tasks. The empirical selection of the study was three vocational college classes: first year electro trades, first year technical trades and industrial production, and second year transport trades. The college's internal documents have been analysed according to the work tasks' subject content, problem-based learning and group work. Observations have been made of pupils' actions at college that are related to the implementation of problem-based learning and group work in the more vocational core subjects. In addition, pupils and teachers of core subjects and programme subjects have been interviewed individually and in groups. I have also noted my own reflections as a researcher during the field work. The results of the study show a need for more vocational core subjects and the practical application of the core subjects. It is positive for pupils' desire to learn when the starting point is the pupils' practical actions with problems that are relevant for their vocation and work tasks in the college's workshops. The most significant was the core subject mathematics. The interaction in group work worked in both heterogeneous and homogeneous groups. However, a cooperative heterogeneous group composition is recommended for longer projects.

Page link to thesis: <https://munin.uit.no/handle/10037/16248>

17 October 2019

Yvonne Sørensen

Philosophiae doctor

To grip and be grasped - in order to comprehend. Student teachers' experiences of teaching practice and its role in professional development

This study investigates the importance of students' teaching practice for their professional development, by taking the students' perspective. It sets out to generate knowledge that may contribute to a more complete and nuanced view of student teachers' professional development. Professional development is in this context to be understood as a continuous and integrated process, which is both physical and personal, and at the same time social and contextual. The study investigates the reflections of student teachers on their experiences during their teaching practice. The data consist of ten interviews which are analysed. The analysis suggests that how the students experienced various aspects of their professional training has an impact on their professional development. Important factors here are how they were received and to what extent they were included at the practice school, their relationship with their practical training supervisor, the competence of their supervisor, the quality of the supervision, how the professional training was organized, and the relationship between the professional training and theory, as well as specific experiences. The study concludes that the students' teaching practice in general, and the specified aspects mentioned above, must be perceived as balanced to be experienced as meaningful and in order for it to promote, rather than limit, the students' professional development.

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Page link to thesis: <https://munin.uit.no/handle/10037/14947>

14 April 2019



Photo: Yvonne Sørensen

Gaute Barlindhaug

Philosophiae doctor

The Kids Want Noise - How Sonic Mediations Change the Aesthetics of Music

This dissertation focusses on how the development of new sound technology influences our understanding of which sounds are to be regarded as musical. A division there has always existed in our society between which sounds are considered to be appreciated as part of music and what is considered to be just noise. Historically, traditional instruments have been seen as the main source for such musical sounds. With the introduction of technology that could create sound independently of traditional acoustic methods, artists suddenly had a new possibility to explore sounds beyond the traditional musical framework. In this dissertation, I discuss not only how these artistic possibilities manage to create new sounds but, most importantly, make us re-evaluate our cultural expectation of how music should sound and how it is to be created.

Page link to thesis: <https://munin.uit.no/handle/10037/16097>

13 September 2019

Joe Stephen Collins

Philosophiae doctor

Neural Attractors and Phonological Grammar

What can language tell us about the inner workings of the brain? Linguists have known for a long time that there are rules governing the way we combine sounds in words and sentences. But why are those rules the way they are? This thesis argues that the rules themselves are a product of the dynamics of our brains, and the way we retrieve and combine the sounds of speech.

Page link to thesis: <https://munin.uit.no/handle/10037/16447>

18 October 2019

Åsne Øysteinsdotter Høgetveit

Philosophiae doctor

The Moral Vertical in Russian Cinema: Female Pilots, Flight Attendants, Cosmonauts and Aliens

This dissertation explores female characters in Russian cinema. The point of departure is the widespread understanding of films as cultural products – products that use cultural themes and motifs to communicate. The female characters presented have a strong connection to aviation and outer space exploration, through their occupations as pilots, flight attendants or cosmonauts, or their origin as otherworldly creatures. Thirty-two films released between 1924 and 2017 are analysed using theories of societal space, cultural studies and gender studies. The discussion centres on these characters' performance as women, what their plot function is, and which opportunities they have in a given space. On the basis of this discussion, it is argued that there is a 'Moral Vertical' in Russian culture – a moral hierarchy expressed in spatial terms, both visually and verbally, where women are superior to men. This dissertation is a contribution to our understanding of women's function in Russian culture and society – past and present.

Page link to thesis: <https://munin.uit.no/handle/10037/15263>

16 May 2019

Ellen Marie Jensen

Philosophiae doctor

Diasporic Indigeneity and Storytelling Across Media: A Case Study of Narratives of Early Twentieth Century Sámi Immigrant Women

By 1910 there were over 1 million Norwegians living in North America; among them was an unknown number of Sámi who also made their way across the Atlantic in the early 20th century. This study makes visible the hidden story of Sámi immigration through the life narratives of five Sámi women who also migrated to North America. The five women came from the Norwegian side of Sápmi, three of the women settled in Minnesota and two settled in Alaska. The stories take shape through the voices of the American grandchildren, relatives, and associates of the five women. Stories were shared alongside family photos or other family material culture. This work also forms part of an extended collaborative project using Indigenous approaches in research and writing, an approach where results are co-shared with communities in accessible ways. The intention of the author and grandchild storytellers is to publish the narratives in a general audience book with a corresponding multi-media platform.

Page link to thesis: <https://munin.uit.no/handle/10037/15353>

15 May 2019



Photo: "Laplander" – The New York Public Library Digital Collections.

Dorottya Bogнар-Lahr

Philosophiae doctor

Navigating between freedom of navigation and coastal State jurisdiction: An analysis of Russia's participation in the negotiation of the IMO's mandatory Polar Code, 2009-2015, from a deliberative theory framework

Increase in human activity in polar areas, which relies heavily on navigation, comes with unique challenges and risks due to remoteness and harsh environmental conditions. Therefore, the International Maritime Organisation has developed the International Code for Ships Operating in Polar Waters (Polar Code), a new set of mandatory regulations that aims to enhance ship safety and environmental protection in Arctic and Antarctic waters. The research topic of this doctoral degree is the negotiation of the Polar Code between 2009 and 2015, placing one key Arctic actor in its focus: the Russian Federation. It contributes to our understanding of Russia regarding international decision-making in the field of Arctic shipping. Russia is pulled between the two competing principles of the law of the sea: It emphasised coastal State jurisdiction focusing on its rights to introduce unilateral regulations above the Polar Code for its Arctic waters, while it prioritised freedom of navigation vis-à-vis environmental protection. This thesis also shows that States prefer to avoid discussion of such conflicting principles, preferring instead textual ambiguity and manoeuvring room for interpretation. Through interdisciplinary discussion, this thesis brings together the law of the sea and deliberative theory and suggests new ways the law of the sea may be interpreted and understood.

Page link to thesis: <https://munin.uit.no/handle/10037/16096>

26 September 2019

Trine Eide

Philosophiae doctor

Managing Marginality: the un/deserving Twa and the State of Rwanda

This thesis examines the Rwandan state's post-development complex by addressing the plight of a minority population, the post-foraging Twa. Constituting the poorest section of the Rwandan society, the official poverty classification system categorizes the Twa as a "historically marginalized people" making them eligible for various development schemes. Combining ethnographic fieldwork and historical sources to examine the roots of marginality and the deployment of current development schemes, the thesis focuses on the shifting dynamics between social stratification, stigmatization and state formation, arguing that both cosmological and developmental ideas of deservedness underpin the socio-political moral order to the disadvantage of the Twa.

9 December 2019

Bjarge Schwenke Fors

Philosophiae doctor

Border Performances: Politics, art and tourism where Norway meets Russia

This thesis explores performances on the border between Norway and Russia. Performance here denotes a wide range of actions and activities, from concerts and political speeches to guided tours and the raising of monuments. All these performances have one thing in common: They invest the border and the borderland with various meanings that so to speak “make” the border and borderland. Based on ethnographic research in and around the border town of Kirkenes, the thesis examines this meaning-making as it takes place within and across three fields: politics, art and tourism. It is argued that the border tends to be construed either as a bridge, marked by openness, unity and continuity, or as a barrier, marked by division, disunity and discontinuity. Correspondingly, the borderland is also invested with meaning, morphed into a place of great significance: A unique transnational space and a dramatic interface between East and West.

Page link to thesis: <https://munin.uit.no/handle/10037/14645>

25 February 2019

Jonas Stein

Philosophiae doctor

What Happened in Northern Norway? - A comparative and quantitative analysis of political and demographic development in Northern Norway from 1950 to 2015

This thesis is a quantitative analysis of various aspects of the political and demographic development in Northern Norway from 1950 to 2015 mainly by using the theoretical framework for the centre–periphery relationship, developed by Stein Rokkan, and by applying quantitative methodology. The first paper, “The Striking Similarities between Northern Norway and Northern Sweden,” uses a comparative perspective to find a very similar pattern of demographic development in municipalities in Northern Norway and Northern Sweden despite important differences in regional policies applied in the two countries. In the second paper, “The Centre–Periphery Dimension and Trust in Politicians: The Case of Norway,” Northern Norway serves as a case for exploring if there is a spatial dimension in trust in politicians that goes beyond the urban–rural dimension. The results produced when using the Rokkanian framework reveal lower trust in national and local politicians in Northern Norway than elsewhere in the country, despite controlling for performance, cultural, political, and socio-economic variables. The paper also shows how distance from the capital could replace the dummy variable *Northern Norway*. The third paper, “The Local Impact of Increased Numbers of State Employees on Start-ups in Norway,” examines the effect of regional policies particularly important in Northern Norway, the relocation of state employees, and the creation of regional universities. The relative number of state employees in a municipality seems unrelated to local growth. Universities, on the other hand, seem to stimulate regional development. *Theoretically*, the thesis adds new knowledge to the literature on political trust and to the literature regarding the effects of different forms of regional policies. Empirically, it adds new knowledge about the political and demographic development in Northern Norway. *Methodologically*, it exhibits the benefits of using quantitative tools to study a region that has mainly been studied qualitatively.

Page link to thesis: <https://munin.uit.no/handle/10037/16364>

8 November 2019

Faculty of Law

Lisa Mattea Elvevold

Philosophiae doctor

The Essence of Contract Interpretation. Theoretical Reflections on a Practical Phenomenon.

Norwegian contract interpretation theory is based on established truths. In short, over the last 100 years or so, authors have agreed on most of the doctrine of interpretation while arguing mainly about terminology. Aiming towards capturing the essence of contract interpretation, I decided to put these well-known truths to the test. Through slow theoretical reflections, and fine reading of leading contract theory authors, I came to find that there is only so much that can be said about interpretation of contracts – in theory. Such a concrete and practical phenomenon can only have practical and concrete solutions. Thus, we should not look for the rules of interpretation when we encounter a contract interpretation question; we should focus on the material that is subject to interpretation.

12 September 2019

Natalia Ermolina

Philosophiae doctor

The Law of Shared Hydrocarbon Resources and the Question of Shared State Responsibility for Environmental Harm Arising from Their Cooperative Management

This thesis deals with the law of shared hydrocarbons – a body of general rules of international law governing the management of two categories of shared, common hydrocarbon resources: (a) hydrocarbon resources situated in maritime areas of overlapping claims, and (b) hydrocarbon resources straddling maritime boundaries between neighbouring States. This thesis examines the rights and obligations of coastal States that share hydrocarbon resources. It also addresses the issue of shared State responsibility in the context of shared hydrocarbons with particular emphasis on harm to the marine environment originating from activities undertaken in cooperation with respect to these resources.

7 May 2019

Christina Jensen

Philosophiae doctor

The Norwegian Small Claims Procedure

This thesis aims to answer the following question: Does the small claims procedure in Norway contribute to achieving the goals of civil procedure in cases concerning claims of low value? Traditionally, the court proceeding has been too expensive and time consuming. The goal of the small claims procedure is to lower the costs of going to trial without setting aside the right to a fair trial. The aspects of the small claims procedure that are analyzed are firstly the judge's role in managing the case and giving the parties guidance. Secondly, the judge's possibility to deny the entering of further procedure acts into the process. Thirdly, the possibility of the judge to decide that the usually oral final hearing can be completed in writing instead. These questions have a close link to the limited preparatory stage in small claims cases and the fact that small claims cases usually have more self-representing parties. I have also looked to the small claims regulations in Denmark, Sweden and the EU. The conclusion of the thesis is that the Norwegian small claims procedure will help achieving the goals of the civil procedure in most cases. However, if the cases are of the difficult kind, there is a danger that especially the limited preparatory stage may cause the opposite effect. For example, will the judges' duty of giving guidance to the parties possibly be complicated by the fact that it is not accepted to have preparatory meetings?

23 May 2019

Bjørn Løvteit

Philosophiae doctor

Security rights in intellectual property

The main issues discussed in this thesis are how to create valid and enforceable security rights over intellectual property under Norwegian law, how to determine the scope of such security rights, and how to perfect such security rights in terms of creating third party effectiveness. In addition, the thesis deals with issues related to a secured creditor's extinguishing of older rights of third parties, enforcement issues, and issues related to the choice of law. The United Nations Sustainable Development Goals establish a clear link between innovation, technology and affordable credit. This link forms the basis for the topic of this thesis. Sound secured transactions laws related to intellectual property can have significant economic benefits, promoting the development and growth of knowledge-based businesses and generally increasing trade. Secured transactions are considered one of the most effective ways of gaining access to affordable loans.

15 November 2019

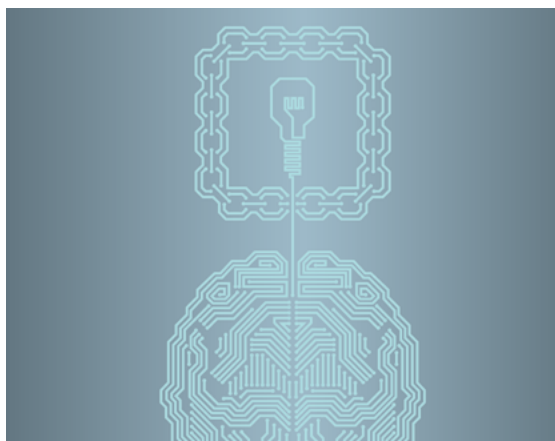


Photo: Bjørn Løvteit

Mona Martnes

Philosophiae doctor

The best interest of the child in expulsion cases and cases concerning residence permit on humanitarian grounds

The right of the child to have his or her best interests taken as a primary consideration is in its broadest form articulated in Article 3 no. 1 of the United Nations Convention on the Rights of the Child (CRC) and Section 104 (2) of the Norwegian constitution. The right applies in “all actions concerning children”, and thereat in cases concerning expulsion and residence permit on humanitarian grounds. I have examined the content and function of the right in such cases. The main research question in the thesis is when and how the best interests of the child can give a child and its nearest family a right to stay in Norway. The best interests of the child require that cases concerning a child are assessed from the child’s perspective. If it’s in the child’s best interests to stay in Norway, those interests may override arguments relating to general migration control.

13 November 2019

Jan Jakub Solski

Philosophiae doctor

Russian Coastal State Jurisdiction over Commercial Vessels Navigating the Northern Sea Route

This thesis analyzes the geographical scope and the substantive extent of Russia’s coastal State prescriptive and enforcement jurisdiction over commercial vessels navigating the Northern Sea Route (NSR). Melting sea ice, technological developments and the interests of States all stimulate human activity in the Arctic, including shipping. The NSR, located exclusively in Russian Arctic maritime zones, presents the highest potential for trans-Arctic shipping. Foreign navigation through the NSR is subject to a special legal regime. Russian domestic legislation stipulates that the navigation on the NSR – historically formed national transport line of communication of the Russian Federation – shall be carried out in accordance with international law. The United Nations Convention on the Law of the Sea (UNCLOS) sets out relevant rules of international law, including those relating to coastal State jurisdiction and navigational rights and freedoms of other States. Many of the Russian legal requirements exceed the extent of coastal State jurisdiction under the general law of the sea. UNCLOS, however, includes one important *lex specialis* – Article 234. This provision, a product of essentially private negotiations held in the 1970s among Canada, the USA, and the USSR, leaves exceptionally wide latitude to a coastal State within ice-covered areas. The thesis provides a careful analysis of Russia’s practice in regulating shipping on the NSR and confronts it with the rules of the law of the sea.

23 April 2019

Faculty of Science and Technology

Department of Chemistry

Marie-Josée Haglund Halsør

Philosophiae doctor

Along the path of bacterial nonulosonic acids. A study of the bio- and in vitro synthesis of sialic acid related compounds.

The surface of every cell is covered in a multitude of sugars of different types. One type, called nonulosonic acids, represents a diverse group of acidic sugars that are involved in many biological processes. In pathogenic bacteria for instance, nonulosonic acids are involved in their ability to infect hosts and evade their immune system. This study is interested in identifying new bacterial nonulosonic acids, but also in understanding how they are made within the bacterial cell. In order to reach these goals, the DNA of multiple bacteria was studied to find out which kind of sugar they produce. DNA related to nonulosonic acids codes for enzymes, proteins that can perform chemical reactions leading to these sugars. Some of these proteins were produced and crystals made of them in order to find their 3D structure. In turn, this knowledge will allow us to understand the chemical reactions those enzymes perform.

Page link to thesis: <https://munin.uit.no/handle/10037/16609>

25 October 2019

Miriam Khider

Philosophiae doctor

*Exploring Quorum Sensing Dynamics and Biofilm Formation in the Fish Pathogen *Aliivibrio salmonicida**

Bacteria that belong to the Vibrionaceae family can cause diseases in both humans and animals. *Aliivibrio salmonicida* belongs to the Vibrionaceae family and is the causative agent of cold-water vibriosis, affecting Atlantic salmon (*Salmo salar*), rainbow trout (*Oncorhynchus mykiss*) and captive Atlantic cod (*Gadus morhua*). The disease occurs mainly at late autumn, winter, and early spring when seawater temperatures are below 10°C. The early stages of the cold-water vibriosis lead to lethargy, swimming disturbances and cessation of feeding. Affected fish turn dark and exophthalmos may be seen. The cold-water vibriosis is also known as "Hitra disease" as it appeared for the first time in 1979 at Norwegian salmon farms close to Hitra island, south of Trondheim, Norway. Since then the disease was controlled by vaccination but reappeared in 2011 at Atlantic salmon farms despite vaccination. It is crucial to gain knowledge and understanding of the pathogenicity of *A. salmonicida*. Quorum sensing (QS) is one of the communication systems used by bacteria to regulate gene expression in a synchronized way in response to cell density by secreting and sensing extracellular signals called autoinducers (AIs). The results presented in this work add new knowledge about the nature of the QS mechanism of *A. salmonicida* and elucidate some aspects of the complex mechanism of biofilm formation, contributing to advancement of research in this field.

Page link to thesis: <https://munin.uit.no/handle/10037/16612>

22 October 2019

Bjørn Fjukstad

Philosophiae doctor

Toward Reproducible Analysis and Exploration of High-Throughput Biological Datasets

This dissertation argues that we can develop unified systems for reproducible exploration and analysis of high-throughput biological datasets. The study proposes an approach, Small Modular Entities (SME), that orchestrates the execution of analysis pipelines and data exploration applications. The study realizes SMEs using software container technologies together with well-defined interfaces, configuration, and orchestration. It simplifies the development of such applications, and provides detailed information to reproduce the analyses.

Page link to thesis: <https://munin.uit.no/handle/10037/14576>

21 January 2019

Einar Jakobsen Holsbø

Philosophiae doctor

Small data: practical modelling issues in human-model -omic data

Data derived from humans are very valuable in biomedical research. Access to human participants in research projects is limited by costs and ethical considerations. It is comparatively cheap to make many measurements of the participants we have recruited. Modern gene sequencing technologies enable us to take thousands to hundreds-of-thousands of measurements for the tens to hundreds of participants of a research project. This presents unique data analysis challenges. I explore these challenges and make guidelines for what I call the “small data” regime.

Page link to thesis: <https://munin.uit.no/handle/10037/14660>

8 February 2019

Fei Su
Philosophiae doctor

A distributed remote presence system masking the effects of delays in human-to-human remote interaction

This study present a multi-stage system for human-to-human live interaction across distance. The system masks the effects of delays and amplifies the remote presence of actors. It is designed to scale to at least three stages connected with both LAN and WAN (Internet). Each stage can have multiple actors. The study uses four 3D cameras per stage glued together to give approximately 360-degree coverage. Each stage also has at least one display. The system extracts a 3D recording of each actor. The system also sends data streams into the system for distribution between the stages. The data streams are analyzed on-the-fly for information such as gestures. Each stage receives several data streams and creates remote presences of the remote actors. The system applies several techniques to mask the effects of delays, including on-the-fly blending in of pre-recorded data streams or on-demand animations into the visualization of remote presences if delays prevent the data streams from arriving in time.

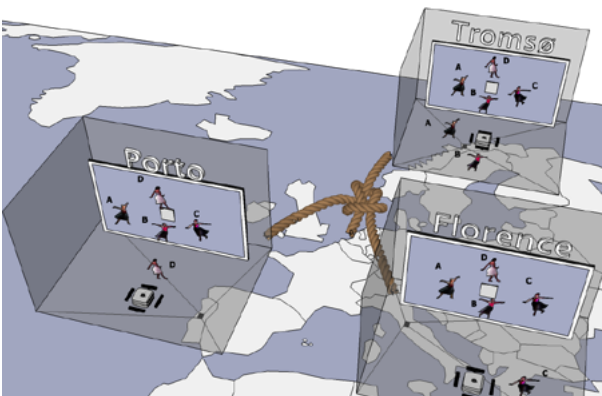


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Page link to thesis: <https://munin.uit.no/handle/10037/16614>

1 November 2019

Ngoc-Nha Vi Tran
Philosophiae doctor

Modelling Energy Consumption of Computing Systems: from Homogeneous to Heterogeneous Systems

Nowadays, improving the energy efficiency of computing systems becomes ones of the main research topics in computer science. In order to improve energy efficiency, it is important to understand how computing systems consume energy. Power and energy models provide prediction and insight into how computing systems consume power and energy. However, it is challenging to build accurate power and energy models that can be used for general devices and general applications. This thesis proposes three approaches of devising power and energy models, varying from homogeneous systems including one type of devices to heterogeneous systems including several types of devices with different architectures. The three approaches complement each other by targeting different types of computing systems and different objectives such as predicting accurate energy values, analysing energy complexity and choosing the most energy-efficient configuration in runtime.

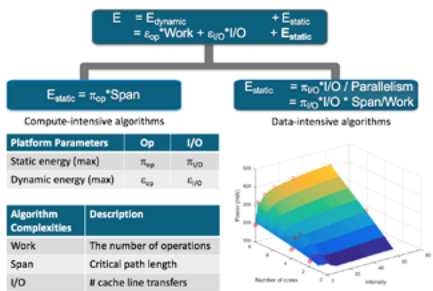


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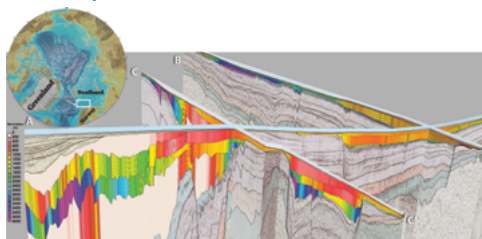
Page link to thesis: <https://munin.uit.no/handle/10037/16379>

6 September 2019

Dimitrios Ktenas

Philosophiae doctor

Quantification of the magnitude of net apparent erosion in the southwestern Barents Sea by using compaction trends in shales and sandstones – Implications for hydrocarbon exploration



On the Norwegian Continental Shelf, the western Barents Sea shelf is generally ice-free and proven by recent discoveries as a frontier area for hydrocarbon exploration. During the Cenozoic era most of the areas of the Barents Sea were subjected to significant uplift and erosion, processes that have had important consequences on the petroleum

systems. This thesis aimed to investigate the estimation of the net apparent erosion in the southwestern Barents Sea and consequently to determine the regional variation and magnitude of the net erosion by studying the compaction of selected stratigraphic layers. An integrated approach based on seismic interpretation of multi-client seismic data, shale and sandstone compaction combined with a rock physics application was used in order to estimate the amount of net apparent erosion in the study area. The findings will further serve as input to the overall understanding of the reservoir characteristics, the maturity of the source rocks, timing of expulsion and the retention of hydrocarbons in the traps.

Page link to thesis: <https://munin.uit.no/handle/10037/15222>

28 March 2019

Yulia Mun

Philosophiae doctor

Geochemistry of sediment-hosted copper deposits and their environmental impact: A case study from the Nussir and Ulveryggen deposits, Repparfjord Tectonic Window, Northern Norway

Modern growing economy and technology require metals and therefore mining is an unavoidable process. Mining in turn results in production of large amounts of mine waste. This research is focused on sulphide-rich mine tailings which is a slurry (mixture) of crushed rocks and water. The material is fine-grained which dramatically increases the rate of oxidation due to the increase in surface area. The Nussir deposit of Cu is located in a vicinity of the Ulveryggen and its production is planned in the near future. To better predict the factors that can trigger the oxidation of tailing that will be produced, thorough research on petrography, mineralogy, geochemistry has been done. In spite of the great vicinity of two deposits, the host rocks are different. Ulveryggen is composed predominantly by arkosic metasedimentary rocks while Nussir deposit is hosted by carbonate-rich lithologies. Silicates and carbonates have different buffering capacity to neutralize the acid. Thermodynamic modelling confirmed that redox potential controls the speed of sulphides oxidation, while pH is responsible in which species the metal, in case of this study Cu, will be mobilized. The results showed that in near-neutral-slightly alkaline conditions, the presence of carbonates will result in Cu mobilization and formation of $\text{CuCO}_3(\text{aq})$ complexes. This fact should be taken into consideration while choosing the AMD remediation scenario.

Page link to thesis: <https://munin.uit.no/handle/10037/16660>

7 November 2019

Calvin Shackleton

Philosophiae doctor

Subglacial hydrology of the Fennoscandian and Barents Sea ice sheets

Changes in global climate and ocean temperatures have caused thinning and melting of the world's ice sheets, and an increased rate of mass loss to the oceans. To determine how ice sheets will respond to future climatic changes, it is essential to understand the processes occurring beneath them. The flow of ice sheets towards ocean margins is partly controlled by meltwater at their base, which fluctuates between high and low pressure, and can be stored and released, with significant impacts on ice flow speed. This thesis uses glacial landforms to reconstruct past meltwater processes, and computer-simulated ice sheets to investigate drainage beneath ice sheets that once covered the Barents Sea and Fennoscandia. The study predicts potential locations for water storage, and reconstructs vast drainage systems beneath the past ice sheets, which give insights into possible structures and controls on meltwater drainage systems beneath present day ice sheets in Antarctica and Greenland.

Page link to thesis: <https://munin.uit.no/handle/10037/15815>

11 June 2019

Sunny Singhroha

Philosophiae doctor

Distribution and quantification of gas hydrates and free gas in marine sediments of Vestnesa Ridge, offshore W-Svalbard

Gas hydrates store a large amount of methane (>500 Gt of Carbon) in continental margins and permafrost environments. It is important to study gas hydrates as they have inherent resource potential and can affect climate if they dissociate and release methane into the atmosphere. Some of the Arctic gas hydrate deposits occur in climate sensitive areas. Gas hydrates occur extensively in the Vestnesa Ridge, a contourite drift deposit on the western Svalbard margin. This study examines occurrences of gas hydrates using different geophysical methods and techniques in the eastern segment of the Vestnesa Ridge, characterized by the presence of active seepages of gas (primarily methane) from pockmarks at the seafloor. This thesis also explores different geological factors that control gas hydrate distribution in the region.

Page link to thesis: <https://hdl.handle.net/10037/15824>

18 June 2019

Malin Waage

Philosophiae doctor

3D and 4D seismic investigations of fluid flow and gas hydrate systems

Methane gas and methane ice (methane hydrates) are common on continental shelves worldwide. This study investigates the mechanisms leading to methane flow beneath the seabed and its release to the water. It examines the sediments and sedimentary rocks of the Barents Sea using high-resolution 3D seismic data. Moreover, it introduces and tests a new method for monitoring methane migration below the seafloor - the 4D seismic. The method is based on acquiring identical 3D seismic data sets with time span of 1-2 years. The research shows that two studied methane release locations overlie shallow petroleum reservoirs. Tectonic faults favour methane migration from the deep, connecting the reservoirs to the seafloor. Some portions of methane were previously trapped in gas hydrates that melted some 20,000 – 15,000 years ago due to past climate change. The time-lapse investigations provide promising results of using the high-resolution 3D seismic system to reveal the dynamic nature of natural methane release sites.

Page link to thesis: <https://munin.uit.no/handle/10037/15078>

18 February 2019

Kate Alyse Waghorn

Philosophiae doctor

Scales of tectonic processes controlling fluid flow systems on the Svyatogor Ridge, Fram Strait

The Svyatogor Ridge is a subsea site on the flank of a divergent plate boundary where a gas hydrate system is studied. This system is unusual because, typically, on mid-ocean ridge flanks hydrothermal systems are common rather than gas hydrate systems. Methane generated in the deep crust through interactions between rock, gases and water (abiotic methane) is also relatively uncommon to find in gas hydrate systems. However, the Svyatogor Ridge may be one of the first documented gas hydrate systems sustained by abiotic methane. Faults, including plate boundary faults, are important pathways for methane moving through the subsurface. This thesis summarizes the relationships between scales of faults – from plate boundary faults to very small faults-, fluid migration and potential abiotic methane.

Page link to thesis: <https://munin.uit.no/handle/10037/15813>

13 June 2019

Aihua Lin

Philosophiae doctor

The EOS Formulation for Linear and Nonlinear Transient Scattering Problems

This thesis developed the EOS formulations of solving nonlinear transient scatterings, both for 1D case and 3D Maxwell's equations. This method can be accurately and stably implemented using one particular choice of numerical scheme for the inside of the objects and for the required integral representations of the boundary values. For a stable numerical solution, the time step needs to be confined in some range. The research has found that for 1D case, this range is determined by the internal domain-based method while for the 3D case, this range is both determined by the internal domain-based method and the boundary integral part. Specifically, in 3D case, the lower limit of the interval is highly depended on the properties of the materials, while the upper limit is determined by the internal domain-based method. This finding is believed to be related with the popular late time stabilities in the community of computational electromagnetics.

Page link to thesis: <https://munin.uit.no/handle/10037/15213>

29 March 2019

Karl Øyvind Mikalsen

Philosophiae doctor

Advancing Unsupervised and Weakly Supervised Learning with Emphasis on Data-Driven Healthcare

In healthcare, vast amounts of data are stored digitally in the electronic health records (EHRs). The EHRs represent a largely untapped source of clinically relevant information which, combined with advances in data science and machine learning, have the potential of leaping forward quality of care at an individual patient level. To this end, this study addresses challenges specific to healthcare data and develops novel machine learning methodology. Studies of anonymized patient data demonstrate how the proposed methods ultimately can lead to e.g. a reduction in the number of postoperative complications and better quality of life for patients with chronic diseases. This thesis brings us one step closer to the realization of data-driven healthcare in which healthcare, as we know it today, is assisted by autonomous monitoring systems as well as diagnosis and decision support tools based on data-driven approaches and machine learning.

Page link to thesis: <https://munin.uit.no/handle/10037/14659>

15 February 2019

Marthe Måløy

Philosophiae doctor

The nonlinear nature of biology

In this thesis, we explore the stability and breakdown of stability of biological systems. The main examples are the blood system and invasion of cancer. However, the models presented in the thesis apply to several other examples. Biological systems are characterised by both competition and cooperation. Cooperation is based on an unsolvable dilemma: Even though mutual cooperation leads to higher payoff than mutual defection, a defector has higher payoff than a co-operator when they meet. It is not possible to represent this dilemma with a linear and deterministic model. Hence, the dilemma of cooperation must have a nonlinear and/or stochastic representation. More generally, by using a linear model to describe a biological system, one might lose dimensions inherent in the complexity of the system. In this thesis, we illustrate that a nonlinear description of a biological system is potentially more accurate and might provide new information. We show that even though a new type of individual is in general not advantageous when it appears in stable population, the newcomers can grow in number due to stochasticity. Moreover, the new type can only become advantageous if it manages to change the environment in such a way that it increases its fitness. We also propose a model that links self-organisation with symmetric and asymmetric cell division, and we illustrate that if symmetric stem cell division is regulated by differentiated cells, then the fitness of the stem cells can be affected by modifying the death rate of the mature cells. This result is interesting because stem cells are less sensitive than mature cells to medical therapy, and our results imply that stem cells can be manipulated indirectly by medical treatments that target the mature cells.

Page link to thesis: <https://munin.uit.no/handle/10037/15214>

27 March 2019

Eivind Schneider

Philosophiae doctor

Differential invariants of Lie pseudogroups

Many interesting mathematical structures and physical phenomena are described as solutions to differential equations, and solving such equations is a task of great importance both in mathematics and physics. However, it may happen that different solutions describe the same mathematical structure, or the same physical phenomenon. Mathematically, this fact manifests itself as a group of transformations acting on the space of solutions, and we may say that two solutions are equivalent if there exists a transformation taking one solution to the other. By relying on the most recent developments in the theory of differential invariants, this work studies several differential equations with two main goals: determining when two solutions are equivalent and describing the set of equivalence classes. Relying on the mathematical theory and computer algebra systems, the study demonstrates utility of the algebra of rational scalar differential invariants for solving these two problems. The work contributes to the study of several important equations of mathematical physics, and it brings new insight into the general theory of differential invariants.

Page link to thesis: <https://munin.uit.no/handle/10037/15600>

10 May 2019

Tarjei Antonsen

Philosophiae doctor

In-situ Measurements of Mesospheric Aerosols - On the observable characteristics of nanoscale ice and meteoric smoke particles

This work describes the launch of two rockets during the MAXIDUSTY campaign in the summer of 2016. The rocket payloads comprised instrumentation aimed at analysing nanoparticles of ice and meteoric material in situ i.e where they occur naturally – at heights between 80 and 90 km in the summer mesosphere. The particles are elusive, and their role in many chemical and physical processes in the upper atmosphere is poorly understood. The successful MAXIDUSTY launches, which were supported by ground-based measurements, showcased new measurement techniques which can be used to measure sizes of ice particles at height resolution down to 10 cm. The work also presents a method for the estimation of the size distribution of meteoric smoke particles, which has previously only been modelled. Through comparison of rocket and radar data, it is found that the relationship between fundamental parameters of mesospheric nanoparticles and radar profiles is probably more complex than previously thought. The thesis also reports on a new phenomenon, Rare Low Summer Echoes, which are clouds visible for rockets and radars in the summer at heights from 67 to 78 km – well below what has previously been reported on.

Page link to thesis: <https://munin.uit.no/handle/10037/14521>

24 January 2019

Bilal Babar

Philosophiae doctor

Solar resource assessment at high latitude regions

Surface solar radiation estimates are used for planning and maintaining energy systems, such as photovoltaic panels or thermal systems. There is a growing interest in the deployment of these systems in Arctic regions, but accurate data for these regions is not available. There are only a few stations in the Arctic that record such data by dedicated equipment. However, remotely sensed data by satellites or by climate models can be used to estimate solar radiation. In this project, different sources for estimation of solar radiation are analysed. In the first part of this research, extensive validation for both satellite methods and climate models was performed for high latitude regions. It was seen that both of these sources deteriorate with increasing latitude. In the last part of this research, a novel dataset is presented which was constructed by using a satellite dataset and a climate model. The proposed dataset improved the solar radiation estimates at high latitude regions.

Page link to thesis: <https://munin.uit.no/handle/10037/15216>

22 March 2019

Katalin Blix

Philosophiae doctor

Machine Learning Water Quality Monitoring

Earth's water quality has been experiencing deterioration due to increased anthropogenic impact and climate change. Global waters can be continuously monitored by using satellite remote sensing technologies. However, there are several challenges in water quality monitoring from space. The large variations between aquatic environments often result in erroneous retrieval of water quality parameters from remotely sensed data. This work addresses these challenges by utilizing machine learning methods in Earth observation. Machine learning algorithms are studied and introduced for improving water quality retrieval. The thesis demonstrates the possibilities of using new algorithms and approaches to monitor waters, in cases where the traditional methods fail. The work also shows that machine learning algorithms can not only contribute to the improved understanding of the given approach, but also reveal the underlying biophysical processes in the water bodies.

Page link to thesis: <https://munin.uit.no/handle/10037/16502>

13 September 2019

Alena Dekhtyareva

Philosophiae doctor

On local and long-range transported air pollution in Svalbard

Climate change, health of the residents and ecosystems in the Arctic region are impacted by local and long-range transported air pollution. Local emissions in the Arctic are an important but overlooked issue. The scope of this work is to study temporal and spatial evolution of air pollutant concentrations in Svalbard using the historical chemical and meteorological data collected in Ny-Ålesund and newly obtained observations from three sites: Ny-Ålesund, Longyearbyen and Barentsburg. Remote and local emission sources, concentrations of anthropogenic short-lived climate forcers and environmental factors that promote long-range transportation and accumulation of local air pollution in the Svalbard settlements have been investigated. A strong seasonality in the concentrations of sulphur dioxide (SO₂), nitrogen oxides (NO_x), tropospheric ozone (O₃) and black carbon (BC) in Svalbard has been observed. In summer, the long-range transport of air pollution is limited, and local sources become more important. Indeed, ship traffic emissions in Longyearbyen and Ny-Ålesund promoted a significant increase in SO₂ and NO_x concentrations and slight decrease of the O₃ values. Measurements in Barentsburg revealed strong temporary deterioration of local air quality because of adverse weather conditions promoting transport of polluted air from the local coal power plant to the town.

Page link to thesis: <https://munin.uit.no/handle/10037/16297>

11 September 2019



Photo: Private

Martine Mostervik Espeseth

Philosophiae doctor

Analysis of Oil Spill and Sea Ice Measurements Using Full-Polarimetric and Hybrid-Polarity Synthetic Aperture Radar Data



Photo: David Jensen

Radar satellites have long been used to detect oil slicks and monitor sea ice. : Increased oil and gas exploration in the Arctic causes growing risks for oil spills. Increased numbers of satellites and different imaging techniques means understanding their performance is important to fully take advantage of them. This thesis investigates the potential and limitations of different radar instruments for monitoring oil spills and sea ice. Many parameters can be extracted from polarimetric radar data. This thesis compares and identifies the parameters' ability to detect

various types of oil. A new type of radar imaging mode has been launched over the past years. The study tries to understand how this new imaging mode works for sea ice and oil slicks, and promising results are reported. Identifying actionable thick oil is important during a recovery process, and the use of radar data for making maps of relative oil thicknesses is investigated.

Page link to thesis: <https://munin.uit.no/handle/10037/16973>

5 December 2019

Erkka Petteri Heino

Philosophiae doctor

Spatial extent of solar proton impact in the Earth's atmosphere - Observations and modelling

The accurate implementation of the spatial impact of solar proton events and other particle ionization sources in climate models is necessary to understand the role of energetic particle precipitation in natural climate variability. The spatial impact of solar proton events in the Earth's atmosphere is studied in this thesis by comparing the results of a climate model to observations of radio wave absorption, testing two models of proton access to the atmosphere with observations and modelling results, and employing a new method of using ionospheric high frequency radars. Based on the research presented in the thesis, the current solar proton event implementation in climate models significantly overestimates the solar proton impact area. Improving the implementation is recommended for future studies of energetic particle precipitation effect on the atmosphere and natural climate variability.

Page link to thesis: <https://munin.uit.no/handle/10037/16914>

18 December 2019

On-chip optical nanoscopy: towards high throughput and multi-modality

Super-resolution microscopy techniques improve the resolution of the optical microscope beyond the diffraction limit of light. A range of different techniques demands different optical configurations and clever illuminating strategies to enhance the resolution. This has led to the development of advanced instrumentation, where the super-resolution mechanisms are adding both cost and bulk to the microscope. Furthermore, super-resolution microscopes are bound by high numerical aperture optics, which produce convincing images, but lack throughput. A common feature of most optical microscopes is the sample glass/coverglass arrangement used to mount samples before and during imaging. These have traditionally been neutral devices where the properties of the glass itself have mostly remained unused. In this thesis, a new direction in super-resolution imaging is introduced, where the sample glass/coverglass is replaced with a photonic integrated circuit chip. The chip supports the sample in the same way as the glass/coverglass, and by using optical waveguides at the chip surface, the chip illuminates the specimen via evanescent fields. By using high refractive index waveguides together with different geometries, the chip can produce the necessary illumination for a range of different super-resolution microscopy techniques. Furthermore, by exploiting the waveguide properties, several of the imaging methods are improved over their conventional implementations. This comes as a consequence of separating the excitation and collection light paths for super-resolution imaging. In this work, chip-based single-molecule localization microscopy is demonstrated with a 100-fold increase in the field of view over conventional methods, and chip-based structured illumination microscopy is shown with a resolution beyond that of the objective-based implementation.

Page link to thesis: <https://munin.uit.no/handle/10037/16641>

7 November 2019

Marcel Lahrberg

Philosophiae doctor

Novel strategies for super-resolution fluorescence microscopy

The light microscope is a popular tool in life sciences to achieve insight in the structure and functionality of biological tissues and even cells, which helps to understand processes on the large scale. Modern microscopy in this area employs fluorescence imaging, a technique that enhances the contrast in microscopic imaging by marking structures of interest in a sample and highlights it in the image. The major advantage of light microscopy in this area is its minimally invasive nature. The sample can be imaged under conditions close to its natural environment, thus keeping its original structure and functionality to a certain extend. However, the resolution of optical microscopy is originally limited by the wavelike nature of light. Whether or not two close objects in a sample are spatially resolved, meaning that they are displayed as two distinct instead of a single object in the image, is governed by the diffraction limit. This diffraction limit is fundamental. Performing mirror based, as well as optical waveguide based, pattern generation is investigated in order to improve the resolution and field of view, using simulations. A simulation framework is presented that demonstrates the potential of those techniques. Finally, the capability of optical waveguides to perform beam shaping in order to provide well defined illumination patterns is examined. Appropriate parameters for the fabrication of such waveguides are derived.

Page link to thesis: <https://munin.uit.no/handle/10037/17093>

11 December 2019

Chia-Yun Lai

Philosophiae doctor

Quantitatively reinterpreting atomic force microscopy via the data science paradigm

This thesis explored two ambits of current interest in atomic force microscopy (AFM). The first part of this thesis has been dedicated to inspecting the force profile. The approach has shown that: 1) the “attractive” part of the force profile, typically explained as the short-range van der Waals force, does not necessarily follow an inverse square law. This point puts restrictions to high resolution imaging since the shape of the force becomes tip size dependent. 2) the procedure of recovering the force profile does not necessarily meet the conditions which allows assuming a normal distribution. The main consequence of this second point is that acquiring ~30 data points per pixel does not justify providing a mean and a standard deviation of a given parameter in order to account for errors. This first part of the thesis finishes with a machine learning approach to parametrizing the force. A disadvantage of this method is the increase of complexity in the computational side. The second part of the thesis is dedicated to recovering the parameter that is typically used to explain the van der Waals force interaction in ambient AFM, i.e. the Hamaker or H , while imaging. We assumed a power law of 2 and analytically derived an expression to recover H by exploiting the multifrequency method. We have shown that an analytical solution is available assuming certain experimental conditions. This approach allows for higher throughput and quasi-instantaneous recovery of the parameter while performing standard multifrequency imaging.

Page link to thesis: <https://munin.uit.no/handle/10037/16770>

22 November 2019

Van Nhan Nguyen

Philosophiae doctor

Advancing Deep Learning for Automatic Autonomous Vision-based Power Line Inspection

To maintain the reliability, availability, and sustainability of electricity supply, electric utilities are usually required to perform visual inspections on their electrical grids regularly. These inspections have been typically carried out using traditional methods (e.g., field surveys and airborne surveys), which are not only slow and expensive but also potentially dangerous. In this dissertation, I exploit recent advances in Deep Learning (DL), especially deep Convolutional Neural Networks (CNNs), and Unmanned Aerial Vehicle (UAV) technologies for facilitating automatic autonomous vision-based power line inspection. Specifically, I propose a novel automatic autonomous vision-based power line inspection concept that uses UAV inspection as the main inspection method, optical images as the primary data source, and deep learning as the backbone of data analysis. I then propose approaches for advancing deep learning for facilitating the implementation of the concept.

Page link to thesis: <https://munin.uit.no/handle/10037/16815>

3 December 2019

Taimur Rashid

Philosophiae doctor

Monitoring of Marine Ice and its Thickness for Ship Anti-/De-icing - Experimental and Analytical Study using Infrared Thermography

This study focuses on identifying, assessing and implementing a technique that could provide real-time information about marine ice accretion and its thickness on a surface in cold environmental conditions. In this regard, due to its particular advantages, such as non-contact measurement, area detection and the need for less observation time, infrared thermography (IRT) is used to remotely monitor the marine ice samples. IRT is used to measure the thickness of marine ice samples when subjected to heating from underneath. The laboratory experiments are performed at controlled atmospheric conditions, and marine ice thickness up to 15mm is tested. Furthermore, an electrothermal coating material is manufactured for implementing large-scale anti-/de-icing. This is achieved by using a roll to roll (R2R) coating process of carbon nanotubes (CNTs). The coating is manufactured on a meter-scale poly(ethylene terephthalate) (PET) sheet. This R2R CNT coating is characterized and demonstrated for anti-/de-icing purposes. A major finding of this study is that marine ice thickness has a strong correlation with the time taken to respond to the change in temperature, subject to heating being provided from underneath. Furthermore, a R2R CNT coating is successfully implemented on a meter-scale PET sheet, which shows linear current to voltage response. This electrothermal coating material can be used for anti-/de-icing of large surfaces.

Page link to thesis: <https://munin.uit.no/handle/10037/15215>

1 March 2019

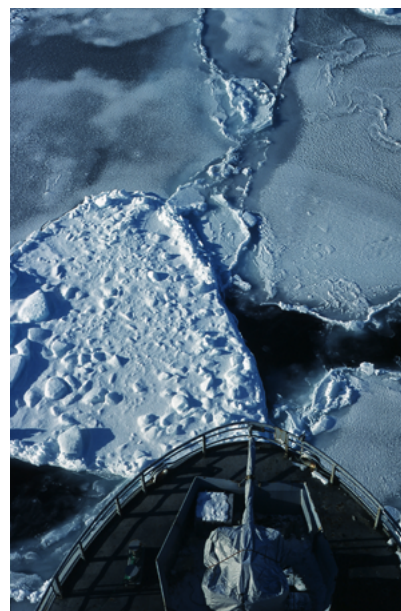


Photo: "Lance" by Jo Jorem Aarseth

The Arctic University Museum of Norway and Academy of Fine Art

Academy of Music

Anneli Drecker

The Norwegian Artistic Research Programme

The Modern Ancient Voice. Recreating and adapting the ancient voice.



In the artistic research project “The Modern Ancient Voice. Recreating and adapting the ancient voice” I have invented new singing techniques based on investigations of on ancient vocal and aesthetic expressions found in various other cultures. The term “ancient voice” in this setting refers to the voice as the first ever instrument within ancient societies, where song was a vital part of the human’s expression, cult and religion. The project has emerged from a need to understand these song techniques based on a cultural and geographical vantage point, which is the Arctic landscape that is essential to my assessment of other cultures and their modes of expression. Via observations during master classes with chosen mentors, musical co-operations and case studies of several ancient and traditional singing styles such as joik from Sàpmi, I have explored new aesthetic expressions and pushed my own artistic barriers. Rather than trying to achieve mastery of these ancient vocal styles, I have tried to recreate and adapt them to facilitate

and inspire the creation and composition of new music within the extended popular music field. The dissemination of the project includes a public presentation in form of a concert, several musical releases, a documentary film, and a critical reflection that establishes a framework for the artistic research.

Photo: Hans Petter Sørensen

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