Raymond Kristiansen

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Born in Finnsnes, Norway on January 12, 1977.

Raymond Kristiansen is professor in automatic control at the Department of Electrical Engineering, Faculty of Engineering Science and Technology, UiT The Arctic University of Norway (UiT Narvik). He graduated as bachelor of engineering in computer technology from Narvik University College (HiN) in 1998, and as master of engineering in engineering cybernetics from the Norwegian University of Science and Technology (NTNU) in 2000. He received his PhD degree in engineering cybernetics from NTNU in 2008 with the thesis “Dynamic Synchronization of Spacecraft: Modeling and Coordinated Control of Leader-Follower Spacecraft Formations” under supervision of Professor Jan Tommy Gravdahl. As part of his PhD degree, he was an MSCA research fellow in 2005 at the Laboratoire de Signaux et Systemes, Supelec in Paris, France, under the supervision of Dr. Antonio Loria. He has held several research/administrative positions, including as head of the Department of Electromechanical Systems at HiN from 2010-2012. From 2016-2022, he was the vice-dean for research at the Faculty of Engineering Science and Technology at UiT Narvik. He is currently the leader of the research group for electromechanical systems at UiT.

His research interests include modeling and nonlinear control of space and aerospace systems in general, and satellites and multirotors in particular, with a special focus on the attitude parameterization and control, as well as synchronization and coordinated control of agents in formation. In recent years, research activities have been directed towards increased sustainability in space. This includes the use of satellite formations with radar payloads for the detection and characterization of small particles of space debris, as well as advanced detection and avoidance of collisions for satellites in low Earth orbits. He has been a project leader and work package leader in several research projects funded by the Research Council of Norway and industry partners, and is currently leading the FRIPRO project "A CubeSat formation for space debris characterization (QBDebris)."

He has supervised more than 50 master's students and 6 PhD candidates, and has published more than 80 articles in international journals and at international conferences. He is a member of the editorial board for the Elsevier journals Control Engineering Practice (CEP) and Simulation Modelling Practice and Theory (SIMPAT).

Present positions

- Professor of automatic control at UiT Narvik (since 2016)
- Research scientist at SINTEF Narvik, Cold climate technology research group (since 2013)
- Head of the Electromechanical systems research group at IVT (since 2023)
- Associate Editor – Elsevier Control Engineering Practice (since 2025)
- Associate Editor – Elsevier Simulation Modelling Practice and Theory (since 2009)
- Board member at SINTEF Narvik (since 2019)

Previous positions

2018-2021	Member of the UiT Polar research committee
2018-2021	Board member of the Technology festival in Northern Norway (TINN)
2018-2021	Member of faculty boards at Faculty of Science and Technology and Faculty of Engineering Science and Technology, UiT
2018-2021	Deputy board member at the University Library, UiT
2016-2021	Vice dean R&D, IVT, UiT

2012-2013	Head, Department of Electromechanical systems, Narvik University College (NUC)
2011-2015	Board member NUC
2008-2014	Program coordinator, MSc Satellite engineering, IET
2008-2015	Associate professor of Engineering Cybernetics at NUC/UiT
2005	CTS research fellow under direction of Dr. Antonio Loría, Laboratoire de Signaux et Systemes (LSS), Supelec, Paris, France
2004-2008	PhD student at NUC (ITK, NTNU), directed by Professor Jan Tommy Gravdahl at ITK, NTNU.
2003-2004	Lecturer, NUC
2001-2002	Software Engineer, Kongsberg Spacetec AS, Tromsø

Academic Degrees

2008	PhD in Engineering Cybernetics, Department of Engineering Cybernetics (ITK), Norwegian University of Science and Technology (NTNU)
2000	M.Sc. (Siv. Ing.) in Engineering Cybernetics, ITK, NTNU
1998	B.Sc. (Ing.) in Computer Science, NUC

Courses and professional development activities

2022-2023	UNIPED100 Basic pedagogy for higher education
2021	Basic first aid
2019-2020	UNIPED600 Research supervision
2017-2018	UIT Management development program

Editorship, IPCs and peer-reviewing

2025	Member of the International Program Committee for the International Conference on Control, Decision and Information Technologies (CoDIT)
2022-2024	Associate Editor – Advanced Space Engineering, Frontiers in Space Technologies
2021-2022	Publication co-chair IEEE/SICE International Symposium on System Integration (SII) 2022
2020-	Member of the UiT editorial board
2012-2015	Member of the NUC Editorial board
2011-2013	Member of the International Program Committee for the International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH) 2011-2013
2010-	Session chair and co-chair at several international scientific conferences
2009 -	Member of the Editorial board of the Elsevier journal Simulation Modelling Practice and Theory
2005 -	Reviewer for a number of journals in mathematics and control: IEEE Transactions on Automatic Control, IEEE Transactions on Control Systems Technology, IEEE Transactions on Aerospace and Electronic Systems, AIAA Journal of Guidance, Control and Dynamics, Automatica, Simulation Modelling Practice and Theory, Aerospace Science and Technology, Neural Networks, Acta Astronautica, International Journal of Control, Aircraft Engineering and Aerospace Technology, International Journal of Automation and Computing.

University/industrial research and development projects

2023-	**A CubeSat formation for space debris characterization (QBDebris).** Project leader. Development and deployment of two CubeSats for space debris characterization using commercial automotive radars. Demonstration of radar applicability, as well as the possibility of advanced coordinated control and synchronized operation of satellites in LEO orbits using differential drag. Funded by FRIPRO, Norwegian Research Council.
2023-	**Sustainable Autonomous Systems and Solutions (SUMMATION).** Project leader Norway. Increasing SMEs' innovation capacity and use of advanced technologies in their operations through encouraging entrepreneurial processes, learning practices, and methods for advanced technologies. Funded by Interreg Aurora and Troms og Finnmark fylkeskommune.

2021- **Space Education 2.0.** Member of project steering group. Development of cooperation between Andøya Space and relevant education and industry partners. Development of economically sustainable training and test programs for student satellites. Funded by the Ministry of Education and Research.

2017- **Improved logistics from ships with unmanned logistics helicopters.** Project partner, project lead by Northern Research Institute (Norut). Developing mathematical models and control algorithms for unmanned multirotor systems, with special focus on take-off/landing on movable platforms and suspended loads. Project funded by MAROFF, Norwegian Research Council

2016- **Multiple Quadrotors for Challenging Spatial Measurement Operations (Quadruple).** Project leader. Establishing single and cooperating quadrotors as reliable and robust tools for performing challenging spatial field measurement operations with high precision through improved autonomy. Project partially funded by IVT/UiT

2016-2017 **Automated docking of large iron-ore carriers using tugboat coordination control (Autodock).** Project leader. Research and development of automated and semiautomated solutions for coordination of tugboat operations, for more efficient, safe and reliable docking of large vessels in constrained areas. Funded by RFFNORD, Norwegian Research Council

2016 **Transits models for ships operating in ice-covered waters (TransIce).** Project leader. Mathematical modelling and analysis of ship operations in the Arctic based on hybrid systems theory and S-AIS. Funded by RFFNORD, Norwegian Research Council

2016 **Quadrotor Avalanche Search and Rescue (QASAR).** Project leader. Guidance and control of quadrotor formations for avalanche search operations. Funded by RFFNORD, Norwegian Research Council

2010-2016 **Arctic Earth Observation and Surveillance Techniques (Arctic EO).** Project in cooperation with the Northern Research Institute (NORUT), Norwegian Polar Institute (NPI) and UiT, as well as several other research/industrial partners. Leader of the work package “Platforms and Sensors”, and member of the scientific advisory board. Research on optimal navigation and control of UAVs and UAV formations. Funded by NORDFORSK, Norwegian Research Council

2004-2008 **Student Space Exploration & Technology Initiative (SSETI).** Supervision of Master of Science students on spacecraft ADCS in cooperation with SSETI, European Space Agency (ESA), Norwegian Space Centre and NTNU

2001-2002 Software design and development of director mechanisms for RF-emitting antennas, a part of a target illuminating system developed by Kongsberg Defence & Aerospace for the Royal Norwegian Navy

2001 Design and development of a Matlab simulator for spacecraft attitude control, ordered by the space division at Kongsberg Defence & Aerospace and the Norwegian Defence Research Establishment (FFI)

2000 Design and development of laser pointing control system for optical inter-satellite links at Kongsberg Defence and Aerospace

2000 Improvement of canard control systems for Penguin missile at Kongsberg Defence & Aerospace

Student supervision and examination

2018- Committee member and defence opponent for 3 PhD candidates (NTNU, HVL)
2008- Supervision and co-supervision of 6 PhD candidates (2 completed) at NUC/UiT
2004- Supervision and co-supervision of more than 50 MSc students at NUC/UiT and NTNU

2004- External examiner of several Master of Science students at ITK, NTNU

Professional Societies

2024- Member of NTVA – The Norwegian Academy of Technological Sciences
2004- Senior Member of IEEE, Control Systems Society (senior member since 2022)
1998- Member of Tekna – The Norwegian Society of Graduate Technical and Scientific Professionals

Awards and appointments

2025 Nominated for the UiT innovative dissemination award
2015-2024 Nominated three times (2015, 2016, 2024) for the Students Educational Honorary Award (Studentenes pedagogikkærespris, NUC/UiT)
2009 - 2013 Identified as "Excellent Reviewer" by Associate Editors of the AIAA Journal of Guidance, Control and Dynamics
2007, 2008 Best presentation awards at the American Control Conference
2005 Awarded an EC Marie Curie scholarship in the framework of the CTS fellowship program

Publications

Author and coauthor of more than 80 scientific publications at renowned international conferences and journals, as well as several presentations, media outputs and popular science disseminations.

	All	Last 5 years
Citations	1922	599
h-index	19	10
i10-index	28	11

Google Scholar citation statistics (03/03/2025):
(http://scholar.google.no/citations?user=QpTmnC4AAAAJ&hl=no)

Some selected publications:

1. Kristiansen, R., H. L. Ørke and J. T. Gravdahl (2023). Modelling and simulation of interaction forces in tugboat-assisted docking of large marine vessels. Simulation Modelling Practice and Theory, vol. 130, pp. 1-18.
2. Oland, E., R. Kristiansen and J. T. Gravdahl (2020). A Comparative Study of Different Control Structures for Flight Control with New Results. IEEE Transactions on Control Systems Technology, vol. 28(2), pp. 291-305.
3. Johansen, T. A., J. J. Corona Sanchez and R. Kristiansen (2019). Dual quaternion control; a review on recent results within motion control. Nonlinear Studies, vol. 26(4), pp. 869-893.
4. Oland, E., T. S. Andersen and R. Kristiansen (2016). Subsumption Architecture Applied to Flight Control using Composite Rotations. Automatica, vol. 69, pp. 195-200.
5. Schlanbusch, R., A. Loría, R. Kristiansen and P. J. Nicklasson (2012). PD+ Based Output Feedback Attitude Control of Rigid Bodies. IEEE Transactions on Automatic Control, vol. 57, no. 8, pp. 2146-2152.
6. Schlanbusch, R., R. Kristiansen and P. J. Nicklasson (2011). Spacecraft formation reconfiguration with collision avoidance. Automatica, vol. 47, no. 7, pp. 1443-1449.
7. Kristiansen, R. and P. J. Nicklasson (2009). Spacecraft formation flying: A review and new results on state feedback control. Acta Astronautica, vol. 65, pp. 1537-1552.
8. Kristiansen, R. and D. Hagen (2009). Modelling of Actuator Dynamics for Spacecraft Attitude Control. AIAA Journal of Guidance, Control and Dynamics, vol. 32, no. 3, pp. 1022-1025.
9. Kristiansen, R., A. Loría, A. Chaillet and P. J. Nicklasson (2009). Spacecraft relative rotation tracking without angular velocity measurements. Automatica, vol. 45, no. 3, pp. 750-756.
10. Kristiansen, R., P. J. Nicklasson and J. T. Gravdahl (2009). Satellite Attitude Control by Quaternion-Based Backstepping. IEEE Transactions on Control Systems Technology, vol. 17, no. 1, pp 227-232.
11. Kristiansen, R., P. J. Nicklasson and J. T. Gravdahl (2008). Spacecraft coordination control in 6DOF: Integrator backstepping vs passivity-based control. Automatica, vol. 44, pp. 2896-2901.

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