

Curriculum vitae and track record

ROLE IN THE PROJECT Project manager Work package leader Project partner

PERSONAL INFORMATION*

- Name: SCHLANBUSCH, Rune:
- Date of birth: *19.03.1981*
- Sex: Male
- Nationality: Norwegian
- Researcher unique identifier(s): 0000-0002-0730-845X (ORCID)

KEY QUALIFICATIONS

My research interests include control theory, stability analysis, controller design, space and drone technology, condition monitoring and predictive maintenance, smart sensors based on vibrations and acoustic emissions, and applied Multiphysics modelling.

EDUCATION

- 2012* PhD: “Control of rigid bodies with applications to leader-follower spacecraft formations” (Excellent scientific level). Disputation date: 15.03.2012
Department of Engineering Cybernetics, Norwegian University of Science and Technology (NTNU), Norway
- 2007* MSc: Space Technology
Department of Technology, Narvik University College (Now the Arctic University of Norway), Norway

CURRENT AND PREVIOUS POSITIONS

- 2019-Present* Deputy Research Director
Smart Instrumentation and Industrial Testing, NORCE Norwegian Research Center, Norway
- 2018-Present* Chief Technology Officer
Machine Prognostics AS, Norway
- 2013-2018* Senior Researcher
Smart Instrumentation, NORCE Norwegian Research Center (Former Teknova), Norway
- 2013-2017* Associate Professor II – Space Technology
Department of Technology, Narvik University College/The Arctic University of Norway
- 2011-2013* Associate Professor and Program Coordinator – Space Technology
Department of Technology, Narvik University College/The Arctic University of Norway

FELLOWSHIPS, AWARDS and PRIZES

- 2018* SFI Offshore Mechatronics’ Innovation Award “Method and Apparatus for Detecting Wire Breaks in Ropes”

MOBILITY

- 2009* Laboratoire des Signaux & Systèmes, Centre national de la recherche scientifique (CNRS), three months visit to Antonio Loria

SELECTED COURSES

2019	EcoOnline
2017	Certified Vibration Analyst ISO Category II
2015	Offshore Drilling Course
2014	PHM Fundamentals - From Monitoring/Sensing to Fault Diagnosis and Failure Prognosis
2014	The Center for Professional Advancement "Pilot Plant and Scale-Up Studies" by Gary B. Tattersson
2014	Series of COMSOL mini-courses
2011	ECCI Graduate School on Control "Controlled Synchronisation of Dynamical Systems" by Antonio Loría & Elena Panteley
2010	ECCI Graduate School on Control "Stabilization for nonlinear dynamical systems" by Laurent Praly

SELECTED PROJECTS

2019-Present	Project leader, Autonomous drone for real-time inspection of furnace in metal production plant , Setting up autonomous drone for thermal hot-spot detection by indoor camera-based simultaneous localization and mapping, RFF Agder
2019-Present	Project leader, Roof washing by drone , Integrate roof washing system on drone for avoiding people working in heights, Forskningsmobilisering
2018-Present	Project leader, HI2Class , automatic classing of marine vessels based on condition-monitoring data, RFF Agder
2015-Present	Task leader, Condition monitoring of large steel wire ropes , Develop sensors, models and algorithms for real-time assessment of steel wire ropes for offshore applications, Supervisor (post doc), Condition monitoring of hydraulic cylinders , NFR SFI Offshore Mechatronics
2014-Present	Project leader, Modeling of resistivity sensor for measurement while coring system , Modeling, simulation and testing of resistivity sensor, industry funded
2018	Project leader, Mathematical modeling of extrusion process , Develop data driven model for plastic hose production, RFF Agder
2018	Project leader, Space rockets from sea , Modeling and simulation of sea rocket and water ballast system, Ny Vekst
2017-2019	Team member, Next generation of vibration sensors for rotating machinery , Commercialization of Foresight smart vibration sensor system, NFR FORNY
2017-2019	Team member, Future Robotics , Increase awareness and competency for robotics and automated production within the South of Norway, Sørlandets kompetansefond
2017	Project leader, Competency building towards innovative technology for precision farming , Demonstration of research front for increasing competency and awareness of regional farmers, RFF Agder
2017	Project leader, Simulation of multi modus PCB antenna for near field communication , FEM antenna simulation and design for wireless power and data transfer, VRI (pre project), RFF Vestlandet
2016	Project leader, Prognostics and health management , Road mapping of condition-based maintenance technical program for MHWirth, industry funded
2015-2017	Task leader, Competency building towards cost effective condition-based maintenance for the offshore industry , Developed innovative acoustic emission sensor system for structural health monitoring, Sørlandets kompetansefond
2015	Project leader, New sensor technology for condition-based maintenance of wooden utility poles , Evaluate sensor technologies for efficient remote inspection of rot in wooden utility poles, RFF Agder (pre-project), NFR (main project)

2013-2015 Team member, **Energy Optimization Off-Shore (EOOS)**, Methods for energy optimization offshore, with a strong focus on organic rankine cycle (ORC) for waste heat recovery, NFR

2013-2015 Team member, **Metallurgical process scale-up**, From research to industrialization through mathematical models and procedures that safeguard the critical process capabilities during scale-up, RFF Agder

SUPERVISION AND CO-SUPERVISION OF GRADUATE STUDENTS AND RESEARCH FELLOWS

2007-Present 1 PhD student (NTNU), 1 post doc (NORCE), 16 MSc and 5 BSc theses (UiT and UiA)

TEACHING ACTIVITIES

2012-2018 Spacecraft systems engineering, MSc, 10ECTS, The Arctic University of Norway

2011-2013 Spacecraft mechanisms, MSc, 5ECTS, Narvik University College, Norway

2011-2013 Basic communication, BSc, 5ECTS, Narvik University College, Norway

2007-2009 Digital communication, BSc, 5ECTS, Narvik University College, Norway

ORGANISATION OF SCIENTIFIC MEETINGS

2020 Organizing Committee, Bedre Fly(t), drones in public sector, 100 participants, Norway

2019 Organizing Committee, Bruk av droner i bla. inspeksjon og vedlikehold, 50 participants, Norway

2018 Organizing Committee, The Nordic Drone Event, 100 participants, Svalbard, Norway

2018 Organizing Committee, Drones in Energy Sector, 50 participants, Norway

2017-Present Organizing Committee, Unmanned Nordic Conference, 200 participants, Norway

2017 Lead Organizer, Workshop on Digitalization and Industry 4.0 in Agder, 40 participants, Norway

2017 Lead Organizer, Workshop on Robot Technology within Farming, 30 participants, Norway

2017 Lead Organizer, Innovation Workshop, UAS Norway, 110 participants, Norway

2016-2017 Organizing Committee, Specialist Rope Seminar, 50 participants, Norway

2015-2016 Organizing O&G panel session at Prognostics and Health Management Conferences, US

INSTITUTIONAL RESPONSIBILITIES

2018-2019 Assessment committee for employment, Faculty of Engineering, The Arctic University of Norway (UiT)

2018 Opponent for Adam Leon Kleppe, PhD Defence, Department of Mechanical and Industrial Engineering, NTNU, Norway

COMMISSIONS OF TRUST

2019-Present Board member of Aersea AS, Kristiansand, Norway

2017-Present Leader of R&D technical group, UAS Norway (Norwegian drone association), Norway

2010-Present Reviewer of over 30 international scientific journals including IEEE Transactions on Automatic Control, IEEE Transactions on Control Systems Technology, IEEE Transactions on Industrial Electronics, IEEE Transactions on Neural Networks and Learning Systems, Automatica, Systems & Control Letters; Reviewer for over 20 international conferences including American Control Conference, Conference on Decision and Control, IFAC Symposium on Automatic Control, IFAC World Congress

2014-2016 Board member of TEKNA Aust-Agder, Norway

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2010-Present Member of IEEE Control Systems Society and Robotics and Automation Society

MAJOR COLLABORATIONS

Eric Bechhoefer, research and development of diagnostic and prognostics system technology for condition monitoring of rotating machinery, Green Power Monitoring Systems Inc., USA

Antonio Loría, Analysis and control design for nonlinear systems, CNRS, France

PUBLICATIONS (peer-reviewed)

44 conference publications, 14 journal publications and one book chapter.

Shanbhag, V. V., T. J. J. Meyer, L. W. Caspers and R. Schlanbusch (2021). Failure Monitoring and Predictive Maintenance of Hydraulic Cylinder - State-of-the-Art Review. *IEEE/ASME Transactions on Mechatronics* (Preprint)

Shanbhag, V. V., T. J. J. Meyer, L. W. Caspers and R. Schlanbusch (2020). Condition monitoring of hydraulic cylinder seals using acoustic emissions. *The International Journal of Advanced Manufacturing Technology*, vol. 109, pp. 1727-1739

Nordgård-Hansen, E., H. J. Hassel and R. Schlanbusch (2019). Chemometrics as a tool to gain insight into fiber rope aging from infrared images. In: *Proceedings of the Annual Conference of the PHM Society*

Stave, D. Å., R. Schlanbusch, D. Vysochinskiy and G. Grasmø (2019). Condition Monitoring of Steel Wire Ropes. In: *Proceedings of the OIPEEC Conference*

Schlanbusch, R., E. Oland and E. Bechhoefer (2017). Condition Monitoring Technologies for Steel Wire Ropes – A Review. *International Journal of Prognostics and Health Management*, vol. 1, 14 pages

Bechhoefer, E., R. Schlanbusch and T. I. Waag (2016). “Techniques for Large, Slow Bearing Fault Detection”. *International Journal of Prognostics and Health Management*, vol. 7, 11 pages

Schlanbusch, R. and E. I. Grøtli (2015). “Hybrid Certainty Equivalence Control of Rigid Bodies with Quaternion Measurements”. *IEEE Transactions on Automatic Control*, vol. 60, no. 9, pp. 2512-2517, doi: 10.1109/TAC.2014.2382153

Schlanbusch, R., A. Loría, and P. J. Nicklasson (2012). “On the stability and stabilization of quaternion equilibria of rigid bodies”. *Automatica*, vol. 48, no. 12, pp. 3135-3141

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, doi: 10.1109/TAC.2012.2183189

Schlanbusch, R., E. I. Grøtli, A. Loría and P. J. Nicklasson (2012). “Hybrid attitude tracking of rigid bodies without angular velocity measurements”. *Systems & Control Letters*, vol. 61, no. 4, pp. 595-601, doi: 10.1016/j.sysconle.2012.01.008

Schlanbusch, R., R. Kristiansen, and P. J. Nicklasson (2011). “Spacecraft formation reconfiguration with collision avoidance”. *Automatica*, vol. 47, no. 7, pp. 1443-1449. doi:10.1016/j.automatica.2011.02.014

INVITED PRESENTATIONS

Getting the Youth Excited: How Drones are Helping Eco-Agents Save Our Environment. Xponential, 2019, Chicago, IL

Drones and autonomous systems shaping the future arctic observing system. Arctic Partnership Week 2018, Busan, North Korea.

Research and development on drones in Norway. Unmanned Nordic Conference 2016, Oslo, Norway

Mathematical methods for prognostics. CBM Specialist Workshop 2015, Grimstad, Norway