

# Curriculum Vitae

Professor Jan Tommy Gravdahl

Dr.Ing., siv.ing. Engineering Cybernetics

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## Affiliation

Jan Tommy Gravdahl

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## Publications

Author of 5 books:

- P. Liljebäck, K.Y. Pettersen, Ø. Stavdahl and J.T. Gravdahl, Snake Robots: Modelling, Mechatronics, and Control, Springer Verlag, London, 2013
- From, P.J., Gravdahl, J.T. and Pettersen, K.Y., "Modeling and control of vehicle-manipulator Systems", Springer Verlag, London, 2014
- Gravdahl, J.T. and O. Egeland, "Compressor surge and rotating stall: Modeling and control ", Springer Verlag, London, 1999
- O. Egeland and Gravdahl, J.T., "Modeling and simulation for control", Marine Cybernetics, Trondheim, 2002
- Pettersen, K.Y.; Gravdahl, J.T.; Nijmeijer, H. (Eds.), "Group Coordination and Cooperative Control", Series: Lecture Notes in Control and Information Sciences, Vol. 336, Springer Verlag, Heidelberg, 2006

Author of more than 300 scientific journal- and conference publications. For full list, see <http://folk.ntnu.no/tomgra/publications.html> .

H-index: 47, number of citations: 8000 (Google Scholar)

## Current positions

- Professor, Department of Engineering Cybernetics, NTNU, 2005-
- Technology advisor and co-founder, Eelume AS, 2015-
- Senior Editor for IFAC Mechatronics, Elsevier, 2017-2022
- Associate Editor IEEE Transactions on Control Systems Technology, 2020-
- Student Councillor, Department of Engineering Cybernetics, NTNU, 2005-
- Member of the "Motion control group" at the Dept. of Engineering Cybernetics, a research group graded "Excellent" by the evaluation of the ICT-research institutions in Norway carried out by the Norwegian research council in 2003 and 2012
- Deputy member of the board for research and education of researchers (Utvalg for forskning og forskerutdanning), Faculty of Information Tech., Mathematics and Electrical Engineering, 2008-
- Member of SUROMA, Samarbeidsutvalget for romrelatert aktivitet mellom NTNU, NAROM og ARS, 2011-

## Academic Degrees

1998 Dr.ing (PhD), Engineering Cybernetics, NTNU.  
1994 Siv.ing. (MSc)), Engineering Cybernetics, NTNU.

## Previous Positions

2023 Visiting professor with Eindhoven University of Technology, the Netherlands, Apr-May  
2022 Visiting professor with The University of Newcastle, Australia, Oct-Dec  
2017 Member of the board, Norsk forening for automatisering – NFA (Norwegian Society of Automatic Control)  
2012-2018 Member of the council for the PhD programme in medical technology, NTNU  
2008-2015 Board member of the NTNU/SINTEF Gemini centre Advanced Robotics  
2009-2014 Key Scientist, Strategic University Program on Control, Information and Communication Systems for Environmental and Safety Critical Systems  
2009-2013 Member of the council (institutttråd) Department of Engineering Cybernetics  
2004-2013 Scientific advisor to SINTEF Electronics and Cybernetics  
2012-2013 Board member, Board of Faculty of Information Technology, Mathematics and Electrical Engineering  
2012-2013 Medlem av tilsteningsutvalget for akademiske stillinger IME-fakultetet  
2009-2012 Deputy board member, Board of Faculty of Information Technology, Mathematics and Electrical Engineering,  
2008-2009 Head of department. Dept. of Engineering Cybernetics, NTNU  
2010-2011 Member of studieprogramrådet for MTTK  
2004-2009 Key Scientist, Strategic U. Program on Comp.Methods in Nonlinear Motion Control  
2005-2007 Member of the board for research and education of researchers (Utvalg for forskning og forskerutdanning), Faculty of Information Tech., Math. and Electrical Engineering,  
2007-2011 Member of the Editorial board of the Elsevier journal Simulation Modelling Practice and Theory.  
2007-2008 Visiting professor with the Centre for Complex Dynamical Systems and Control, The University of Newcastle, Australia, July'07-June'08  
2005-2007 Deputy head of department. Dept. of Engineering Cybernetics, NTNU  
2005-2009 Member of the council (institutttråd) Department of Engineering Cybernetics, NTNU  
2001-2005 Associate Professor, Dept. of Engineering Cybernetics, NTNU  
1999-2001 Post Doctoral Fellow. Financed by ABB Industri AS and Department of Engineering Cybernetics. Work on modeling and active stabilization of centrifugal compressors for natural gas transport.  
1999 Lecturer in Control Engineering , Dept. of Engineering Cybernetics, NTNU  
1998 Post Doctoral Fellow, Strategic University Program in Marine Cybernetics  
1995-1997 Dr.Ing student. Norwegian Research Council Scholarship  
1994 Teaching Assistant

## Teaching experience

2004-2023	TTK4100 Introduction to computerized control	NTNU	150	students
2002-2005	TTK7 Servomechanisms	NTNU	20	students
1999, 2004	TTK4105 Control Engineering	NTNU	250	students
2001-03	Experts in Team, a multidisciplinary and multifacultary project	NTNU	30	students
2001	TTK8 Nonlinear Motion control	NTNU	25	students
2001	TTK4150 Nonlinear Systems	NTNU	60	students
2000-2022	TK8103 Nonlinear Systems, PhD course	NTNU	25	students

1999                      Calculus    Norwegian Air Force    3                      students  
 Academy

## **Pedagogical training/experience**

2002-                      External examiner in the courses Control Engineering I and II at the Univeristy in Stavanger, and for the Space Tecnology course, project assignments and MSc Theses at Narvik University College and .

2004                      Planning and teaching a new subject, TTK4100 Introduction to Computerized Control (Norw: Kybernetikk introduksjon) in the MSc programme in Engineering Cybernetics. The subject is mandatory for all first year students (approx 90 students/year), and the work included putting together a curriculum, writing new teaching material, [59], and creating new laboratory assignments and problem sets.

2004                      PEDUP: One year course in university pedagogics at the Norwegian Univ. of Science and Technology.

2002                      Co-author, with O. Egeland, of the textbook Modeling and simulation for control [2] which is used as textbook in the course Modeling and Simulation, a 4th year course in the MSc programme in Engineering cybernetics.

2001-03                      Taken the initiative to, and carried out, the organization of three “villages” in the multifacultary project Experts in Team.

## **Awards and Appointments**

2017                      Awarded the IEEE Transactions on Control Systems Technology Outstanding Paper Award for the year 2017 for the paper W. Caharija, K.Y. Pettersen, M. Bibuli, P. Calado, E. Zereik, J. Braga, J.T. Gravdahl, A.J. Sørensen, M. Milovanovic and G. Bruzzone, “Integral Line-of-Sight Guidance and Control of Underactuated Marine Vehicles”, IEEE Transactions on Control Systems Technology, 24(5), pp. 1623--1642, September 2016,

2017                      Appointed member of the Norwegian Academy of Technological Sciences – NTVA.

2017                      Best Conference Paper Award at Robio 2017 for the paper A.M. Kohl, S. Moe, E. Kelasidi, K.Y. Pettersen and J.T. Gravdahl, Set-based path following and obstacle avoidance for underwater snake robots, proc. IEEE int. conference on robotics and biomimetics (Robio), Macau, China, Dec. 5-8, 2017

2010                      Finalist for Best Paper Award of the 11th International Conference on Control, Automation, Robotics and Vision (ICARCV), Singapore, 7 - 10 December 2010 for the paper P. Liljebäck, K.Y. Pettersen, Ø. Stavdahl and J.T. Gravdahl, ” Experimental Investigation of Fundamental Properties of Snake Robot Locomotion”, in Proc. the 11th International Conference on Control, Automation, Robotics and Vision.

2004                      Appointed Senior member IEEE

2000                      Awarded the 2000 IEEE Transactions on Control Systems Technology Outstanding Paper Award for the paper J.T. Gravdahl and O. Egeland, ”Centrifugal Compressor Surge and Speed Control”, IEEE Transactions on Control Systems Technology, Volume 7, Number 5, Pages 567-579, September 1999.

1995-97                      PhD scholarship from the Norwegian Research Council

## **Plenary lectures**

2021                      Modeling and control of underwater snake robots, plenary lecture at DARS-SWARM’21, Kyoto, Japan

2018                      Active control of surge in compressors, plenary lecture at SYMKOM 2018, Lodz, Poland, October 18-20, 2018

## Awards to students

- 2023 Best Student Paper Award awarded to Erlend A. Basso for the paper “Synergistic PID and Output Feedback Control on Matrix Lie Groups”, presented at the 12th IFAC Symposium on Nonlinear Control Systems, Canberra, Australia, Jan. 4-6, 2023
- 2018 Best student paper to Mathias Hauan Arbo for the paper “A System Architecture for Constraint-Based Robotic Assembly with CAD Information” presentet at the 2018 IEEE Conference on Automation Science and Engineering (CASE), Munich, Germany
- 2017 Best student paper finalist for the paper M. R. P. Ragazzon, Gravdahl, J. T., and Pettersen, K. Y. (2017). Exponential Convergence Bounds in Least Squares Estimation: Identification of Viscoelastic Properties in Atomic Force Microscopy. In Proc. IEEE Conference on Control Technology and Applications, August 27-30, Kohala Coast, Hawai’i, USA. Accepted for presentation.
- 2015 Best student paper award for the paper Ø.F. Auestad, T. Perez, J.T. Gravdahl, A. Sørensen and T.H. Espeland, Boarding Control System - for Improved Accessibility to Offshore Wind Turbines, In proceedings of the 10th IFAC Conference on Manoeuvring and Control of Marine Craft (MCMC'2015), Copenhagen, Denmark, August 24-26, 2015
- 2010 Best student paper award in the area of Signal processing, systems modeling and control at the 7th International Conference on Informatics in Control, Automation and Robotics (ICINCO 2010), Funchal, Madeira, Portugal, June 15-18, 2010 for the paper Grøtli, E. I., Chaillet, A., Panteley, E., Gravdahl, J. T., Robustness of ISS systems to inputs with limited moving average, with application to spacecraft formations
- 2011 Kristian Jensen and Kaan Husby Yabar were awarded with the IBM Best Student Recognition Event for their MSc thesis Development, Implementation and Testing of Two Attitude Estimation Methods for Cube Satellites
- 2011 Pål Liljebäck, awarded *the 2011 ExxonMobil prize for best doctoral dissertation at NTNU* for his thesis: Modelling, Development, and Control of Snake Robots, NTNU thesis 2011:70
- 2007 Dr Bjørnar Bøhagen and PhD student Raymond Kristiansen both received best presentation awards at the 2007 American Control Conference
- 2005 MSc Øyvind Hegrenæs was awarded NFA's (National IFAC Member Organization) prize for best MSc Thesis within the field of Automatic control in Norway in the year 2004 for the thesis entiteled ”Attitude Control by Means of Explicit Model Predictive Control, via Multi-Parametric Quadratic Programming”.
- 2005 Krøvel T.D was awarded the Young Lunar Explorers Award by the International Lunar Exploration Working Group (ILEWG) for his paper Krøvel T.D, K. Jerpetjøn and S. Ulrich, "The European Student Moon Orbiter Project", The 2005 International Lunar Conference on the Exploration and Utilization of the Moon, September 18-23, 2005.
- 2005 MSc Thomas R. Krogstad was awarded a sponsorship for his paper "Coordinated control of satellites: the attitude case" by ESA for the Student Participation Programme to the International Astronautical Congress 2005 in Fukuoka, Japan
- 2003 MSc students K.M. Fauske, F. Indergaard, and K. Svartveit were awarded with a Honorable Mention and a 2000\$ scholarship in the 11<sup>th</sup> Annual Frank J. Redd Student Scholarship Competition for the paper [60], presented at the 17th Annual AIAA/USU Conference on Small satellites, Logan, Utah, August, 2003

## Graduated PhD students (18 as supervisor, 11 as co-supervisor)

1. Bjørnar Bøhagen (2007), Active control of surge in centrifugal compressors.
2. Raymond Kristiansen (2008) (co-advised), Coordinated control of spacecraft formations,
3. Svein Hovland (2008), Model Reduction and Control in Computational Fluid Dynamics (CFD)
4. Thomas R. Krogstad (2010), Attitude synchronization in spacecraft formations Theoretical and experimental results
5. Esten Ingar Grøtli (2010), Robust stability and control of spacecraft formations
6. Pål Johan From (2010), Off-Shore Robotics: Robust and Optimal Solutions for Autonomous Operation

7. Pål Liljebäck (2011) (co-advised), Modelling, Development, and Control of Snake Robots
8. Rune Schlanbusch (2012) (co-advised), Optimal Control of Cluster Satellites for Improved Remote Sensing
9. Arnfinn Aas Eielsen (2012), Topics in Control of Nanopositioning Devices
10. Walter Caharija (2014) (co-advised), Integral Line-of-Sight Guidance and Control of Underactuated Marine Vehicles,
11. Espen Oland (2014) (co-advised), Nonlinear control of fixed-wing unmanned aerial vehicles
12. Øyvind F. Auestad (2015), The Boarding Control System: Modelling and control of a Surface Effect Ship for improved accessibility to offshore wind turbines
13. Ehsan Rezapour (2015) (co-advised), Model-based Locomotion Control of Underactuated Snake Robots
14. Eleni Kelasidi (2015) (co-advised), Modeling, Control and Energy Efficiency of Underwater Snake Robots,
15. Christoph Backi (2015), Modeling, estimation and control of freezing and thawing processes
16. Mutaz Tuffaha (2016), On the Management and Control of isolated Power Systems
17. Nur Uddin (2016), Active Compressor Surge Control System Using Piston Actuation: Theory, Design and Experiments
18. Signe Moe (2016) (co-advised) Guidance and Control of Robot Manipulators and Autonomous Marine Robots
19. Anna Kohl (2017) (co-advised), Guidance and Control of Underwater Snake Robots Using Planar Sinusoidal Gaits
20. Serge Gale (2017), Topics in Machine Learning and Next Generation Robotics
21. Michael Ragazzon (2018), Parameters estimation in atomic force microscopy: Nanomechanical properties and high-speed demodulation
22. Trygve Utstumo (2018), Asterix - Robotic weed control in row crops
23. Mathias Hauan Arbo (2019), On Robotic Assembly and Optimization-Based Control of Industrial Manipulators
24. Ida-Louise Borlaug (2020) (co-advised), Robust Control of Articulated Intervention-AUVs using Sliding Mode Control
25. Linn Danielsen Evjemo (2022), Additive manufacturing of thin-walled structures by robot manipulator: An experimental approach focusing on arc welding
26. Erlend A. Basso (2022) (co-advised), Nonlinear and Hybrid Feedback Control of Marine Vehicles and Multirotors
27. Katrine Seel (2023), Learning for Model Predictive Control
28. Erlend Lundby (2023), Data-Driven Dynamical Modeling in the Face of Data Limitations
29. Akhil S Anand (2023), Model-based Reinforcement Learning for Variable Impedance Control

### **PhD students in progress (3 as supervisor, 13 as co-supervisor)**

1. Amer Orucevic, Energy harvesting
2. Bjørn Andreas Kristiansen, Energy optimality for spacecraft attitude manoeuvres
3. Mariusz Eivind Grøtte, Smallsats
4. Tom Stian Andersen (co-advised), Nonlinear control of civilian autonomous aerial vehicles
5. Jørgen Sverdrup-Thygeson (co-advised), Swimming Robot Manipulators for Subsea IMR.
6. Marianna Wrzos-Kaminska (co-advised), Free-floating intervention operations using articulated intervention-AUVs
7. Eirik Lothe Foseid (co-advised), Robust motion planning and control of AIAUVs
8. Gianluca d'Antuono (co-advised), Hyper-redundant robots for maintenance in Big Science Facilities
9. Bjørn Kåre Sæbø (co-advised), Motion planning and control of light-UVMS
10. Ingrid Fjordheim Onstein (co-advised), Deburring Using Robot Manipulators
11. Ivan Gushkov (co-advised), Energy autonomous AIAUVs
12. Torje Nysæther (co-advised), Vision-based Autonomous Docking and Intervention Operations
13. Mads Erlend Bøe Lysø (co-advised), Energy efficient propulsion and energy harvesting for underwater robot autonomy

14. Jan Inge Dyrhaug (co-advised), Interaction control of light vehicle-manipulator systems
15. Erling Tveter (co-advised), Interaction control of light-weight vehicle-manipulator systems
16. Markus H. Iversflaten (co-advised), Cooperative control for joint observation and intervention tasks

### **Post.docs**

1. Pål Johan From, 2010-2011
2. Marialena Vagia, 2011-2012 (Marie Curie/ERCIM) and 2012-2015 (KMB NexGenRob)
3. Arnfinn Aas Eielsen, 2012-2014
4. Signe Moe, 2017-19 (SFI Manufacturing)
5. Michael Ragazzon, 2018-2021
6. Mathias Hauan Arbo 2019-2021 (SFI Manufacturing)

### **Visiting PhD students**

1. Martin Ansbjerg Kjaer, Dept. of Automatic Control, Lund University, Sweden, autumn 2004.
2. Jan van Helvoirt, Eindhoven University of Technology, Mechanical Engineering, Control Systems Technology, the Netherlands, autumn 2006.
3. Alain Sarlette, University of Liège, Belgium, spring 2007

### **Member of doctoral adjudication committee**

1. 2000 Dag Kristiansen, Dept. of Engineering Cybernetics, NTNU
2. 2004 Bjørn Skåre, Dept. of Engineering Cybernetics, NTNU (administrator)
3. 2005 Martin Kjær (lic.tec), Lund Institute of Technology, Sweden
4. 2006 Glenn-Ole Kaasa, Department of Energy and Process Engineering, NTNU
5. 2009 Lars Alminde, Aalborg University, Denmark
6. 2009 Dagfinn Snarheim, Dept. of Engineering Cybernetics, NTNU (administrator)
7. 2011 Hege Langjord, Dept. of Engineering Cybernetics, NTNU (administrator)
8. 2013 Olof Sörnmo (lic.tec), Lund Institute of Technology, Sweden
9. 2013 Agus Ismail Hasan, Dept. of Engineering Cybernetics, NTNU (administrator)
10. 2013 Ehsan Peymani, Dept. of Engineering Cybernetics, NTNU (administrator)
11. 2013 Michael Hansen, Aalborg University, Denmark
12. 2013 Magnus C. Bjerkeng, Dept. of Engineering Cybernetics, NTNU (administrator)
13. 2014 Maryamsadat Tahavoris, Aalborg University, Denmark
14. 2014 Joakim Haugen, Dept. of Engineering Cybernetics, NTNU (administrator)
15. 2015 Filippo Sanfilippo, Dept. of Engineering Cybernetics, NTNU (administrator)
16. 2015 Olof Sörnmo, Lund Institute of Technology, Sweden
17. 2016 Hodjat Rahmati, Dept. of Engineering Cybernetics, NTNU (administrator)
18. 2016 Mohsen Vatani, Dept. of Engineering Cybernetics, NTNU (administrator)
19. 2016 Dennis J.W. Belleter, Dept. of Engineering Cybernetics, NTNU (administrator)
20. 2017 Kristian G. Hanssen, Dept. of Engineering Cybernetics, NTNU (administrator)
21. 2017 Stepan Pchelkin, Dept. of Engineering Cybernetics, NTNU (administrator)
22. 2018 Jesper Knudsen, Aalborg University, Denmark
23. 2018 Albert Sans Muntadas, Dept. of Engineering Cybernetics, NTNU (administrator)
24. 2018 Kasper Trolle Borup, Dept. of Engineering Cybernetics, NTNU (administrator)
25. 2018 Trond Andresen (dr. philos), Dept. of Eng. Cybernetics, NTNU (administrator)
26. 2019 Sondre Sanden Tørdal, University of Agder, Norway
27. 2019 Martin Syre Wiig, Dept. of Eng. Cybernetics, NTNU (administrator)
28. 2020 Naveen Velmurugan, MINES Paris Tech, France
29. 2021 Vignesh Raja Ponnambalam, Norwegian University of Life Sciences
30. 2021 Mikkel Eske Sørensen, Dept. of Eng. Cybernetics, NTNU (administrator)
31. 2022 Dipendra Subedi, University of Agder, Norway
32. 2023 Siri Marte Schlanbusch, University of Agder, Norway
33. 2023 Jonatan Sjølund Dyrstad, Dept. of Eng. Cybernetics, NTNU (administrator)
34. 2023 Nima Karbasizadeh, Delft University of Technology, The Netherlands

## **Member of professor assessment/employment committee**

2014 The University of Texas at Austin, USA  
2014 Oslo and Akershus University College of Applied Sciences, Norway  
2014 The University of Newcastle, Australia x2  
2015 The University of Stavanger, Norway  
2017 The University of Newcastle, Australia x2  
2018 University of Aalborg, Denmark  
2018 The Arctic University of Norway x2  
2021 Norwegian University of Life Sciences, Norway  
2019 University of Agder, Norway  
2021 Norwegian University of Life Sciences, Norway  
2022 Tampere University, Finland  
2022 The Arctic University of Norway  
2023 Norwegian University of Life Sciences, Norway x2

## **Member of evaluation committees**

2021 BSc/MSc Aerospace Control Engineering/Satellitetechnologi/Elektronikk, UiT - The Arctic University of Norway  
2017 PhD programme in mechatronics, University of Agder  
2016 Evaluator for the Czech Science Foundation  
2015 Master programme in satellite technology, Narvik University College, Norway  
2009 Evaluator for the MASTER programme of the Foundation for Polish Science

## **Program committee work**

- Advisory Committee member of SWARM2024, Kyoto, Japan, November, 2024
- Associate Editor for the IFAC World Congress, Yokohama, 2023
- Member of IPC, the 11<sup>th</sup> Int. Conf. on Control, Mechatronics and Automation (ICCMA), Grimstad, Norway, 2023
- Associate editor for the 9th IFAC Symposium on Mechatronic Systems (Mechatronics 2022)
- Member of IPC, IFAC MATHMOD 2021, Wien, Austria
- Associate Editor for the IFAC World Congress, Berlin, 2020
- Advisory Committee member of DARS-SWARM2020, Kyoto, Japan, November, 2020
- Technical program committee member for IEEE 16th International Workshop on Advanced Motion Control (AMC2020)
- Associate editor, The 14th International Symposium SYMKOM 2020 IMP2 (Symposium on Compressor & Turbine Flow Systems – Theory & Applications), Gdańsk, Poland, October 2020
- Member of IPC, the 8<sup>th</sup> Int. Conf. on Control, Mechatronics and Automation (ICCMA), Moscow (Virtual), 2020
- Associate Editor at Large for the 2019 American Control Conference (ACC)
- Associate editor for the 8th IFAC Symposium on Mechatronic Systems (MECHATRONICS 2019)
- Member of Scientific Committee for SYMKOM 2018 IMP2, Lodz, Poland
- Associate editor for IEEE CCTA, Copenhagen, Denmark 2018
- Member of the advisory committee for The International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM2017), Kyoto, Japan, October 2017
- Associate Editor for the IFAC World Congress, Toulouse, July 9-14, 2017
- Member of the Program Committee (PC), IEEE Conference on Robotics and Biomimetics (ROBIO 2016), December 3-7, 2016, Qingdao, China
- Member of the advisory committee for The International Symposium on Swarm Behavior and Bio-Inspired Robotics 2015 (SWARM2015), Kyoto, Japan, October 28-30, 2015

- Associate Editor for 1st IFAC Conference on Modelling, Identification and Control of Nonlinear Systems (MICNON-2015), Saint-Petersburg, RUSSIA, June 24-26, 2015
- Member of the international program committee, 4th International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH), Vienna, Austria, September 2-4, 2014
- Member of the international program committee, 3rd International Conference on Simulation and Modeling Methodologies, Technologies, and Applications (SIMULTECH), Reykjavik, Iceland, July 29-31, 2013
- Associate Editor for the 2012 IEEE International Conference on Robotics and Automation, May 14-18, 2012, RiverCentre, Saint Paul, Minnesota, USA
- Associate Editor (AE) for the Conference Editorial Board (CEB) of the IEEE Robotics and Automation Society for ICRA 2012
- Member of the International Program Committee (IPC), ICCAS 2012, October 17-21, 2012, Jeju Island, Korea.
- Member of the International Program Committee (IPC), The 2011 Chinese Control and Decision Conference (CCDC), Mianyang, China, May 23-25, 2011
- Member of the Program Committee (PC), IEEE International Conference on Robotics and Biomimetics, ROBIO, Phuket Island, Thailand, December 7-11, 2011
- Member of the Program Committee (PC), IEEE International Conference on Robotics and Biomimetics, ROBIO, Tianjin, China, December 14-18, 2010.
- Member of Technical Program Committee (TPC) of The Eleventh International Conference on Control, Automation, Robotics and Vision, ICARCV 2010, Singapore, December 2010
- Member of the national organizing committee (NOC) and program committee (PC) for the 46th Scandinavian Conference on Simulation and Modeling, Trondheim, SIMS'05, October 13-14, 2005
- Co-organizer (with K.Y. Pettersen and H. Nijmeijer) of the Workshop on Group Coordination and Cooperative Control, Tromsø, May 28-30, 2006

## Dissemination

- "Budget satellites take the cube route into space" by Will Knight, New Scientist, 8. October, 2005, issue 2520.
- "Kyb-ekspertise mellom to permer", interview by Arne Asphjel, Universitetsavisa, 1.2.05,
- "Gjør det umulige mulig", interview by Tore Oksholen, Gemini, no.4 2007
- "Kybernetikk sparer penger", interview by Tore Oksholen, www.forskning.no, 31.10.2007,
- "Kybernetikk sparer penger", interview by Tore Oksholen, 6.11.07, Universitetsavisa,
- "Kan en robot gjøre jobben til en bie?", Ekko, NRK P2 [Radio] 2016-03-09

## Patents

2015	K.Y. Pettersen, P. Liljebäck, A.J. Sørensen, Ø. Stavdahl, F. Lund, A.A. Transeth, J.T. Gravdahl, Underwater manipulator arm robot, US10751872
2014	K.Y. Pettersen, P. Liljebäck, E. Kelasidi, J.T. Gravdahl, Guidance of underwater snake robots, EP3204834B1
2010	J. T. Gravdahl and N. Uddin, Industrial Compressor System, Patent application.
2001	J.T. Gravdahl, S.O. Vatland and H. Devold, NO313926, "Active Compressor Stability Control"

## University/Industrial Research projects

2019-2023	<b>Towards autonomy in process industries - Combining data-driven and model-based methods for estimation and control" – TAPI.</b> Funding for 2 PhD-students, budget 7.2MNOK (total budget 29.3MNOK)
2019-2023	<b>ROMO – Robotics for Moving Objects within manufacturing and healthcare.</b> Funding for 1 PhD student, budget 3.5 MNOK
2015-2023	<b>SFI Manufacturing.</b> Funding for 4 PhD-students and 4 years of post.doc on robotics, budget 19.7MNOK (total budget 192MNOK)



- 2013-2016 **Nanopositioning**, Funding from NTNU/IME Lighthouse project on robotics for one PhD-student
- 2011-2014 **KMB project NextGenRob**, Funding for 1 PhD-student and 2 years of post.doc.
- 2010-2013 **DANTEQ**, KMB project, funded by Sintef Aquaculture and fisheries. Funding for 1 PhD-student.
- 2010-2013 **Improvedo**, KMB project, funded by NFR, Rolls Royce Marine and Sintef Aquaculture and fisheries. Funding for 1 PhD-student.
- 2009-2013 **Strategic university program (SUP) on Control, Information and Communication Systems for Environmental and Safety Critical Systems**
- 2008-2012 **SIEMENS-NTNU cooperative project**. Control of compressors, funding for 1 Adjunct professor, 1 PhD-student and laboratory.
- 2008-2014 **Nanopositioning**, Funding from NTNU for one PhD-student, 2 years of post.doc training, and a 1.6 MNOK grant for lab.equipment
- 2007- **GEMINI Centre**. Member of the NTNU/SINTEF Gemini centre *Advanced Robotics* 2007. The centre was established in 2007.
- 2006 -2010 **TAIL, BIP project**. Project: Robotics technology for supplementing and extending human inspection and intervention capabilities. Project partners: ABB, IBM, Statoil, Aker Kværner Offshore Partner, IFE, Marintek and NTNU. 2006-2009.
- 2006 **AUVSAT** Underwater vehicles for synchronization of formations of advanced autonomous underwater vehicles (AUVs) and satellites. Budget 1.4MNOK.
- 2004-2009 **Strategic University Program on Computational Methods in Nonlinear Motion Control**. The program comprises 13 PhD students and 3 Post.doc researchers. I supervise 3 of the PhD students. Total SUP budget: 26.6 MNOK
- 2004-2006 **Compressor Control Laboratory**, Funding from NTNU, Statoil/Gas Technology Centre and the research council. Total Budget: 0.6 MNOK.
- 2003- **Student Space Exploration & Technology Initiative (SSETI)** Supervisor for the NTNU-team working on ADCS on this European Space Agency (ESA) project. Partners: SSETI, ESA, Norwegian Space centre, HiN, Kongsberg D&A
- 2001 **Load-sharing for Compressors (ABB)**. Post-doctoral research financed by ABB. Analysis and simulation of a new concept for load-sharing of compressors.
- 2001-2004 **Ncube I & II-Norwegian student satellites**  
Supervisor for the Attitude Determination and Control System (ADCS) subtask of the Ncube projects. Partners: Norwegian Space centre, Andøya Rocket Range, NAROM, NTNU, HiN, NHL. Industrial partners: FFI, Kongsberg D&A and Telenor.
- 1999-2001 **Active control of compressors**. Post-doctoral research financed by ABB Industry AS.

### Editor in journals

- Associate Editor IEEE Transactions on Control Systems Technology, 2020-
- Member of the editorial board, "Mechanics and Mechanical Engineering", <http://www.kdm.p.lodz.pl/mme.html> , 2020-
- Senior Editor for IFAC Mechatronics, Elsevier, 2017- 2021
- Associate Editor IFAC Mechatronics, Elsevier, 2016-2017
- Editorial board member for the journal Simulation Modelling Practice and Theory, Elsevier, 2007-2011
- Guest editor for Modeling Identification and Control, No. 2, 3 and 4, vol.27, 2006. Special issues in connection with the 46th Scandinavian Conference on Modeling and Simulation. Editorial, Modeling, Identification and Control, pp.77, vol. 27, no.2, 2006

### Membership in Academic and Professional Organizations and Committe

- 2017 Member of the Norwegian Academy of Technological Sciences
- 2016- Member of [IFAC Technical Committee on Mechatronic Systems](#)
- 2012- Member of [IFAC Technical Committee on Nonlinear Control System](#)

- 1993- [IEEE: Institute of Electrical and Electronics Engineers](#), Control Systems Society and Robotics & Automation Society. (Senior member since 2004)  
1992- Member of the [Norwegian Society of Chartered Engineers \(Tekna\)](#)

## **Reviewer**

*Reviewer of books for*  
Springer Verlag  
Wiley

### *Reviewer for Journals:*

Acta Astronautica  
Aerospace Science and Technology  
Aircraft Engineering and Aerospace Technology  
AIAA Journal of Guidance, Control, and Dynamics  
ASME Journal of Dynamics, Measurement and Control  
ASME Journal of Mechanisms and Robotics  
Automatica  
Biosystems Engineering  
Chinese Journal of Aeronautics  
Control and Cybernetics  
Control Engineering Practise  
Engineering Applications of Artificial Intelligence  
European Journal of Control  
IEE Proceedings: Control theory and applications (and IET Control Theory & Applications)  
IEEE Control Systems Magazine  
IEEE Transactions on Automatic Control  
IEEE Transactions on Automation Science and Engineering  
IEEE Transactions on Control Systems Technology  
IEEE Transactions on Fuzzy Systems  
IEEE Transactions on Nanotechnology  
IEEE Transactions on Robotics  
IEEE/ASME Transactions on Mechatronics  
International Journal of Advanced Robotic Systems  
International Journal of Control  
International Journal of Robust and Nonlinear Control  
International Journal of Systems Science  
ITB Journal  
Journal of Aerospace Engineering  
Journal of Electronic Science and Technology  
Journal of Rotating Machinery  
Journal of Sound and Vibration  
Journal of the Astronautical Sciences  
Modeling, Identification and Control  
Proc. of the Inst. of Mechanical Engineers, Part I, Journal of Systems and Control Engineering  
Sensors & Actuators: A. Physical  
Simulation Modelling Practice and Theory  
Systems and Control Letters

### *Reviewer for Conferences:*

ASME Dynamic Systems and Control Conference (DSCC)  
ASME Turbo Expo

IEEE Conference on Decision and Control (CDC)  
IEEE Conference on Control Applications (CCA)  
IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)  
IEEE Multi-conference on Systems and Control (MSC)  
IFAC Symposium on Mechatronic Systems  
IFAC SYSID  
IFAC Workshop on Automatic Control in Offshore Oil and Gas Production (ACOOG)  
IFAC Symposium on Automatic Control in Aerospace (ACA)  
IFAC Conference on Advances in PID Control  
IFAC Safeprocess  
IFAC World Congress  
American Control Conference (ACC)  
European Control Conference (ECC)  
Scandinavian Conference on Modeling and Simulation (SIMS)  
Mediterranean Conference on Control & Automation (MED)  
International Conference on Control, Automation, Robotics and Vision (ICARCV)  
International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH),  
International Conference on Robotics and Automation (ICRA)  
International Conference on Intelligent Robots and Systems (IROS)  
Virtual Control Conference (VCC)

### **Supervision of MSc students**

161 MSc graduated (as of 2022). Detailed list at

[http://www.itk.ntnu.no/ansatte/Gravdahl\\_Jan.Tommy/MSc.html](http://www.itk.ntnu.no/ansatte/Gravdahl_Jan.Tommy/MSc.html)

# J.T. Gravdahl: Publications 1994-2023

## Books

1. J.T. Gravdahl and O. Egeland, "[Compressor surge and rotating stall: Modeling and control](#)", Series: Advances in Industrial Control, ISBN 978-1-4471-1211-2, Springer Verlag, London, 1999
2. O. Egeland and Gravdahl, J.T., "[Modeling and simulation for automatic control](#)", Marine Cybernetics, Trondheim, 2002
3. P. Liljebäck, K.Y. Pettersen, Ø. Stavdahl and J.T. Gravdahl, "[Snake Robots: Modelling, Mechatronics, and Control](#)", Series: Advances in Industrial Control, ISBN: 978-1-4471-2995-0, Springer-Verlag, 2013
4. P.J. From, J.T. Gravdahl and K.Y. Pettersen, "[Vehicle-Manipulator Systems: Modeling for Simulation, Analysis, and Control](#)", Series: Advances in Industrial Control, ISBN 978-1-4471-5462-4, Springer-Verlag, London, 2014

## Edited volumes

1. J.A. Amundsen, H.I. Andersson, E. Celledoni, J.T. Gravdahl, H. Nagel and T. Natvig (Eds.), "[SIMS 2005, 46th Conference on Simulation and Modeling](#)", ISBN 82-519-2093-0, Tapir Akademisk Forlag, Trondheim, 2005
2. K.Y. Pettersen, Gravdahl, J.T.; Nijmeijer, H. (Eds.), "[Group Coordination and Cooperative Control](#)", Series: Lecture Notes in Control and Information Sciences, Vol. 336, ISBN: 3-540-33468-8, Springer Verlag, Heidelberg, 2006

## Journal papers

### **Published**

1. E.T.B. Lundby, A. Rasheed, J.T. Gravdahl and I.J. Halvorsen, Sparse deep neural networks for modeling aluminum electrolysis dynamics, Applied Soft Computing, Volume 134, 2023,
2. K. Seel, A.B. Kordabad, S. Gros and J.T. Gravdahl, Convex Neural Network-based Cost Modifications for Learning Model Predictive Control, IEEE Open Journal of Control Systems (OJ-CSYS), vol. 1, pp. 366-379, 2022
3. M.R.P. Ragazzon, S. Messineo, J.T. Gravdahl, D. Harcombe, M.G. Ruppert, The Generalized Lyapunov Demodulator: High-Bandwidth, Low-Noise Amplitude and Phase Estimation, 2022, IEEE Open Journal of Control Systems (OJ-CSYS), 2022
4. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, The generalized super-twisting algorithm with adaptive gains, International Journal of Robust and Nonlinear Control, 32(13), pp. 7240--7270. 2022
5. L.D. Evjemo, G. Langelandsvik, S. Moe, M.H. Danielsen and J.T. Gravdahl, Wire-arc additive manufacturing of structures with overhang: Experimental results depositing material onto fixed substrate, CIRP Journal of Manufacturing Science and Technology, Vol. 38, pp. 186-203, August, 2022
6. M.E. Grøtte, R. Birkeland, E. Honoré-Livermore, S. Bakken, J.L. Garrett, E.F. Prentice, F. Sigernes, M. Orlandic, J.T. Gravdahl and T.A. Johansen, Ocean Color Hyperspectral Remote Sensing with High Resolution and Low Latency – the HYPSON-1 CubeSat Mission, IEEE Transactions on Geoscience and Remote Sensing (TGRS), 2021, DOI:10.1109/TGRS.2021.3080175
7. S. Messineo, M.R.P. Ragazzon, F. Busnelli, J.T. Gravdahl, Analysis of PI-control for Atomic Force Microscopy in Contact Mode, IEEE Transactions on Control Systems Technology (T-CST), 2021
8. B.A. Kristiansen, J.T. Gravdahl, T.A. Johansen, Energy optimal attitude control for a solar-powered spacecraft, European Journal of Control, July, 2021
9. E.T.B. Lundby, A. Rasheed, J.T. Gravdahl and I.J. Halvorsen, A novel hybrid analysis and modelling approach with application to the aluminum extraction process, J. of process control, vol. 105, pp. 62--77, 2021

10. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, Comparison of two second-order sliding mode control algorithms for an articulated intervention-AUV: Theory and experimental results, *Ocean Engineering*, vol 222, 2021, DOI: 10.1016/j.oceaneng.2020.108480
11. C.J. Backi, S. Skogestad and J.T. Gravdahl, Combined State and Parameter Estimation for not Fully Observable Dynamic Systems, *IFAC Journal of Systems and Control*, vol 13, September, 2020, DOI: 10.1016/j.ifacsc.2020.100103
12. S. Moe, K.Y. Pettersen and J.T. Gravdahl, Set-based Collision Avoidance: Application to robotic systems, *Mechatronics*, vol. 69, August, 2020, DOI: 10.1016/j.mechatronics.2020.102399
13. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, Combined Kinematic and Dynamic Control of Vehicle-Manipulator Systems, *Mechatronics*, vol. 69, August, 2020, DOI: 10.1016/j.mechatronics.2020.102380
14. Å.V. Neverlien, S. Moe and J.T. Gravdahl, Compressor Surge Control Using Lyapunov Neural Networks, *Modeling, Identification and Control (MIC)*, 41(2), pp.41--49, 10.4173/mic.2020.2.1
15. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, Tracking control of an articulated intervention AUV in 6DOF using generalized super-twisting: Theory and Experiments, *IEEE Transactions on Control Systems Technology (T-CST)*, 1-17, 2020, 10.1109/TCST.2020.2977302
16. E. Oland, R. Kristiansen. J.T. Gravdahl, A Comparison Study of Different Control Structures for Flight Control with New Results, *IEEE Transactions on Control Systems Technology (T-CST)*, 28(2), pp. 291--305, 2020, DOI: 10.1109/TCST.2018.2873507
17. M.R.P. Ragazzon, J. T. Gravdahl and K.Y. Pettersen, Model-based identification of nanomechanical properties in atomic force microscopy: Theory and experiments, *IEEE Transactions on Control Systems Technology*, 27(5), pp. 2045--2057, 2019 DOI: 10.1109/TCST.2018.2847644
18. E. Kelasidi, S. Moe, K.Y. Pettersen, A.M. Kohl, P. Liljebäck and J.T. Gravdahl, Path Following, Obstacle Detection and Obstacle Avoidance for Thrusted Underwater Snake Robots, *Frontiers in Robotics and AI*, July, 2019, DOI: 10.3389/frobt.2019.00057
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20. E. Kelasidi, A.M. Kohl, K.Y. Pettersen, B.H. Hoffmann, J.T. Gravdahl, Experimental Investigation of Locomotion Efficiency and Path-Following for Underwater Snake Robots with and without a Caudal Fin, *Annual Reviews in Control*, 2018, DOI: 10.1016/j.arcontrol.2018.10.001
21. T. Utstumo, F. Urdal, A. Brevik, J. Dørum, J. Netland, Ø. Overskeid, T.W. Berge and J.T. Gravdahl, Robotic in-row weed control for vegetables, *Computers and Electronics in Agriculture*, vol 154, pp. 36-45, 2018, DOI: 10.1016/j.compag.2018.08.043
22. S. Moe, J.T. Gravdahl and K.Y. Pettersen, Set-based control for autonomous spray painting, *IEEE Transactions on Automation Science and Engineering (T-ASE)*, 15(4), pp. 1785--1796, October, 2018, DOI: 10.1109/TASE.2018.2801382
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24. E. Kelasidi, M. Jesmani, K.Y. Pettersen and J.T. Gravdahl, Locomotion efficiency optimization of biologically inspired snake robots, *Applied Sciences*, 8(1), 2018, DOI: 10.3390/app8010080
25. M.R.P. Ragazzon, M. Vagia, J.T. Gravdahl, Viscoelastic Properties of Cells: Modeling and Identification by Atomic Force Microscopy, *Mechatronics*, 2017, DOI: 10.1016/j.mechatronics.2017.09.011
26. J. Sverdrup-Thygeson, E. Kelasidi, K. Y. Pettersen and J. T. Gravdahl, The underwater swimming manipulator - A bio-inspired solution for subsea operations, *IEEE Journal of Oceanic Engineering*, DOI: 10.1109/JOE.2017.2768108
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35. Y.R. Teo, A.J. Fleming, A.A. Eielson, J.T. Gravdahl, A simplified method for discrete-time repetitive control using model-less FIR filter inversion, Journal of Dynamic Systems Measurement and Control, 138(8), May 2016, DOI: [10.1115/1.4033274](https://doi.org/10.1115/1.4033274)
36. E. Kelasidi, P. Liljebäck, K.Y. Pettersen and J. T. Gravdahl, Innovation in Underwater Robots: Biologically Inspired Swimming Snake Robots, IEEE Robotics and Automation Magazine, 23(1), March, 2016, pp. 44-62, DOI: [10.1109/MRA.2015.2506121](https://doi.org/10.1109/MRA.2015.2506121).
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39. E. Kelasidi, P. Liljebäck, K.Y. Pettersen and J. T. Gravdahl, Experimental Investigation of Efficient Locomotion of Underwater Snake Robots, Robotics and Biomimetics, 2(8), 2015, DOI: [10.1186/s40638-015-0029-4](https://doi.org/10.1186/s40638-015-0029-4)
40. M. Tuffaha and J.T. Gravdahl, [Control-Oriented Model of a Generating Set comprising a Diesel Engine and A synchronous Generator](#), [Modeling, Identification and Control \(MIC\)](#), 2015, Vol 36, No 4, pp.199-214
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66. Kristiansen R., P.J. Nicklasson and J.T. Gravdahl, [Satellite Attitude Control by Quaternion-Based Backstepping](#), IEEE Transactions on control systems technology (T-CST), 17(1), pp. 227-232, January 2009
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## **Conference papers**

1. E.A. Basso, H.M. Schmidt-Didlaukies, K.Y. Pettersen and J.T. Gravdahl, Synergistic PID and Output Feedback Control on Matrix Lie Groups, Proc. 12th IFAC Symposium on Nonlinear Control Systems (NOLCOS), Canberra, Australia, Jan. 4-6, 2023, Awarded Best Student Paper Award
2. A.S. Anand, F. Abu-Dakka, F and J.T. Gravdahl, Addressing Sample Efficiency and Model-bias in Model-based Reinforcement Learning. In 21st IEEE International Conference on Machine Learning and Applications (IEEE ICMLA), Bahamas, December 12-14, 2022



3. A. Orucevic, J.T. Gravdahl, K.Y. Pettersen and A. Chaillet, Uniform Practical Asymptotic Stability for Position Control of Underwater Snake Robots, 6th IEEE Conference on Control Technology and Applications, August 23 – 25, Trieste, Italy
4. B.K. Sæbø, J.T. Gravdahl and K.Y. Pettersen, Robust Task-Priority Impedance Control for Vehicle-Manipulator Systems, 6th IEEE Conference on Control Technology and Applications, August 23 – 25, Trieste, Italy
5. S.K. Schaanning, B.A. Kristiansen and J.T. Gravdahl, Maximum hands off attitude control, 2022 American Control Conference (ACC), June 8-11, Atlanta, GA
6. A.S. Anand, M.H. Myrestrand, J.T. Gravdahl, Evaluation of Variable Impedance- and Hybrid Force/Motion-Controllers for Learning Force Tracking Skills, 2022 IEEE/SICE International Symposium on System Integration (SII), Narvik, Norway (digital)
7. A.S. Anand, A. Østvik, E.I. Grøtli, M. Vagia, J.T. Gravdahl, Real-time temporal adaptation of dynamic movement primitives for moving targets, 20th International Conference on Advanced Robotics (ICAR), December 6-10, 2021, Ljubljana, Slovenia.
8. K. Seel, M.M. Haring, E.I. Grøtli, K.Y. Pettersen and J.T. Gravdahl, Learning-based Robust Model Predictive Control for Sector-bounded Lur'e Systems, accepted for the 2021 Modeling, Estimation, and Control Conference (MECC 2021), Online and University of Texas at Austin, USA
9. J.A. Olsen, M.E. Grøtte and J.T. Gravdahl, Attitude determination and control system testbed for hardware and software testing and validation for HYPSON small satellites, 72nd International Astronautical Congress, Dubai, United Arab Emirates, 25 – 29 October 2021
10. C. Sterud, S. Moe and J.T. Gravdahl, Stable and robust neural network controllers, European Control Conference (ECC), Rotterdam, NL (Virtual), June 29 - July 2, 2021
11. B.A. Kristiansen, J.T. Gravdahl, T.A. Johansen, Energy optimal attitude control for a solar-powered spacecraft, European Control Conference (ECC), Rotterdam, NL (Virtual), June 29 - July 2, 2021
12. A. Moltumyr, M.H. Arbo, J.T. Gravdahl, Output Maneuvering for Cartesian 3D Printer, European Control Conference (ECC), Rotterdam, NL (Virtual), June 29 - July 2, 2021
13. F. Viset, J.T. Gravdahl and M. Kok, Magnetic field norm SLAM using Gaussian process maps in foot-mounted sensor, European Control Conference (ECC), Rotterdam, NL (Virtual), June 29 - July 2, 2021
14. K. Seel, E.I. Grøtli, S. Moe, J.T. Gravdahl and K.Y. Pettersen, Neural Network Based Model Predictive Control with Stability Guarantees, American Control Conference, 2021
15. M. Arbo, I. Eriksen, F. Sanfilippo, J.T. Gravdahl, Comparison of KVP and RSI for Controlling KUKA Robots Over ROS, 21st IFAC World Congress, Berlin, Germany, July 12-17, 2020
16. I.F. Onstein, L.D. Evjemo and J.T. Gravdahl, Additive Manufacturing Path Generation for Robot Manipulators Based on CAD Models, 21st IFAC World Congress, Berlin, Germany, July 12-17, 2020
17. A.H. Moltumyr, M.R.P. Ragazzon and J.T. Gravdahl, Fractional-order Control: Nyquist Constrained Optimization, 21st IFAC World Congress, Berlin, Germany, July 12-17, 2020
18. L.D. Evjemo, S. Moe and J.T. Gravdahl, Robotised Wire Arc Additive Manufacturing Using Set-based Control: Experimental Results, 21st IFAC World Congress, Berlin, Germany, July 12-17, 2020
19. B.A. Kristiansen, M.E. Grøtte and J.T. Gravdahl, Quaternion-Based Generalized Super-Twisting Algorithm for Spacecraft Attitude Control, 21st IFAC World Congress, Berlin, Germany, July 12-17, 2020
20. M.E. Grøtte, J.T. Gravdahl, T.A. Johansen, E.M. Vidal and E. Surma, Spacecraft Attitude Stabilization and Slew Maneuver Feedback Controllers using Reaction Wheels, 21st IFAC World Congress, Berlin, Germany, July 12-17, 2020
21. S. Moe, F. Remonato, E.I. Grøtli and J.T. Gravdahl, Linear Antisymmetric Recurrent Neural Networks, Learning for Dynamics and Control (L4DC), June 10-11th, 2020, University of California, Berkeley, CA
22. A.H. Moltumyr, M.H. Arbo and J.T. Gravdahl, Towards Vision-based Closed-loop Additive Manufacturing: A Review, 3rd International Symposium on Small-scale Intelligent Manufacturing Systems (SIMS), June 10-12, 2020, Gjøvik, Norway.

23. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, The generalized super-twisting algorithm with adaptive gains, European Control Conference, Saint Petersburg, Russia, May 12-15, 2020, Finalist for Best Student Paper Award
24. M. Wrzos-Kaminska, T. Mylvaganam, K.Y. Pettersen and J.T. Gravdahl, Collision Avoidance using Mixed  $H_2/H_\infty$  Control for an Articulated Intervention-AUV, European Control Conference, Saint Petersburg, Russia, May 12-15, 2020
25. L.M.G. Johannessen, M.H.Arbo and J.T. Gravdahl, Robot Dynamics with URDF and CasADi, The 7th International Conference on Control, Mechatronics and Automation, TU Delft, Netherlands, November 6-8, 2019
26. M.A. Astad, M.H. Arbo, E.I. Grøtli and J.T. Gravdahl, Vive for Robotics: Rapid Robot Cell Calibration, The 7th International Conference on Control, Mechatronics and Automation, TU Delft, Netherlands, November 6-8, 2019
27. I.-L.G., Borlaug, J. Sverdrup-Thygeson, K.Y. Pettersen, J.T. Gravdahl, Combined kinematic and dynamic control of an underwater swimming manipulator, Joint 12th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles 1st IFAC Workshop on Robot Control, KAIST, Daejeon, Korea, September 18-20, 2019
28. M.R.P. Ragazzon, S. Messineo, J.T. Gravdahl, D. Harcombe, M.G. Ruppert, Generalized Lyapunov Demodulator for Amplitude and Phase Estimation by the Internal Model Principle, 8th IFAC Symposium on Mechatronic Systems, Vienna, 2019
29. M. Wrzos-Kaminska, K.Y. Pettersen and J.T. Gravdahl, Path following control for articulated intervention-AUVs using geometric control of reduced attitude, 11th IFAC Symposium on Nonlinear Control Systems (NOLCOS), Vienna, 2019.
30. L.D. Evjemo, G. Langelandsvik and J.T. Gravdahl, Wire Arc Additive Manufacturing by Robot Manipulator: Towards creating complex geometries, 5th IFAC International Conference on Intelligent Control and Automation Science (ICONS), Belfast, Northern Ireland, August 21-23, 2019
31. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, Tracking control of an articulated intervention-AUV in 6DOF using the generalized super-twisting algorithm, American Control Conference, Philadelphia, PA, July 10-12, 2019.
32. M.R.P. Ragazzon, J.T. Gravdahl, K.Y. Pettersen, Model-Based Identification of Nanomechanical Properties in Atomic Force Microscopy, International Conference on Manipulation, Automation and Robotics at Small Scales (MARSS2019), July 1–5, 2019 in Helsinki, Finland.
33. V. Hassani, S. Fjellvang, Ø. Auestad, J.T. Gravdahl, Adaptive Boarding Control System in Surface Effect Ships, European Control Conference, Napoli, Italia, June 25-28, 2019
34. W. Caharija, A.J. Sørensen, K.Y. Pettersen, M. Greco, J.T. Gravdahl, Path Following Control of Underactuated Surface Vessels in the Presence of Multiple Disturbances, European Control Conference, Napoli, Italia, June 25-28, 2019
35. I.-L. G. Borlaug, K.Y. Pettersen and J.T. Gravdahl, Trajectory tracking for an articulated intervention AUV using a super twisting algorithm in 6 DOF, 2018 IFAC Conference on Control Applications in Marine Systems (CAMS), September, 2018, Opatija, Croatia
36. J. Tønnesen, H.Å. Bryn, J.T. Gravdahl, V. Hassani, Ø.F. Auestad, Roll damping of a surface effect ship with split air cushion, 2018 IFAC Conference on Control Applications in Marine Systems (CAMS), September, 2018, Opatija, Croatia
37. M.H. Arbo and J.T. Gravdahl, Stability of the Tracking Problem with Task-Priority Inverse Kinematics, In Proc. of the IFAC Symposium on robot control, SYROCO, Budapest, August 27-30, 2018
38. C.J. Backi, J.T. Gravdahl and S. Skogestad, A method for parameter identification of nonlinear dynamics systems without full observability, proc. of IFAC Conference on Modeling, Identification and Control of Nonlinear Systems, MICNON 2018, June 20-22, 2018, Guadalajara, Mexico
39. A.M. Kohl, S. Moe, E. Kelasidi, K.Y. Pettersen and J.T. Gravdahl, Set-based path following and obstacle avoidance for underwater snake robots, proc. IEEE int. conference on robotics and biomimetics (Robio), Macau, China, Dec. 5-8, 2017, Awarded the **Best Conference Paper Award** at Robio 2017
40. I.-L. G. Borlaug, J.T. Gravdahl, J. Sverdrup-Thygeson and K.Y. Pettersen, Trajectory tracking for underwater swimming manipulators using a super twisting algorithm, *Proc. 2nd International*

- Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM 2017)*, Kyoto, Japan, Oct, 2017,
41. L.D. Evjemo, S. Moe, J.T. Gravdahl, O. Roulet-Dubonnet, L.T. Gellein and V. Brøtan, Additive manufacturing by robot manipulator: An overview of the state-of-the-art and proof-of-concept results, 22nd IEEE International Conference on Emerging Technologies and Factory Automation, September 12-15, 2017, Limassol, Cyprus
  42. A.M. Kohl, K.Y. Pettersen and J.T. Gravdahl, Forward velocity and heading control of underwater snake robots using absolute velocity feedback, 1st IEEE Conference on Control Technology and Applications (CCTA), Kohala Coast, Hawai'i, August 27-30, 2017
  43. E. Kelasidi, K.Y. Pettersen, J. T. Gravdahl, S. Strømsøyen and A.J. Sørensen, Modeling and propulsion methods of underwater snake robots, 1st IEEE Conference on Control Technology and Applications (CCTA), Kohala Coast, Hawai'i, August 27-30, 2017
  44. J. Sverdrup-Thygeson, S. Moe, K. Y. Pettersen and J. T. Gravdahl, Kinematic singularity avoidance for robot manipulators using set-based manipulability tasks, 1st IEEE Conference on Control Technology and Applications (CCTA), Kohala Coast, Hawai'i, August 27-30, 2017
  45. M.H. Arbo, E.I. Grøtli, J.T. Gravdahl, Mid-Level MPC and 6 DOF Output Path Following for Robotic Manipulators, 1st IEEE Conference on Control Technology and Applications (CCTA), Kohala Coast, Hawai'i, August 27-30, 2017
  46. M.R.P. Ragazzon, J. T. Gravdahl and K.Y. Pettersen, Exponential convergence bounds in least squares estimation: Identification of viscoelastic properties in atomic force microscopy, 1st IEEE Conference on Control Technology and Applications (CCTA), Kohala Coast, Hawai'i, August 27-30, 2017, **Finalist for Best Paper Award**
  47. M.H. Arbo, E.I. Grøtli, J.T. Gravdahl, On model predictive path following and trajectory tracking for industrial robots, IEEE CASE 2017, 13th IEEE Conference on Automation Science and Engineering, August 20-23, 2017 Xi'an, China
  48. N. Uddin and J.T. Gravdahl, Compressor surge control design using linear matrix inequality approach, In proc. of the 5th international conference on Instrumentation, Control and Automation (ICA), August 9-11, 2017, Yogyakarta, Indonesia
  49. E. Kelasidi, K.Y. Pettersen, A.M. Kohl and J. T. Gravdahl, An experimental investigation of path following for an underwater snake robot with caudal tail, IFAC World Congress, Toulouse, France, July 2017
  50. M.H. Arbo, E.I. Grøtli, J.T. Gravdahl, On the globally exponentially stable invariance and immersion speed observer for mechanical systems, American Control Conference, Seattle, May, 2017
  51. E. Kelasidi, K.Y. Pettersen, P. Liljebäck and J. T. Gravdahl, Locomotion efficiency of underwater snake robots with thrusters, Int. Symposium on safety, security and rescue robotics, EPFL, Lausanne, Switzerland, October 23-27, 2016
  52. J. Sverdrup-Thygeson, E. Kelasidi, K. Y. Pettersen and J. T. Gravdahl, The underwater swimming manipulator - A bio-inspired AUV, IEEE AUV, Tokyo, Japan, 6-9 November 2016
  53. C.J. Backi, J.T. Gravdahl and S. Skogestad, Robust control of a two-state Greitzer compressor model by state-feedback linearization, in proceedings of the IEEE Multi-Conference on Systems and Control 2016, Buenos Aires, Argentina, September 19-22, 2016
  54. M.R.P. Ragazzon, J.T.Gravdahl, Imaging topography and viscoelastic properties by constant depth atomic force microscopy, in proceedings of the IEEE Multi-Conference on Systems and Control 2016, Buenos Aires, Argentina, September 19-22, 2016
  55. J. Sverdrup-Thygeson, E. Kelasidi, K. Y. Pettersen and J. T. Gravdahl, A control framework for biologically inspired underwater swimming manipulators equipped with thrusters, in proceedings of the 10th IFAC Conference on Control Applications in Marine Systems (CAMS 2016), Trondheim, Norway, September 13-16, 2016
  56. J. Sverdrup-Thygeson, E. Kelasidi, K. Y. Pettersen and J. T. Gravdahl, Modeling of underwater swimming manipulators, in proceedings of the 10th IFAC Conference on Control Applications in Marine Systems (CAMS 2016), Trondheim, Norway, September 13-16, 2016
  57. M.R.P. Ragazzon, M. Vagia, J.T.Gravdahl, Cell Mechanics Modeling and Identification by Atomic Force Microscopy, in proceedings of MECHATRONICS 2016: 7th IFAC Symposium on

- Mechatronic Systems & 15th Mechatronics Forum International Conference, Loughborough University, England, 5th - 8th September 2016
58. M.R.P. Ragazzon, J.T. Gravdahl, and A.J. Fleming, On Amplitude Estimation for High-Speed Atomic Force Microscopy, in proceedings of the 2016 American Control Conference, Boston, July, 2016
  59. N. Uddin and J.T. Gravdahl, Two General State Feedback Control Laws for Compressor Surge Stabilization, in proceedings of the 24th Mediterranean Conference on Control and Automation, Athens, Greece, June, 2016
  60. S. Moe, K.Y. Pettersen, T.I. Fossen, J.T. Gravdahl, Line-of-Sight Curved Path Following for Underactuated USVs and AUVs in the Horizontal Plane under the influence of Ocean Currents, in proceedings of the 24th Mediterranean Conference on Control and Automation, Athens, Greece, June, 2016
  61. M. Vagia, A.A.Eielsen, J.T. Gravdahl, K.Y. Pettersen, Nonlinear Tracking Control Scheme for a Nanopositioner, in proceedings of the 24th Mediterranean Conference on Control and Automation, Athens, Greece, June, 2016
  62. E. Kelasidi, A.M. Kohl, K.Y. Pettersen, J.T. Gravdahl, Waypoint guidance control for underwater snake robots exposed to ocean currents, in proceedings of the 24th Mediterranean Conference on Control and Automation, Athens, Greece, June, 2016
  63. C.J. Backi, J. Leth and J.T. Gravdahl, [Optimal and Model Predictive Control for a novel thawing method for foodstuff](#), Proceedings of the 11th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (DYCOPS-CAB 2016), Trondheim, Norway, June 6-8, 2016
  64. N. Uddin and J.T. Gravdahl, [Piston actuated active surge control system: Implementation and experimental results](#), Proceedings of the 11th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (DYCOPS-CAB 2016), Trondheim, Norway, June 6-8, 2016
  65. A.M. Kohl, E. Kelasidi, K.Y. Pettersen and J.T. Gravdahl, Analysis of underwater snake robot locomotion in the presence of ocean currents, Proceedings of the 2015 IEEE International Conference on Robotics and Biomimetics, Zhuhai, China, December 6-9, 2015
  66. E. Kelasidi, M. Jesmani, K. Y. Pettersen and J. T. Gravdahl, Multi-objective optimization for efficient motion of underwater snake robots, *Proc. 1st International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM 2015)*, Kyoto, Japan, Oct. 28-30, 2015
  67. E. Rezapour, K.Y. Pettersen, J. T. Gravdahl and A. Hofmann, Cross-Track Formation Control of Underactuated Bio-inspired Snake Robots, *Proc. 1st International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM 2015)*, Kyoto, Japan, Oct. 28-30, 2015
  68. J. Dørum, T. Utstumo, J.T. Gravdahl, [Experimental comparison of adaptive controllers for trajectory tracking in agricultural robotics](#), Proc. 19th International Conference on System Theory, Control and Computing, Cheile Gradistei - Fundata Resort, Romania, October 14-16, 2015
  69. A.M. Kohl, E. Kelasidi, K.Y. Pettersen and J.T. Gravdahl, A control-oriented model of underwater snake robots exposed to currents, *Proc. 2015 IEEE Multi-Conference on Systems and Control*, Sydney, Australia, September 21-23, 2015.
  70. Ø.F. Auestad, J.W. McFann, and J.T. Gravdahl. [Full-scale performance of the SES Motion Control System](#), 13th International Conference on Fast Sea Transportation (FAST 2015), FHI 360 Conference Center, Washington, D.C., 1-4 September, 2015
  71. Ø.F. Auestad, T. Perez, J.T. Gravdahl, A. Sørensen and T.H. Espeland, Boarding Control System - for Improved Accessibility to Offshore Wind Turbines, In proceedings of the 10th IFAC Conference on Manoeuvring and Control of Marine Craft (MCMC'2015), Copenhagen, Denmark, August 24-26, 2015. **Awarded Best Student Paper at the 2015 IFAC MCMC**
  72. E. Kelasidi, K.Y. Pettersen and J. T. Gravdahl, Energy efficiency of underwater robots, In proceedings of the 10th IFAC Conference on Manoeuvring and Control of Marine Craft (MCMC'2015), Copenhagen, Denmark, August 24-26, 2015
  73. M.R.P. Ragazzon, J.T. Gravdahl, K.Y. Pettersen, and A.A. Eielsen, Topography Estimation in Atomic Force Microscopy by State and Parameter Estimation, *Proc. 2014 American Control Conference*, Chicago, IL, July 1 – 3, 2015.
  74. C.J. Backi, J.D. Bendtsen, J. Leth and J.T. Gravdahl, Stability properties of a nonlinear heat equation with state-dependent parameters and asymmetric boundary conditions, Proc. Conference

- on Modeling, Identification and Control of Nonlinear Systems (MICNON-2015), Saint-Petersburg, Russia, June 24-26, 2015
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  76. T. Utstumo, T. Berge and J.T. Gravdahl, Non-linear Model Predictive Control for constrained robot navigation in row crops, in the Proceedings of the 2015 IEEE International Conference on Industrial Technology (ICIT 2015), Seville, Spain, March 17-19, 2015.
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  78. S. Gale, A.A. Eielsen and J.T. Gravdahl, Modelling and Simulation of a Flywheel Based Energy Storage System for an Industrial Manipulator, in the Proceedings of the 2015 IEEE International Conference on Industrial Technology (ICIT 2015), Seville, Spain, March 17-19, 2015.
  79. T. Utstumo, J. Dørum, M.H. Arbo, T.W. Berge, S. Goldberg, Ø. Overskeid and J.T. Gravdahl, [Asterix - Automatisk ugraskontroll i radkultur](#), Bioforsk-konferansen, Hamar, Norway, February 4-5, 2015
  80. C.J. Backi and J.T. Gravdahl, [A reduced observer design for a freezing process](#), the 19th Nordic Process Control Workshop, On the Coastal Steamer "Richard With" from Trondheim to Bodø, Norway, January 15-16, 2015
  81. F. Urdal, T. Utstumo, J.K. Vatne, S.Å. Ellingsen and J.T. Gravdahl, [Design and control of precision drop on demand herbicide application in agricultural robotics](#), in the Proceedings of the 13th International Conference on Control, Automation, Robotics and Vision, ICARCV 2014, Singapore, December 10-12, 2014
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  88. P. Liljebäck, K. Y. Pettersen, Ø. Stavdahl and J. T. Gravdahl, A 3D Motion Planning Framework for Snake Robots, in the Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014), Chicago, September, 2014
  89. E. Kelasidi, K.Y. Pettersen and J. T. Gravdahl, Modelling of underwater snake robots moving in a vertical plane of 3D, in the Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014), Chicago, September, 2014
  90. C. Holden, Ø. Stavdahl and J.T. Gravdahl, Optimal Dynamic Force Mapping for Obstacle-Aided Locomotion in 2D Snake Robots, in the Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014), Chicago, September, 2014
  91. C.J. Backi, J.D. Bendtsen, J. Leth and J.T. Gravdahl, [The nonlinear heat equation with state-dependent parameters and its connection to the Burgers' and the potential Burgers' equation](#), 19th World Congress of the International Federation of Automatic Control, IFAC, Cape Town, South Africa, August 24-29, 2014

92. Ø.F. Auestad, J.T. Gravdahl, A. Sørensen and T.H. Espeland, [Motion Compensation System for a Free Floating Surface Effect Ship](#), 19th World Congress of the International Federation of Automatic Control, IFAC, Cape Town, South Africa, August 24-29, 2014
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96. Y.R. Teo, A.A. Eielsen, J.T. Gravdahl, A.J. Fleming, Discrete-Time Repetitive Control With Model-Less FIR Filter Inversion for High Performance Nanopositioning, IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2014) , July 8-11, 2014, Besançon, France
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101. P.J. From, C.D. Pham, and J.T Gravdahl, [A Geometric Approach to Handling Torque Failure in Serial Manipulators and Closed Chain Manipulators with Passive Joints](#), 85th Annual Meeting of the International Association of Applied Mathematics and Mechanics, Erlangen, Germany, March 10-14, 2014
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103. E. Rezapour, K.Y. Pettersen, P. Liljebäck, and J. T. Gravdahl, Path Following Control of Planar Snake Robots Using Virtual Holonomic Constraints, in the proceedings of the 2013 IEEE International Conference Robotics and Biomimetics (IEEE-ROBIO 2013), Shenzhen, China, December 12-14, 2013. *IEEE-ROBIO 2013 Best Student Paper Award Finalist.*
104. M. Tuffaha and J.T. Gravdahl, Mixed-Integer Formulation of Unit Commitment problem for Isolated power systems with application to Marine Vessels, in the proceedings of the 52nd IEEE Conference on Decision and Control , Florence, Italy, December 10-13, 2013
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106. C.J. Backi and J.T. Gravdahl, Optimal boundary control for the heat equation with application to freezing with phase change, in the proceedings of the 2013 Australian Control Conference, AUCC 2013, Perth, Western Australia, November 4-5, 2013
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