

CURRICULUM VITAE

Professor Thor I. Fossen

Name:	Thor I. Fossen
Nationality:	Norwegian
Born:	1963-01-03
Present positions:	Professor, Department of Engineering Cybernetics, NTNU Co-Director, NTNU Centre of Autonomous Marine Operations and Systems
Entrepreneurship:	Co-founder of the company Marine Cybernetics AS (acquired by DNV GL) Co-founder of the company SCOUT Drone Inspection AS Owner at Cyber Invest AS, Idletechs AS, Waterlinked AS and SCOUT Drone Inspection AS
Home page:	http://www.fossen.biz
Amazon author page:	http://www.amazon.com/author/fossen

ACADEMIC DEGREES

- 1991 PhD Engineering Cybernetics (30 ECTS credits)
Postgraduate studies in Aerodynamics and Flight Control as a Fulbright Scholar (60 ECTS credits)
1987 MSc Marine Technology, NTNU (300 ECTS credits)

ACADEMIC CAREER/EMPLOYMENT

1993-pres.	Department of Engineering Cybernetics, NTNU, Trondheim	Professor
1991-1993	Department of Engineering Cybernetics, NTNU, Trondheim	Associate Professor
1990-1991	Department of Engineering Cybernetics, NTNU, Trondheim	Lecturer
1989-1990	University of Washington, USA	Fulbright Scholar

VISITING PROFESSOR:

2013	Department of Electrical Engineering, Technical University of Denmark
2002	Department of Applied Mech. & Eng. Sciences, UCSD, San Diego, USA
1999	Department of Control Engineering, Aalborg University, Denmark

INDUSTRIAL CAREER

2017-2019	SCOUT Drone Inspection AS, Trondheim	Vice President R&D
2002-2008	Marine Cybernetics AS, Trondheim	Vice President R&D
2004-2007	SINTEF Electronics and Cybernetics, Trondheim	Senior Scientific Advisor
2002-2003	Kongsberg Maritime AS, Kongsberg	Senior Scientific Advisor
1995-2002	ABB, Oslo	Senior Scientific Advisor
1999-2002	MARINTEK, Trondheim	Senior Scientific Advisor
1991-1998	SINTEF Automatic Control, Trondheim	Senior Scientific Advisor

HONORS

2016	IEEE Fellow
1998	Elected Member of the Norwegian Academy of Technological Sciences (NTVA)

APPOINTMENTS

2012-pres.	Co-director, NTNU Centre for Autonomous Marine Operations and Systems (AMOS)
2018	Industry Chair, IEEE Conference of Control Technology and Applications (CCTA'18)
2018	Associate Editor, International Conference on Unmanned Aerial Systems (ICUAS'18)
2014-2017	Member of the steering committee of the Int. Conf. on Unmanned Aerial Systems
2016	Vice-chair, IFAC CAMS'16, Norway

2013 Otto Mønsted Visiting Professor, Technical University of Denmark
 2008-2012 Head of Automatic Control, NTNU Centre for Ships and Ocean Structures
 2002-2012 Key Scientist, NTNU Centre for Ships and Ocean Structures
 2002-2010 Deputy Head, NTNU Department of Engineering Cybernetics
 1996-2000 Chair, IEEE Oceanic Eng. and Control Syst. Joint Society Chapter of the Norway Section
 1998 Chair, International Program Committee of IFAC CAMS'98, Fukuoka, Japan
 1995 Chair, National Organizing Committee (NOC) of IFAC CAMS'95, Norway

EDITOR

2017-2019 Associate Editor of the SNAME Journal of Ship Research
 2017-2019 Associate Editor of IFAC Control Engineering Practice (CEP)
 2002-2006 Associate Editor of Automatica

PLENARY AND KEYNOTE LECTURES

2017 "Nonlinear Observer Design and Strapdown Inertial Navigation Systems for Unmanned Aerial Vehicles". ELLIIT Workshop 2017, Lund University, Sweden.
 2016 "Nonlinear Observer Design for Strapdown Inertial Navigation Systems". 10th IFAC Symposium on Nonlinear Control Systems (NOLCOS'16), Monterey, CA, USA, 23-25 August 2016.
 2016 "Modelling and Control of Marine Craft", Tutorial Workshop at IFAC CAMS'06, Trondheim, Norway
 2012 "Nonlinear Observer Design for Strapdown Inertial Navigation", Workshop on Advanced Control and Diagnosis, ACD2012, Lyngby, Denmark
 2012 "Low-Cost Integrated Navigation Systems for AUVs", XXXIII Jornadas de Automatica, Spain
 2012 "Parametric Resonance: Frequency Detuning and Active Control", IFAC MCMC'2012, Italy
 2012 "Nonlinear Observers for Integration of Position and IMU Measurements", IFAC GNCUV'12, Porto, Portugal.
 2009 The 2009 Peachman Lecture, University of Michigan, USA.
 2007 "Modelling and Simulation of Marine System Dynamics", CAMS'07, Bol, Croatia.
 2006 "Time-Domain Models of Marine Surface Vessels for Simulation and Control Design based on Seakeeping Computations", MCMC'06, Lisbon, Portugal.
 2005 "A Nonlinear Unified State-Space Model for Ship Maneuvering and Control in a Seaway", Journal of Bifurcation and Chaos, ENOC'05 Plenary, The Netherlands
 2000 "A Survey on Nonlinear Ship Control: From Theory to Practice", Plenary Talk, 5th IFAC Conference on Maneuvering and Control of Marine Craft, Aalborg, Denmark.
 1999 "Nonlinear Passive Control and Observer Design for Ships", Tutorial Workshop, ECC'99, Brussels.
 1998 "Nonlinear Ship Control", Tutorial Workshop at IFAC CAMS'98, Fukuoka, Japan

PATENTS

NO 199885388 A method for automatic positioning of a vessel, 1998
 NO 20010397A A method and a device for controlling the position of an object, 2001
 NO 20010396A A method and a device for controlling the operation of a motor, 2001
 NO 20026284 A Method for testing and certification of the computer-based control and monitoring of a communication channel, 2002
 Pending Drone control system, 2018

FELLOWSHIPS

1993 Harry Borthens Fellowship on Ship Research
 1989 Fellowship from the "NATO Science Fellowship Program 20114"
 1989 Fulbright Scholarship
 1988 3-years PhD Scholarship from the Norwegian Research Council (program for robotic research)

BEST PAPER AWARDS

2015 Awarded the best regular paper award for "A Virtual-Vertical Reference Concept for GNSS/INS Applications at the Sea Surface" at IFAC MCMC'15, Copenhagen, Denmark.
 2008 Awarded the 2006 Arch T. Colwell Merit Award at the SAE World Congress for "Nonlinear Observer for Vehicle Velocity Estimation"
 2002 Awarded the Automatica best paper award for "Nonlinear Passive Weather Optimal Positioning Control System for Ships and Rigs: Experimental Results"

PHD GRADUATES WHO HAVE RECEIVED THE PRICE FOR BEST PHD THESIS AT NTNU

- 2005 Professor Roger Skjetne, Department of Marine Technology, NTNU
2003 Professor Ole Morten Aamo, Department of Engineering Cybernetics, NTNU
2000 Dr. Jann Peter Strand, Kongsberg

PHD CANDIDATES PRESENTLY UNDER MY SUPERVISION

1. **Fortuna, João**, Multivariate Analysis of Image Data using Heterogeneous Sensors and Environmental Data
2. **Coates, Erlend Magnus Lervik**. Nonlinear Autopilot Design for Extreme Maneuvers.
3. **Mathisen, Pål**. Sensor Fusion and Navigation System for Multicopter
4. **Dirdal, Johan**. Sea State Estimation and Automated Situational Awareness.
5. **Solnør, Petter**. Real-Time Encryption of Sensor and Communication Signals in Feedback Control Systems for Safe Operation of Autonomous Vehicles
6. **Volden, Øystein**. Real-Time Encryption of Computer Vision Feedback Control Systems for Autonomous Ships

DR. PHILOS GRADUATE

7. **Gade, Kenneth (2018)**. Inertial Navigation – Theory and Applications

PHD GRADUATES

8. **Fjellstad, Ola-Erik (1994)**. Control of UUVs in 6 DOF: A Quaternion Feedback Approach
9. **Lauvdal, Trygve (1998)**. Stabilization of Mechanical Systems in the Presence of Input Rate and Amplitude Saturations.
10. **Strand, Jann-Peter (1999)**. Nonlinear Position Control Systems for Marine Vessels
11. **Vik, Bjørnar (1999)**. Nonlinear Observer Designs for Strapdown INS/GPS
12. **Berge, Svein P. (1999)**. Nonlinear Waypoint Tracking Control and Docking of Ships
13. **Hansen, Jan Fredrik (2000)**. Optimal Power Control of Marine Systems
14. **Fard, Mehrdad P. (2001)**. Model-Based Control and Prediction of Vibrations in Marine Risers
15. **Aamo, Ole Morten (2002)**. Modeling and Control of Fluid Flows and Marine Structures
16. **Lindgaard, Karl Petter (2003)**. Acceleration Feedback in Dynamic Positioning Systems
17. **Skjetne, Roger (2005)**. The Maneuvering Problem
18. **Ihle, Ivar-Andre Flakstad (2006)**. Coordinated Control of Marine Craft
19. **Ross, Andrew (2008)**. Nonlinear Maneuvering Models for Ships: Lagrangian Approach
20. **Pivano, Luca (2008)**. System Identification and State Estimation in Marine Propellers
21. **Gullik A. Jensen (2010)**. Offshore Pipe-laying Dynamics
22. **Breivik, Morten (2010)**. Topics in Guided Motion Control of Marine Vehicles
23. **Hals, Jørgen (2010)**. Modeling and Control for Wave Energy Generation.
24. **Holden, Christian (2011)**. Modeling and Control of Parametric Roll Resonance
25. **Peymani, Ehsan (2013)**. Topics in Synchronization and Motion Control
26. **Breu, Dominik A. (2013)**. Frequency Detuning Control of Parametric Roll
27. **Lekkas, Anastasios (2014)**. Guidance and Path-Planning Systems for Autonomous Vehicles
28. **Leira, Frederik Stendhal (2017)**. Object Detection and Tracking with UAVs - A Framework for UAV Object Detection and Tracking using A Thermal Imaging Camera
29. **Hansen, Jakob Mahler (2017)**. Nonlinear Observers for Inertial Navigation Systems aided by Real-Time Kinematic Global Navigation Satellite Systems
30. **Bryne, Torleiv Håland (2017)**. Nonlinear Observer Design for Aided Inertial Navigation Systems of Ships
31. **Pedersen, Morten Dinhoff (2017)**. Stabilization of Floating Wind Turbines

32. **Klausen, Kristian (2017)**. Coordinated Control of Multirotors for Suspended Load Transportation and Fixed-Wing Net Recovery
33. **Fusini, Lorenzo (2017)**. Camera-Aided Inertial Navigation for UAVs using Nonlinear Observers.
34. **Borup, Kasper Trolle (2018)**. Air Data Estimation for Small Unmanned Aircraft
35. **Olafsson, Jonatan (2019)**. Multi-UAS Sea Ice Monitoring
36. **Gryte, Kristoffer (2020)**. Precision Control of Fixed-Wing UAV and Robust Navigation in GNSS-Denied Environments

RESEARCH AND PUBLICATIONS

I have published approximately 500 conference and journal papers, for a complete list see:

<http://www.fossen.biz/home/papers.html>

Indicator	Achievement
Google Scholar H-index (Hirsch number):	78*
International peer reviewed journal publications	~200
International conference papers	~300
Total number of citations	~30 000
Doctoral candidates (graduated and in progress)	37
Master students (graduated)	160

*Google Scholar H-index computed on 2020-10-20.

Citations to my articles

Google scholar publication statistics for professor Thor I. Fossen:

<http://scholar.google.com/citations?user=Sn8fzegAAAAJ&hl=en>

TEXTBOOKS

Fossen, T. I. (2021). *Handbook of Marine Craft Hydrodynamics and Motion Control*. 2nd ed. Wiley.

Fossen, T. I. (2011). *Handbook of Marine Craft Hydrodynamics and Motion Control*. 1st ed. Wiley.

Fossen, T. I. (2002). *Marine Control Systems*. Marine Cybernetics AS.

Fossen, T. I. (1994). *Guidance and Control of Ocean Vehicles*, Wiley.

EDITORIALS

Fossen, T. I., K. Y. Pettersen and H. Nijmeijer (2017) (eds.). *Sensing and Control for Autonomous Vehicles: Applications to Land, Water and Air Vehicles*, Springer.

Fossen, T. I. and H. Nijmeijer (2011) (eds). *Parametric Resonance in Dynamical Systems*, Springer.

Nijmeijer, H. and T. I. Fossen (1999) (eds). *New Directions in Nonlinear Observer Design*, Springer.

