



Daniel Hagen

Senior R&D Engineer, PhD

- 25 February 1988
- Birkenlund, Arendal
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- daniel.hagen@redrock.no

About me

Daniel is a curious, ambitious, and conscientious multidisciplinary engineer and a reserve officer with a passion for Mechatronics, innovation, R&D, and team leadership. After completing compulsory military service, he has gained relevant leader experience through his career and courses in the Norwegian Armed Forces. Daniel graduated with a Master's degree in 2014 based on his trade certificate. Before starting on a joint PhD education in 2016, he worked two years with offshore drilling equipment control systems throughout the world, both in test and commissioning phases and during operation.

Skills

- CAE – MATLAB/Simulink, SimulationX
- PLC – STEP 7, CODESYS (FBD, ST, LAD)
- HIL/SIL – NI Veristand, Simulink RT
- CAD – SOLIDWORKS, Autodesk Inventor
- HMI – Wonderware InTouch, TwinCAT
- OOP – C++, C#, Python
- Network – TCP, UDP, Profibus, EtherCAT
- Matlab Control System Toolbox*5, Simscape Multibody*5, Simulink PLC Coder*5, Simulink Design Optimization*4

(*)[The skill scale is from 0 (Fundamental Awareness) to 6 (Expert).]

Field of competence & research interests

- Dynamical modeling, simulation, and optimization of Mechatronics systems.
- Model-based design, implementation, and testing of control algorithms.
- Fluid power technology and control.
- Electric drives and control.
- Kinematics and dynamics of multibody systems.
- Motion compensation.
- Digital twins and real-time control systems.
- Automated design of actuation systems.

Work experience

- since 2021 Senior R&D Engineer Red Rock Marine
Responsible for control systems and involved in research and development projects within the Red Rock Group.
- 2020-2021 Researcher University of Agder
40% position doing research related to my PhD project.
- 2020-2021 R&D Engineer Red Rock Marine
40% position working with crane control systems.
- 2016-2020 PhD Candidate Cameron Sense & University of Agder
While employed in the Rig Equipment Engineering department at Cameron Sense AS as a System Engineer from May 2016 to July 2020, I worked with a joint PhD education related to the SFI Offshore Mechatronics project. The research aims to identify more environmentally friendly linear actuators and investigate the pros and cons associated with replacing conventional hydraulics.
- 2014-2016 Technical Support & Field Service Engineer – Control Systems Cameron Sense
Responsible for technical support, troubleshooting, development, upgrading, and testing of drilling equipment with a focus on control systems, electro, and instrumentation.
- 2010-2014 Summer Internships
2014 Bachmann Electronics GmbH | Master's Thesis Trainee.
2013 Cameron Sense | Technical Support – Control Systems.
2012 MHWirth | Hydraulic Design – RamRig group.
2004-2011 Hagen Mek. Verksted | .
- 2007-2009 Automation Mechanic Apprentice Aludyne Norway, Farsund
I obtained good experience within troubleshooting and maintenance of the machinery consisting of hydraulics, electro, instrumentation, PLCs, HMI, automated cells, and ABB industrial robots.

Education

- 2016-2020 Doctor of Philosophy (PhD) in Engineering Sciences with specialization in Mechatronics University of Agder
My dissertation *"Improving Energy Efficiency and Motion Control in Load-Carrying Applications using Self-Contained Cylinders"* was defended on September 2.
- 2012-2014 Masters of Science (MSc) in Mechatronics University of Agder & Fachhochschule Vorarlberg (Austria)
Double diploma program. My master's thesis *"Simulation-based Design of PLC-based MIMO Hybrid Controller for Hydraulic Presses"* was carried out at Bachmann Electronics GmbH in Feldkirch, Austria, during a six-month internship.
- 2009-2012 Bachelor of Science (BSc) in Mechatronics University of Agder
Occupation-path. The bachelor's project was on the development, construction, and inverse kinematic control of a 3D printed, RC servos controlled, robot arm for Vitensenteret Sørlandet.
- 2009-2020 Officer Training Courses Norwegian Armed Forces - Home Guard
Squad leader (2009), basic leadership (2010), youth leader (2010), platoon leader (2011), and company commander (2020).
- 2004-2009 Certificate of Apprenticeship Vest-Agder County Council
Automation Mechanic.



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Coder*5, Simulink Design
Optimization*4

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Leader experience

- since 2010 Leader & Board Member Norwegian Reserve Officers' Association (NROF) Member of the national executive board since 2018, leader of department Lister since 2017, and deputy board member in department Nedenes in the period 2010-2014.
- since 2009 Reserve Officer Agder & Rogaland Home Guard District (HV-08), Grimstad Platoon leader (lieutenant) of four infantry squads and the staff.
- 2009-2013 Youth Leader Agder & Rogaland Home Guard District (HV-08), Grimstad I started a new Home Guard youth department and instructed youths from 16 to 21 years in non-combatant military disciplines.

Publications

The following publications can be found at scholar.google.com:

- 2020 A method for smoothly disengaging the load-holding valves of energy-efficient electro-hydraulic systems.
- 2020 Guidelines to Choose Between Self-Contained Electro-Hydraulic and Electro-Mechanical Cylinders.
- 2019 A Comparison Study of a Novel Self-Contained Electro-Hydraulic Cylinder versus a Conventional Valve-Controlled Actuator – Part 2: Energy Efficiency.
- 2019 A Comparison Study of a Novel Self-Contained Electro-Hydraulic Cylinder versus a Conventional Valve-Controlled Actuator – Part 1: Motion Control.
- 2019 Enabling Energy Savings in Offshore Mechatronic Systems by using Self-Contained Cylinders.
- 2019 Design and Implementation of Pressure Feedback for Load-Carrying Applications with Position Control.
- 2019 A Self-Contained Electro-Hydraulic Cylinder with Passive Load-Holding Capability.
- 2018 Study of a Self-Contained Electro-Hydraulic Cylinder Drive.
- 2017 Feasibility Study of Electromechanical Cylinder Drivetrain for Off-shore Mechatronic Systems.

Awards

- 2020 *Plaque of Honor* – I received the Norwegian Reserve Officers' Association plaque of honor for my achievements as a leader for department Lister.
- 2011 *Commander's Coin* – I received the district commander's honors-coin after training and leading HV-08's team to victory in the Norwegian Championship for National Guard youths.
- 2008 *4th place in the Norwegian Championship in automation* – After being recommended and solving an assigned PLC programming task, I qualified for the final where 10 out of 180 students and apprentices competed to solve ten different problems in automation disciplines during the Norwegian occupational championship.

Societies

- 2019 *Norwegian Society of Mechatronics (NSOM)*
The NSOM was founded by Dr. Sondre S. Tørdal and Dr. Daniel Hagen in 2019. It is an organization for professional and social networking between scientists and engineers with a passion for Mechatronics and environmentally friendly technology.

Other information

Licenses & Certifications

- 2014 Basic Safety and Emergency Training – Basic Course | Falck Nutec.
- 2007 G4 – Bridge & Gantry Crane | Lister Opplæring.
- 2006 Driving License – BE-M-S-T | Statens Vegvesen.

Languages

Norwegian–native · English–proficient · German–rudimentary