

Ellen Nordgård-Hansen

Curriculum vitae and track record

PERSONAL INFORMATION

- Family name, First name: Nordgård-Hansen, Ellen Marie
- Date of birth: 15.12.1971
- Gender: Female
- Nationality: Norwegian

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KEY QUALIFICATIONS

25 years of experience from industrial development and research in the field of modelling, control, programming, and simulation. My publications include more than 20 publications, and 1 patent. I also have project manager experience from several projects with partners from both industry and research.

EDUCATION

- 1997* PhD: "Modelling Aluminium Electrolysis Cells using Nonequilibrium Thermodynamics". Disputation date: 19.6.1997.
Department of Physical and Macromolecular Chemistry, University of Leiden, the Netherlands
- 1995* Siv. ing. (Master): "Molten Salt Hydrates for Heat Storage Applications",
Institute of Physical Chemistry, NTH (NTNU), Norway. Grade reported to the King of Norway.

CURRENT AND PREVIOUS POSITIONS

- 2015 -* Senior Researcher
Modelling and Simulation group, Department of Technology, NORCE, Norway
- 2009 - 2014* Senior Thermal Designer
R&D Department, Barco, Norway
- 1996 - 2009* Project Engineer
Prediktor, Norway
- 1995 - 1996* Research Assistant
Institute of Physical Chemistry, NTH (NTNU), Norway

FELLOWSHIPS AND AWARDS

- 1995* ELF studiepris 1995 - Price for outstanding study achievements

MOBILITY

- 1996* Guest researcher at Imperial College London, London, England
- 1994* Diploma thesis at Technische Universität Bergakademie Freiberg, Freiberg, Germany

PROJECTS (SELECTED)

- 2022 - Project manager at NORCE and technical project member, "HULK -The Ultrastrong Green PE Fiber". Optimize process parameters for new HMPE production process.
- 2021 - 2022 Project manager at NORCE and technical project member, "Motor sailing with electric motor". Optimization of the combination of motor and sail for yachts, considering how using the motor will change the wind experienced by the sails.
- 2021 - 2022 Project manager at NORCE and technical project member, "BCS White paper". A report on how the use of carbon nanofibers in selected materials can contribute to improved properties, and thereby reduced CO₂ emissions.
- 2020 - Project contact at NORCE and technical project member, "Integrated Renewable Resources and Storage: Operation and Management". MILP optimization in python for optimizing configuration and management of ground source heat pumps in combination with photovoltaic cells for one-family homes in Norway.
- 2020 - 2021 Technical project member, "Real time monitoring of scaling in the roasting process reactors". Data-based modelling to see if measurements of scaling could be correlated with process data to devise a strategy to mitigate the fouling. Project partially funded by RFF Agder.
- 2020 - 2021 Project manager at NORCE and technical project member, "Energy optimization of commercial buildings using artificial intelligence". Python programming of model for changes in CO₂ concentration and temperature in buildings based on input from ventilation and heating system.
- 2019 - 2021 Technical project member, "Zero Emission Small Ships". MATLAB programming of fuel cell models and of a configurable energy management system. Simulation of cushion pressure control system for SES vessel.
- 2019 - Project contact at NORCE and technical project member, "Fibre Rope Mooring (FIRM)". Organizing testing of fiber rope and suggesting condition monitoring and maintenance regime for fiber ropes used for mooring of offshore wind turbines.
- 2019 Technical project member, "Simulering av hengende last fra kran». MATLAB programming of MPC controller.
- 2018 - 2020 Project contact at NORCE and technical project member, "Next generation of soft plastic hoses". Databased modelling of extrusion process, predicting plastic hose properties from process parameters.
- 2017 - 2020 Project manager and technical project member, "Design and Maintenance Based on Operational Data". Databased modelling of mechanical stress and resulting fatigue from crane angles and loads, programming in Python. Supervising summer intern.
- 2017 - Work package manager, "SFI for Offshore Mechatronics, WP5.3 – Monitoring Techniques – Fibre Ropes". Supervising PhD student and summer intern doing fiber rope testing and modelling, as well as own PCA modelling of rope aging from IR images.
- 2017 - 2018 Project contact at NORCE and technical project member, "Control System for SES vehicles". Programming in MATLAB to test and verify control system to minimize vertical acceleration in heavy waves.
- 2015 - 2016 Technical project member, "A combined global and local geomagnetic model for improving wellbore surveying accuracy". MATLAB programming and testing of model for the earth's magnetic field.
- 2015 - Project contact at NORCE and technical project member, "Simulation tool for Si refining", RaffSim, industrial project for Elkem. Mathematical modelling of transport processes and thermodynamics involved in silicon refining, programming in Python.
- 2015 - Project contact at NORCE and technical project member, various smaller projects, often IKT Forskerpool or Forskermobilisering.

- 2009 – 2014* Technical project member for designing and testing cooling systems for electronics, LEDs, and UHP lamps in projectors, internal projects at projectiondesign/Barco in Fredrikstad, Norway. CFD modelling, back-of-the-envelope calculations, as well as testing at high temperatures, low pressure, and high moisture. Configuring of control system for Peltier elements, heat sink design, UHP lamp testing, and acoustic measurements.
- 1996 – 2009* Technical project member in industrial projects, among others:
- Control of the water discharge in the Norwegian waterfalls Vøringsfossen and Østre Mardøla. Implementing a Dahlin controller in MATLAB, cooperation with Scanmatic, and taking part in the installation and commissioning on site.
 - Estimation of meat composition from NIR measurements. Using proprietary software to perform databased PLS modelling, taking part in installation and commissioning
 - Simulation of silicon refining, mathematical modelling of transport processes and thermodynamics involved in silicon refining, programming in C++.
 - Control of parts of a PVC factory in Stenungsund. Configuration of MPC controller, combined with a chemometrics quality model, as well as taking part in commissioning.
 - Implementation of various chemometrics methods, model-based predictive control (MPC) and Kalman filters. Programming in Delphi, C++, Java, and Visual Basic.
- 1996 – 2009* Project manager of industrial projects for introduction of material tracking at Kebony in Porsgrunn, Alcoa in Farsund (currently Aludyne), Elkem Solar in Kristiansand (currently REC Solar), and Scanwafer in Glomfjord.

SUPERVISION OF GRADUATE STUDENTS AND RESEARCH FELLOWS

- 2017 -* 1 PhD student, Shaun Falconer
Department of Engineering and Sciences, University of Agder, Norway

TEACHING ACTIVITIES

- 2017 - 2019* Part-time Teacher – Materials Science, Department of Engineering and Sciences, University of Agder, Norway

ORGANIZATION OF SCIENTIFIC MEETINGS

- 2017* One of two main organizers of the seminar “Steel and Fiber Ropes Seminar”, 50 participants from Norway and Europe, Grimstad, Norway
- 2021 - 2022* Part of organization committee for “WCSB10”, and international conference on sampling and blending May – June 2022, Kristiansand, Norway.

INSTITUTIONAL RESPONSIBILITIES

- 2015 - 2021* Union representative for Tekna in Teknova/NORCE. Review, discussion, and negotiations on agreements, salary, contracts, etc., as well as supporting individual members.
- 2007* Doctorate opponent for 1 PhD candidate, Audun Røsjorde
Institute of Physical Chemistry, NTH (NTNU), Norway.

PUBLICATIONS

Publications from the last 10 years:

- Alagic, E., Blomgren, A., Guo, Y., Nordgård-Hansen, E., Thisted, U.: "Reduction in CO₂ emissions from using carbon nanofiber additives" (2022), Report written for Bergen Carbon Solutions.
- Nordgård-Hansen, E., Kishor, N., Midttømme, K., Risinggård, V.K., Kocbach, J., "Case study on optimal design and operation of detached house energy system: Solar, battery, and ground source heat pump" (2022), *Applied Energy*, volume 308, doi: 10.1016/j.apenergy.2021.118370.
- Falconer, S., Nordgård-Hansen, E., Grasmo, G., "Remaining useful life estimation of HMPE rope during CBOS testing through machine learning" (2021), *Ocean Engineering*, Volume 238, doi: 10.1016/j.oceaneng.2021.109617.
- Kovács, A., Breward, C. Einarsrud, K., Halvorsen, S.A., Nordgård-Hansen, E., Manger, E., Münch, A., and Oliver, J. "A heat and mass transfer problem for the dissolution of an alumina particle in a cryolite bath" (2020), *International Journal of Heat and Mass Transfer*, vol. 162, p. 120232, doi: 10.1016/j.ijheatmasstransfer.2020.120232.
- Falconer, S., Nordgård-Hansen, E. and Grasmo, G., "Computer vision and thermal monitoring of HMPE fibre rope condition during CBOS testing" (2020), *Applied Ocean Research*, vol. 102, p. 102248, doi: 10.1016/j.apor.2020.102248.
- Nordgård-Hansen, E., Hassel, H.J., and Schlanbusch, R.: "Chemometrics as a Tool to Gain Insight into Fiber Rope Aging from Infrared Images" (2019), *Annual Conference of the PHM Society*, vol. 11, no. 1, Art. no. 1, doi: 10.36001/phmconf.2019.v11i1.598.
- Nordgård-Hansen, Ellen, Erdelyi, Szilvia, Vigier, Xavier, Buschmann, Markus: "Fatigue evaluation of offshore cranes based on operational data" (2019), "The 24th International Offshore Crane & Lifting Conference" – Stavanger, Norway.
- Falconer, Shaun, Grasmo, Geir, Nordgård-Hansen, Ellen: "Condition monitoring of HMPE fibre rope using computer vision during CBOS testing" (2019), OIPEEC Conference – The Hague, Netherlands.
- Falconer, S., Nordgård-Hansen, E., Grasmo, G.: "Temperature measurements as a method for monitoring ropes" (2018), *The 13th World Congress on Engineering Asset Management (WCEAM-2018)*, Stavanger, Norway.
- Nordgård-Hansen, E., Schlanbusch, R., Sørensen, T.: "Modeling of a lay-flat plastic hose extrusion process" (2017), *Modeling, Identification and Control*, 38(3), pp. 111-121.
- Roberts, L., Nordgård-Hansen, E., Mikkelsen, Ø., Halvorsen, S.A., Van Gorder, R.A.: "A heat and mass transfer study of carbon paste baking" (2017) *International Communications in Heat and Mass Transfer*, 88, pp. 9-19.
- Herland, E. V., Finlay, C. C., Olsen, N., Edvardsen, I, Nordgård-Hansen, E.M., Laundal, K. M., Waag, T.I.: "The CHAOS-X model and Uncertainty Values for Magnetic Directional Surveying" (2017) Paper presented at the SPE Bergen One Day Seminar, 5 April 2017, Bergen, Norway.
- Nordgård-Hansen, Ellen, Hildal, Kjetil: "Skull formation in dynamic modelling of silicon refining" (2016) paper presented at 17th IFAC Symposium on Control, Optimization and Automation in Mining, Mineral and Metal Processing, Vienna, Austria.

GRANTED PATENTS

Variable projector cooling apparatus and method. U.S Patent US8882276 B2 Co-author: Freddy Agnalt (projectiondesign AS)