

# Audun Oppedal Pedersen, ph. d.

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4 pages

## Personalia

- Date of birth: 03.06.1977
- Nationality: Norwegian

## Work experience

### ASSOCIATE PROFESSOR | UNIVERSITY OF BERGEN | 2021-PRESENT

- Acoustics
- Ocean Technology

### SENIOR R&D ENGINEER | CLAMPON AS | 2021-PRESENT

- Product and technology development
- Measurement physics, industrial instrumentation
- Intellectual property management

### DEVELOPMENT MANAGER | CLAMPON AS | 2012-2021

- Product and technology development
- Measurement physics, industrial instrumentation
- Design for manufacturing, sustaining, 2<sup>nd</sup> line support
- Product qualification, global market access
- Intellectual property management
- Department management

### ADJUNCT ASSOCIATE PROFESSOR II | UNIVERSITY OF BERGEN | 2009-2012

- Nonlinear acoustics
- Secondary position while working at CMR Instrumentation

### DEPARTMENT MANAGER | CHRISTIAN MICHELSEN RESEARCH AS | 2008-2012

- Scientist and Department Manager, CMR Instrumentation (now part of NORCE Norwegian Research Centre)
- Fisheries, Fish Farming, New Renewable Energy
- Measurement physics, industrial instrumentation, marine science, ultrasound acoustics

### RESEARCH & DEVELOPMENT ENGINEER | CLAMPON AS | 2006-2008

- Measurement physics, industrial instrumentation
- Passive ultrasonic sensing, Guided wave ultrasound monitoring

### RESEARCH FELLOW | CHRISTIAN MICHELSEN RESEARCH AS | 2003-2006

- PhD work on marine instrumentation; nonlinear ultrasound acoustics in the sea
- Experimental, theoretical, and numerical physics

## Education

### **UNIVERSITY PEDAGOGY | 2022 | FACULTY OF PSYCHOLOGY, UNIVERSITY OF BERGEN, NORWAY**

- Mandatory basic pedagogical competence for scientific staff at University of Bergen.

### **PH. D. | 2007 | DEPARTMENT OF PHYSICS AND TECHNOLOGY, UNIVERSITY OF BERGEN, NORWAY**

- Nonlinear Effects in Sonar and Echosounder Acoustics
- Supervisors: Per Lunde and Magne Vestrheim

### **PEDAGOGY | 2003 | FACULTY OF PSYCHOLOGY, UNIVERSITY OF BERGEN, NORWAY**

- Postgraduate Certificate in Education (PGCE)

### **CAND. SCIENT. | 2002 | DEPARTMENT OF PHYSICS AND TECHNOLOGY, UNIVERSITY OF BERGEN, NORWAY**

- Ultrasound Transducer Design and Experimental Study of Nonlinear Acoustic Propagation
- Supervisor: Halvor Hobæk

## Commissions

### **EDUCATIONAL PROGRAMME COMMITTEE | UNIVERSITY OF BERGEN | 2022-PRESENT**

- Physics Programme at Department of Physics and Technology

### **EDUCATIONAL PROGRAMME COMMITTEE | UNIVERSITY OF BERGEN | 2022-PRESENT**

- Ocean Technology Programme at Department of Physics and Technology

### **EDUCATIONAL PROGRAMME BOARD | WESTERN NORWAY UNIVERSITY OF APPLIED SCIENCES | 2018-2021**

- Advisory board for the Department of Computer Science, Electrical Engineering, and Mathematical Sciences

### **BOARD MEMBER | FANATUNET BARNEHAGE SA | 2014-2018**

- Privately run daycare provider

### **STEERING COMMITTEE | NCE SUBSEA ACOUSTICS GROUP | 2009-2015**

- Committee for acoustics in instrumentation under the NCE Subsea industry cluster (Norwegian Centre of Expertise; now GCE Ocean Technology)
- Chair of the Committee May 2012–June 2015

## Granted projects

### **SIMPLIFIED TOMOGRAPHIC IMAGING | NFR – SKATTEFUNN PROJECT | 2020–2021**

- Project Manager and author of the application, for ClampOn AS
- Project size: 12 MNOK

### **WIRELESS INSTRUMENTATION WITH NEW ELECTRONICS PLATFORM | NFR – SKATTEFUNN PROJECT | 2019–2022**

- Project Manager and author of the application, for ClampOn AS
- Project size: 17 MNOK

### **SUBSEA CORROSION-EROSION MONITOR WITH SIIS LEVEL 2 INTERFACE | NFR – SKATTEFUNN PROJECT | 2018–2020**

- Project Manager and author of the application, for ClampOn AS
- Project size: 5 MNOK

### **MICROWAVE DETECTION OF CORROSION UNDER INSULATION | INNOVATION NORWAY – INNOVATION PROJECT | 2017–2019**

- Project Manager and main author of the application, for ClampOn AS
- Partners: ClampOn AS, University of Cincinnati (USA), Your Solutions Engineering Co., Ltd. (Taiwan)
- Project size: 7 MNOK

## **TOMOGRAPHY FOR CORROSION-EROSION MONITORING | INNOVATION NORWAY – INNOVATION PROJECT | 2016–2017**

- Project Manager and main author of the application, for ClampOn AS
- Partners: ClampOn AS, Cincinnati NDE Ltd. (USA), Shell Global Solutions (USA and The Netherlands)
- Project size: 9 MNOK

## **EXACTUS | NFR – KMB PROJECT IN THE HAVBRUK PROGRAMME | 2010–2012**

- Work Package Manager and co-author of the application, for CMR Instrumentation
- Improvement of biomass control in fish farming. Our work package was on biomass measurement.
- Research partners: SINTEF, Christian Michelsen Research AS, Institute of Marine Research, Norwegian School of Veterinary Science, NTNU, University of Oslo.  
Industry partners: The Directorate of Fisheries, Salmar Farming AS, Marine Harvest Norway AS, Lerøy Seafood Group ASA, VAKI Aquaculture Systems Ltd, EWOS Innovation AS, BioMar AS, Nexans Norway AS, Norbit Subsea AS, Ocea Gruppen AS

## **FISH FLOW METER | NFR – VERIFICATION PROJECT IN THE FORNY PROGRAMME | 2009–2010**

- Project Manager and co-author of the application, for CMR Instrumentation
- Commercialization of electromagnetic flowmeter for pelagic fisheries
- Project owner: Christian Michelsen Research AS

## **MINIERROR – MINIMIZING EFFECTS OF NONLINEAR SOUND PROPAGATION IN FISHERIES AND RESEARCH ECHO SOUNDERS AND SONARS | NFR – HAVBRUK PROGRAMME | 2003–2006**

- Participant, ph. d. student, for CMR Instrumentation
- Partners: Christian Michelsen Research AS, University of Bergen, Institute of Marine Research, Kongsberg Maritime AS

## **Publications**

A. O. Pedersen, G. Instanes, P. B. Nagy, and F. Simonetti, "Light-weight tomographic monitoring of pipe wall thickness," in Proceedings of the Offshore Technology Conference, Houston, Texas, USA, May 2023. Paper number OTC-32165-MS.

A. O. Pedersen, P. B. Nagy, F. Simonetti, and G. Instanes, "Light-weight tomographic wall thickness mapping of pipes," presented at 46<sup>th</sup> Scandinavian Symposium on Physical Acoustics, Geilo, Norway, 29 January–2 February 2023.

A. O. Pedersen, P. B. Nagy, F. Simonetti, and G. Instanes, "Tomographic monitoring of wall thickness," presented at Underwater Technology Conference, Bergen, Norway, 13–15 June 2022.

A. O. Pedersen, P. Lunde, R. J. Korneliussen, and F. E. Tichy, "Finite-amplitude sound propagation effects in fish abundance estimation," in proc. 45<sup>th</sup> Scandinavian Symposium on Physical Acoustics, online, 31 January–1 February 2022.

A. O. Pedersen, P. Lunde, F. E. Tichy, and R. J. Korneliussen, "Finite-amplitude sound propagation effects in volume backscattering measurements for fish abundance estimation," Acta Acustica, 6(14) 2022.

A. O. Pedersen, P. Lunde, R. J. Korneliussen, and F. E. Tichy, "Finite-amplitude sound propagation effects in fish abundance estimation," presented at 45<sup>th</sup> Scandinavian Symposium on Physical Acoustics, online, 31 January–1 February 2022.

A. O. Pedersen and G. Instanes, "Method and apparatus for calculation of wall thickness variations," US Patent 11,466,983. UK patent application 2005130.6, Norwegian patent application 20200425, 2020.

G. Instanes, A. O. Pedersen, and F. Simonetti, "Using Long-Range Microwaves to Detect Wet Insulation & Corrosion Residue to Mitigate CUI", Presented at the 17<sup>th</sup> Middle East Corrosion Conference & Exhibition, Bahrain, 30 September–3 October 2018.

G. Instanes, A. O. Pedersen, and F. Simonetti, "Ultrasonic Computerized Tomography for Continuous Monitoring of Corrosion and Erosion Damage in Pipes", Presented at the 17<sup>th</sup> Middle East Corrosion Conference & Exhibition, Bahrain, 30 September–3 October 2018.

F. Simonetti, G. Instanes, and A. O. Pedersen, "First field results of guided wave tomography for continuous monitoring of corrosion and erosion damage in pipelines", In Proceedings of the 11<sup>th</sup> International Workshop on Structural Health Monitoring, September 12-14, Stanford CA, 2017.

A. O. Pedersen. Combating corrosion. Oilfield Technology, January 2017. Available online: <https://www.clampon.com/wp-content/uploads/2017/05/Combating-Corrosion-Oilfield-Technology-January-2017.pdf>

G. Instanes, F. Simonetti, P. B. Nagy, and A. O. Pedersen, "Corrosion-Erosion Monitoring Systems for Managing Asset Integrity", presented at 16<sup>th</sup> Middle East Corrosion Conference and Exhibition, Bahrain, 2016.

- F. Simonetti, P. B. Nagy, G. Instanes, and A. O. Pedersen, "Ultrasonic Computerized Tomography for Continuous Monitoring of Corrosion and Erosion Damage in Pipelines", presented at EuroCORR 2016, Montpellier, 11–15 September 2016.
- F. Simonetti, P. B. Nagy, A. Brath, C. L. Willey, G. Instanes, and A. O. Pedersen, "Ultrasonic Computerized Tomography for Continuous Monitoring of Corrosion and Erosion Damage in Pipelines", presented at NACE CORROSION 2015 Conference and EXPO, Houston TX, 2015.
- P. Lunde and A. O. Pedersen, "Volume backscattering of finite-amplitude acoustic waves: Power flow, sampled volume, and scattering cross section", presented at 38<sup>th</sup> Scandinavian Symposium on Physical Acoustics, Geilo, Norway, February 2015. Available online: <http://www.norskfysikk.no/nfs/faggrupper/akustikk2015/program.html>
- G. Instanes, F. Simonetti, and A. O. Pedersen, "Can a Corrosion Monitoring System with Tomography Provide Minimum Wall Thickness Readings?", presented at Deep Offshore Technology (DOT), Houston, TX, USA, 22–24 October, 2013.
- P. Lunde, A. O. Pedersen, R. Korneliussen, F. E. Tichy, and H. Nes "Power-budget and echo-integrator equations for fish abundance estimation", *Fisken og havet* no. 10/2013, Institute of Marine Research, Bergen, Norway, 39 p. Available online: [https://www.hi.no/hi/nettrapporter/fisken-og-havet/2013/fh\\_10-2013\\_echo\\_integrator](https://www.hi.no/hi/nettrapporter/fisken-og-havet/2013/fh_10-2013_echo_integrator)
- P. Lunde and A. O. Pedersen, "Sonar and power budget equations for backscattering of finite amplitude sound waves, with implications in fishery acoustics for abundance estimation of marine resources", presented at 35<sup>th</sup> Scandinavian Symposium on Physical Acoustics, Geilo, Norway, 29 January–1 February, 2012. Available online: [https://www.ntnu.edu/documents/14687435/14716676/SSPA\\_2012\\_Lunde\\_Pedersen\\_Finite\\_ampl\\_fishery\\_11p.pdf](https://www.ntnu.edu/documents/14687435/14716676/SSPA_2012_Lunde_Pedersen_Finite_ampl_fishery_11p.pdf)
- M. Breen, B. Isaksen, E. Ona, A. O. Pedersen, G. Pedersen, J. Saltskår, B. Svoldal, M. Tenningen, P. J. Thomas, B. Totland, and A. Vold, "A review of possible mitigation measures for reducing mortality caused by slipping from purse-seine fisheries", *The International Council for the Exploration of the Seas (ICES) CM 100/2012*.
- R. J. Korneliussen and A. Pedersen, "Correction of historical multi-frequency data for nonlinear loss", presented at the ICES Working Group on Fisheries Acoustic Science and Technology (WGFAST), Reykjavik, Iceland, 2011.
- O. Brix, G. Pedersen, A. O. Pedersen, J. Spilde, G. Lied, and E. O. Dahl, "Petroleum technology supports fisheries management", *Biophysics & Bioengineering Letters* 4(1), 2011. Available online: <https://ojs.uniroma1.it/index.php/CISB-BBL/article/view/9156/0>
- G. Instanes, A. Pedersen, M. Toppe, and P. B. Nagy, "Constant group velocity ultrasound guided wave inspection for corrosion and erosion monitoring in pipes". *AIP Conf. Proc.*, 1096, pp. 1386–1393, 2009. Available online: <https://doi.org/10.1063/1.3114119>
- J. Dalen, J. M. Hovem, H. E. Karlsen, P. H. Kvadsheim, S. Løkkeborg, R. Mjelde, A. Pedersen, and A. B. Skiftesvik, "Kunnskapsstatus og forskningsbehov med hensyn til skremmeeffekter og skadevirkninger av seismiske lydbølger på fisk og sjøpattedyr" (Knowledge status and research needs regarding adverse effects of seismic sound waves on fish and marine mammals). Report to the Directorate of Fisheries, Norwegian Petroleum Directorate, and Norwegian Pollution Control Authority. Bergen, 2008. ISBN 82-7257-661-9.
- G. Instanes and A. O. Pedersen, "Leaking subsea valves; identification, quantification, and monitoring by using ultrasonic systems", presented at SPE Asia Pacific Oil and Gas Conference and Exhibition, Perth, Australia, 20–22 October 2008.
- A. Pedersen, "Effects of nonlinear sound propagation in fisheries research". Doctoral thesis, University of Bergen, Norway, 2007. ISBN 978-82-308-0345-5. Available in BORA: <http://hdl.handle.net/1956/2158>
- A. Pedersen, M. Vestrheim, and P. Lunde, "Quantification of nonlinear sound propagation effects in fisheries research echo sounders". In *Proc. Underwater Acoustic Measurements: Technologies & Results*, Heraklion, Greece, 28 June–1 July, 2005.
- A. Pedersen, M. Vestrheim, and P. Lunde, "Nonlinear sound propagation effects in fisheries research echo sounders – Measurements and simulations in fresh water". In *Proc. 28<sup>th</sup> Scandinavian Symposium on Physical Acoustics*, Ustaoset, Norway, 23–26 January, 2005.
- A. Pedersen, "Design og studier av lydkilde for SOBER-prosjektet". Cand. scient. thesis, University of Bergen, Norway, 2002. Available in BORA: <http://hdl.handle.net/1956/1698>