

Dennis Madsen

Medical Computer Vision



Contact

Theilerstrasse 7
6300 Zug
Switzerland
+41 78 881 89 05

madsen_dennis@icloud.com
Linkedin:dennis-madsen
<http://dennismadsen.me/>
Youtube Channel

Languages

Danish - Native
English - Proficient
German - B1/B2

Skills

♥ Scala, ♥ Python
C, C++, SQL, VHDL
Matlab, Java
LaTeX
CSS, JavaScript & HTML
Web frameworks:
Django, Web2py, Flask

Experience

- 2021–Now **University of Basel** Basel, Switzerland
Postdoctoral Researcher - Lecturing the course *Pattern recognition* and main responsible for the exercises. Working on automatic diagnostic system for the dentist industry.
- 2017–2021 **University of Basel** Basel, Switzerland
Research Assistant / PhD Candidate - Lecturing the course *Pattern recognition* and main responsible for the exercises.
- 2016–2019 **Capana** Remote from Switzerland
Consultant - Development projects and tool testing for Siemens Wind Power.
- 2014–2015 **Siemens Wind Power** Brande, Denmark
Embedded Software Support Engineer - Work task automation of manual procedures; software updates and support of Siemens Wind Turbine Controllers.
- 2009–2014 **Microdevelopment** Herning, Denmark
Owner - Developing an electronic speed tables for use in historical reliability races. Responsible for software development, web design and customer contact.
- 2013–2013 **Litepoint** Sunnyvale, California, USA
Electronic Engineer Intern - Test system interface using a local web server.
- 2006–2014 **KK-Electronic** Ikast, Denmark
Embedded Software Engineer Student / Electronic Industrial Technician Trainee HW design, embedded SW (c), documentation, prototyping (mechanic, PCB, test scripting), HW coding (VHDL).

Education

- 2017–2021 **PhD Computer Science** Basel University, Switzerland
Thesis: A Probabilistic Surface Registration Framework with Applications to Partial Data Analysis - Model-based medical image analysis with focus area on registration and modelling using partial data as well as uncertainty in surface reconstruction.
The highest grade was achieved for my thesis (Summa cum laude).
- 2015–2017 **MSc Computer Science** Basel University, Switzerland
Thesis: Craniofacial modelling by combining statistical models of the face and the skull - Combining independent statistical shape models.
The highest grade was achieved for my thesis (6.0).
- 2010–2014 **BSc Electronic Design Engineering** Aarhus University, Denmark
Thesis: Power quality analysis of wind turbines - Harmonic frequency analysis prototype implementation in a Texas Instrument DSP.
The highest grade was achieved for my thesis (12).
- 2009–2010 **Pre-admission course** Aarhus University, Denmark
- 2005–2009 **Electronic Industrial Technician** (elektronikfagtekniker) Mercantec Viborg, Denmark

Courses

2021	Project Management – A Toolbox for Scientists	University of Basel
2021	Innosuisse Start-up Training: Business Concept (Module 2)	University of Basel

Awards

2018	Best Presentation Award Recognition of the best poster presentation given at the Medical Imaging Summer School (MISS) http://iplab.dmi.unict.it/miss/posters.htm	Favignana, Sicily, Italy
2018	2nd Best Presentation Award Recognition of the second best presentation given at the EXCITE Summer School on Biomedical Imaging http://www.excite.ethz.ch/education/summer-school.html	ETH Zürich, Switzerland

Hackathons

2017	Price Winner Project: Social-Eyes - Enabling visually impaired persons to easily share images on social media. https://www.youtube.com/watch?v=114iiC9J9to	CopenHacks, Copenhagen Hackathon
2016	Winner of - main sponsor (Logitech) challenge Project: GamEmotion - analysis of gamers emotions while playing, and a website to evaluate the data stream. https://www.youtube.com/watch?v=3C0_xql0jyo	LausHack, Lausanne Hackathon
2016,17,18	HackZürich Participant	Europe's largest hackathon

Publications

Books

A Probabilistic Surface Registration Framework with Applications to Partial Data Analysis
Dennis Madsen (Doctoral Thesis)
University of Basel, 2021

International peer-reviewed conferences/proceedings

Sequential gaussian process regression for simultaneous pathology detection and shape reconstruction

Dana Rahbani, Andreas Morel-Forster, Dennis Madsen, Jonathan Aellen, Thomas Vetter
International Conference on Medical Image Computing and Computer-Assisted Intervention, 2021

A closest point proposal for MCMC-based probabilistic surface registration

Dennis Madsen, Andreas Morel-Forster, Patrick Kahr, Dana Rahbani, Thomas Vetter, Marcel Lüthi
European Conference on Computer Vision (ECCV), 2020

Learning Shape Priors from Pieces

Dennis Madsen, Jonathan Aellen, Andreas Morel-Forster, Thomas Vetter, Marcel Lüthi
International Workshop on Shape in Medical Imaging (ShapeMi), 2020

Probabilistic joint face-skull modelling for facial reconstruction

Dennis Madsen, Marcel Lüthi, Andreas Schneider, Thomas Vetter

Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018

International peer-reviewed workshops/proceedings

Dennis Madsen, Thomas Vetter, Marcel Lüthi. “Probabilistic surface reconstruction with unknown correspondence”. In: *Uncertainty for Safe Utilization of Machine Learning in Medical Imaging and Clinical Image-Based Procedures (UNSURE)*. Springer, Cham, 2019, pp. 3–11.

Dana Rahbani, Andreas Morel-Forster, Dennis Madsen, Marcel Lüthi, Thomas Vetter. “Robust registration of statistical shape models for unsupervised pathology annotation”. In: *Large-Scale Annotation of Biomedical Data and Expert Label Synthesis and Hardware Aware Learning for Medical Imaging and Computer Assisted Intervention (LABELS)*. Springer, Cham, 2019, pp. 13–21.

Other

GiNGR: Generalized Iterative Non-Rigid Point Cloud and Surface Registration Using Gaussian Process Regression

Dennis Madsen, Jonathan Aellen, Andreas Morel-Forster, Thomas Vetter, Marcel Lüthi

arXiv preprint arXiv:2203.09986 (2022). 2022

Software

- GiNGR (Non-rigid registration framework), *Main developer (based on PhD. Thesis)*
- Scalismo (Library for statistical shape modeling), *Contributor*
- Scalismo-UI (Visualization of statistical shape modeling), *Contributor*