Morten **Engelsen**

Research Software Engineer

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github.com/mofii
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US & Danish citizenship

Bio

My passion lies in combining and applying multiple disciplines in order to tackle complex and diverse technical challenges. Over the last 15 years, I have used a mix of research and software engineering application to foster innovation for ultrasound imaging and medical image processing.

Most recently, I took time to create my own path by founding mofii io in order to scratch the creative itch I've had for years to develop and mature lingering ideas into possible products.

Before mofii io, I served as the Head of Software & Algorithms at the start-up Orchard Ultrasound Innovations. My role was to define and develop the critical path to the company's software and algorithms foundation and to lead novel applied physics data-processing research building on my role as a Research Scientist at Stanford University.

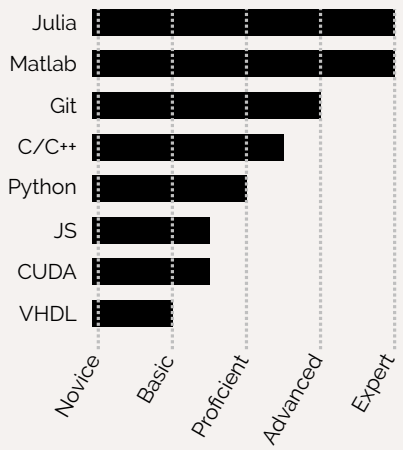
I like to think of myself as collaborative and adaptable. My energy comes from being able to solve what is most needed - whether it is to focus on specific technical challenge, to build a bridge for an effective communication between software and hardware engineers, or to be a champion to ensure that business operations have the context they need to build an enduring business.

Skills

ENGINEERING Signal & Image Processing, Beamforming, Acoustics, Physics simulations & modeling, Optimization, Machine Learning.

LANGUAGES English, Danish, German.

SOFTWARE BY PROFICIENCY



Experience

2023 – 2024 (part time)
Founder, CEO — **mofii io, llc**
Innovating, testing and product developing a range of concepts.
`Rust / Julia / Laser Cutting / 3D Printing`

2019 – 2023
Head of Software & Algorithms, Principal Engineer — **Orchard Ultrasound Innovation, LLC**
Inaugural engineer and a founding team member. My focus was to partner with the rest of the founding team to establish the company's technical foundation and strategic direction. Key achievements include:

Software Development Leadership Led all stages of software development, including planning, designing, building, testing, deploying, and DevOps implementation.

Nonlinear Signal Processing Spearheaded a groundbreaking project utilizing advanced applied physics to develop an industry-first feature in medical ultrasound.

Strategic Project Management Directed timelines, resource allocation, and execution for software projects, ensuring delivery aligned with organizational goals and technical requirements.

Innovative Software Solutions Created internal GUIs (full-stack) for proof-of-concept testing, in-house hardware evaluation, and investor demonstrations. Designed and implemented remote control and automatic testing software for lab equipment.

`Julia / DevOps / Python / JS / React`

2015 – 2019
Research Scientist — **Stanford University**
Worked on many different ultrasound related projects, from acoustic neurostimulation, retinal ultrasound stimulation (to make blind people regain vision), full gastrointestinal ultrasound scanning from a pill-cam, combined 3D HIFU and imaging, to photo-acoustics. Designed and implemented a real-time, parallel-processing solution for medical ultrasound imaging at the School of Medicine, leveraging a combined approach of MATLAB, C, and CUDA. Developed a real-time processing system for ultrasound fingerprint scanning using Python, MATLAB, and Julia. Authored 7 patents some of which made the foundation on which Orchard Ultrasound Innovation was later founded. Co-supervised Stanford PhD candidates. Applied for research grants to ensure the continuation of the research in the group.
`Matlab / C / CUDA / Python / Julia`

2010 – 2011 (part time)
CTO — **Biledbutikken Aps**
I led all technical teams, overseeing the design team, coordinating with programming teams based in China, managing web and NAS servers, setting up network infrastructure, and driving cybersecurity initiatives.
`PHP / JS / DevOps / Cyber Security`

2002 – 2004
Sergeant — **Danish Army**
I led and motivated a diverse team of soldiers with varying backgrounds and levels. I developed strong presentation skills and conducted lectures for groups of up to 100 soldiers.
`Leadership / Applied Motivational Skills`

Education

2011 – 2014
PhD — **Technical University of Denmark**
Thesis: 3D Synthetic Aperture Imaging and Row-column Addressing of 2D Transducer Arays
I specialized in advanced ultrasound imaging, including beamforming, image processing, and applied mathematics. I developed a novel ultrasound processing algorithm and invented a unique transducer design that significantly improved data measurement quality. This innovation led to a groundbreaking patent, recognized as the university's most financially successful patent of 2014.

2008 – 2011
M.Sc. in EE with Space Technology Specialization — **Technical University of Denmark**
Thesis: 3D Ultrasound Imaging
Specialized in medical ultrasound imaging and both linear and non-linear signal and image processing.
My master's thesis centered on reverse engineering a medical ultrasound matrix probe and developing a high-quality 3D ultrasound imaging algorithm. This project used advanced computational techniques to enhance image quality in ultrasound imaging.

2004 – 2008
B.Sc in EE — **Technical University of Denmark & TU Berlin**
Thesis: Control Software for the BeeSat Power Control and Distribution Unit.
I had a comprehensive focus on both theoretical and practical applications. Coursework included in-depth studies in subjects such as computer vision (OpenCV), parallel computing (OpenCL, CUDA), control theory, analog and digital electronics, probability and statistics, VHDL for FPGA programming, PCB design and fabrication, microcontroller programming, and foundational topics in mathematics and physics.
For my bachelor thesis, I developed and implemented the software for the power control and distribution unit of the CubeSat "BeeSat," successfully launched into orbit with my code operational on board. This code was later adopted by TU Berlin for instructional use in satellite programming.