

# Emil Johansson

SOFTWARE ENGINEER · EMBEDDED SYSTEMS · BACKEND

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## Summary

I have an M.Sc in Mathematical Physics, and my interests include, but are not limited to, Linux and open source software, cryptocurrencies, quantum mechanics, and machine learning,. I have a year of experience in creating novel deep learning applications in physics during which I received the "NanoLund Junior Scientist Ideas Award". At ÅF I have been working with the IT security company Advenica, creating network segmentation solutions for critical infrastructure. My current assignment is at a large international undisclosed company developing in the backend using Scala, TypeScript, and Python.

In my spare time, I like to go hiking, read interesting articles and tutorials, work on private programming projects, and tinker with computers. An example is a Raspberry Pi that is running a network-wide ad-blocker, Plex media center, personal git repositories, and personal file storage. Many of my skills originate from learning in my spare time.

## Skills

**Programming** Python, Linux, Scala, Continuous Integration, TypeScript, C/C++, LaTeX, git

**Machine Learning** TensorFlow, Keras, Google Cloud

**Languages** Swedish, English

## Experience

### Backend applications

*Malmö, Sweden*

UNDISCLOSED

*Feb. 2018 - present*

- Working in the backend using Scala, TypeScript, and Python.
- Learning a lot about continuous integration, the challenges of handling complexity in software, and working with aligning the work to create maximal value for the customer in large organisations.

### IT security solutions for critical infrastructure

*Malmö, Sweden*

ADVENICA

*Sep. 2018 - Dec. 2018*

- Levering GNU/Linux and C/C++ knowledge as a consultant, developing support for a new protocol to their network segmentation products for critical infrastructure.
- Learned a lot about the challenges of adopting agile development practices and continuous integration in a security focused IT environment.

### Applying Machine Learning to mathematical physics

*Lund, Sweden*

LUND UNIVERSITY, SOLID STATE PHYSICS, THEORETICAL PHYSICS, AND MATHEMATICAL PHYSICS

*Sep. 2017 - Aug. 2018*

- Explored novel ways to reformulate constrained optimization into machine learning, the results was interesting enough to warrant the "NanoLund Junior Scientist Ideas Award"
- Used to Google Cloud to fast scale up and down as demand for computational power (both CPU and GPU) changed during the project.

### Full Stack Web Application

*Lund, Sweden*

PRIVATE PROJECT

*Mar. 2017*

- Created a proof-of-concept "Wikipedia band name generator" web site leveraging public APIs, python code, cloud hosting, and flask to automatically generate silly band names and cover art.

## IOS and Desktop QT Application

Lund, Sweden

PRIVATE PROJECT

Sep. 2016

- My interest in automation resulted in that creating a Sudoku solver app seems more fun than solving Sudoku manually so that is what I did.
- Learned about connecting and separating back end a front end logic as well as the QT framework

## Numerical Simulations of Nunneries

Lund, Sweden

LUND UNIVERSITY, MATHEMATICAL PHYSICS

Sep. 2016

- I wrote a code based on a quantum transport simulation library named Kwant, simulating the effects of different contact geometries on conductivity in nanowires.
- First interaction with one of my now favorite design patterns. Writing performance critical function calls in c/c++ and exposing them as python functions for the high level logic.

## Education

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### Lund University

Lund, Sweden

M.SC IN PHYSICS

Sep. 2016 - Jun. 2018

Focus on theoretical physics and computational physics using machine learning.

### Lund University

Lund, Sweden

B.Sc IN PHYSICS

Sep. 2013 - Jun. 2016

Focus on computational and mathematical physics.

## Employment

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### ÅF – Embedded Systems

Malmö, Sweden

SOFTWARE DEVELOPER

Sep. 2018 – Present

### Lund University, Faculty of Engineering

Lund, Sweden

PROJECT ASSISTANT

Jun. 2018 – Aug. 2018

### Lund University, Faculty of Engineering

Lund, Sweden

EXERCISE TUTOR

Sep. 2017 – Nov. 2017

## Honors & Awards

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2018 **NanoLund Junior Scientist Ideas Award**, For M.Sc project exploring novel applications of machine learning.

NanoLund

Stockholm

2013 **Swedish Junior Water Prize.**, Award for high school degree project.

International Water  
Institute.

## Writing

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### Teaching a Neural Network Quantum Mechanics. A Deep Learning Approach to the N-Representability Problem.

M.Sc thesis.

AUTHOR

2018

<https://lup.lub.lu.se/student-papers/search/publication/8951887>

### Numerical simulations of contact geometry effects on transport properties of semiconductor nanowires

B.Sc thesis.

AUTHOR

2016

<https://lup.lub.lu.se/student-papers/search/publication/8878322>