Vegard Børve Sørdal

vegard.soerdal@gmail.com | vegardbs.github.io

EDUCATION

UNIVERSITY OF OSLO
Ph.D. in Theoretical Physics
2015-2019 | Oslo, Norway
My main focus has been studying how the possession of information and feedback control affects the efficiency of thermodynamic machines, and how to optimize their operation.
GPA: N/A

M.Sc. in Theoretical Physics
2013-2015 | Oslo, Norway
Specialized in statistical physics.
1 semester at Sorbonne University.
GPA: 3.83 / 4.0

UNIVERSITY OF BERGEN
B.Sc. in Physics
2008-2011 | Bergen, Norway
2 semesters at The University of Hawaii.
GPA: 3.77 / 4.0

LINKS

Webpage:// **vegardbs**
Github:// **vegardbs**
LinkedIn:// **vegardbs**

SKILLS

PROGRAMMING
Python • Matlab• C++ • LaTeX
NumPy • Pandas • Scikit-learn • Keras
Tensorflow • Jupyter Notebook

MATHEMATICS
Optimization • Differential equations
Linear algebra • Calculus • Statistics

PHYSICS
Information theory • Statistical physics
Biophysics • Computational physics
Quantum physics

MACHINE LEARNING
Data cleaning • Data analysis
Machine learning basics (classification, prediction, etc) • Deep learning
Reinforcement learning

GENERAL
Experienced teacher • Public speaking
Project management • Time management
Modeling • Team focused collaborations
Languages
Native Norwegian • Fluent English
Conversational Japanese • Basic French

I have a very broad set of interests, but a recurring theme is systems where complex behaviour arise from simple underlying rules; everything from molecular machines to foreign exchange markets and neural networks. In my early career I focused on nano-physics, performing both experiments and the associated data analysis. Later I moved into theoretical physics, mainly optimizing information processes in physics.

EXPERIENCE

GUEST RESEARCHER | University of Barcelona
June 2016 – Feb 2017 | Barcelona, Spain
- Researched the fluctuations of molecular machines responsible for unzipping DNA helix.
- Helped develop the theoretical background. Cleaned, visualized and analyzed large amounts of noisy data.

SUMMER INTERN | NanoTecCenter Weiz
July 2013 – Aug 2013 | Graz, Austria
- Worked with a team developing organic memory devices coupled to organic LED. I was responsible for the fabrication and characterization of the devices.

RESEARCH ASSISTANT
Jan 2013 – May 2013 | University of Hawaii
Studied properties of graphene. I took initiative to self-learn how to operate atomic force and scanninc tunneling microscopes, since their operational knowledge had been lost from the lab.

March 2012 – Oct 2012 | University of Tokyo
Researched quantum spin-filtering. Operated a dilution refrigerator needed to keep the experimental samples close to absolute zero temperature, and performed associated data analysis.

TEACHING ASSISTANT

Every spring 2015-2019	University of Oslo	Statistical Physics
Every fall 2017-2019	University of Oslo	EM & Thermodynamics
Spring 2013	University of Hawaii	Electromagnetism
Fall 2011	University of Bergen	Introductory physics

- I have ∼ 5 full years of teaching experience from various institutions, for both undergraduate and graduate classes.
- Responsibilities include creating weekly problem sets, midterms and exams, as well as guiding the students through the solutions and making difficult concepts easy to understand.

PUBLICATIONS

Deep reinforcement learning for quantum Szilard engine optimization
VB Sørdal, J Bergli   Physical Review A 100, 042314- 2019

Quantum particle in a split box: Excitations to the ground state
VB Sørdal, J Bergli   Physical Review A 9 (2), 022121 - 2019

Influence of measurement error on Maxwell's demon
VB Sørdal, J Bergli, YM Galperin   Physical Review E 95 (6), 062129 - 2017

Cooling by heating: Restoration of the third law of thermodynamics
VB Sørdal, J Bergli, YM Galperin   Physical Review E 93 (3), 032102 - 2016

Monolithically integrated organic resistive switches for luminance and emission color manipulation in polymer light emitting diodes
S Nau, VB Sørdal, C Wolf, S Sax, EJW List Applied Physics Letters 107 (13) 94 - 2015