Kilian Walsh

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Astrophysicist-turned-ML-scientist-engineer, statistical modeling and inference, deep learning and computer vision, building data pipelines, writing julia, python, C/C++ in Linux, numerical simulation, data engineering. Open source contributor, passionate about the latest technology, developments in software tools and data science methods. Experienced educator and team worker, communicating complex topics at technical and lay levels. Speaks English and German fluently, some French and basic Mandarin. Enjoys sports (esp. swimming, cycling), woodwork (incl. musical instruments - have built a celtic harp), bicycle/motorcycle maintenance, gardening, brewing and baking, reading, volunteering and civic engagement.

Work

Whiteboard Coordinator
Mar 2019 - Present

Machine Learning Scientist-Engineer

- wearing many hats in an early stage (team of <10) medical technology startup
- built entire research and deployment infrastructure for computer vision in hospitals from the ground up
- experience with fast-paced, high intensity environments, demoing and deploying for clients and investors

Education

New York University
Sep 2011 - Jan 2019

Ph.D. – Physics – thesis: "An Exploration of New Links in the Galaxy-Halo Connection"

- Research Topics: astrophysics, cosmology, galaxy evolution, dark matter
- Funded by NYU scholarships, NSF, and research/teaching assistantships

Trinity College Dublin
Sep 2007 - Jun 2011

B.A. – Natural Science (Physics & Astrophysics major) with First Class Honours

- Final year dissertation project completed at University of Aarhus in Denmark
- Completed voluntary advanced exams to win competitive Foundation Scholarship, granting free tuition, housing, meals, and stipend

Research & Projects

Whiteboard Coordinator
March 2019 - Present

Computer Vision research and ML infrastructure engineering

- developing and implementing computer vision algorithms to deploy in medical facilities for their improved operating efficiency
- *Skills:* deep learning, computer vision, data pipeline engineering, analytical research, project management
- *Achievements:* Significant accuracy and efficiency of CV models, building robust infrastructure to put models in production
- *Tools:* pytorch, caffe, docker, Azure, CUDA, C/C++, django, flask, rabbitmq

New York University
May 2013 - Jan 2019

Cosmological large scale structure and galaxy evolution (with Prof. Jeremy Tinker and David Hogg)

- Projects involving statistical modeling of galaxy data from the largest survey made to date (SDSS) as part of a large scientific collaboration (1000s of researchers), in order to understand the universe's underlying dark matter structure and how it affects the galaxy distribution
- *Skills:* Mathematical modeling, Bayesian inference, large datasets, MCMC, numerical simulation, parallel computing, problem-solving, scientific writing/presentation, data analysis, visualisation, literature review
- *Achievements:* Made scientific-grade measurements and analysis for several papers, presented at conferences across USA, mentored student researchers, made contributions to widely-used astronomy code
- *Tools:* julia, python (scipy, cython, emcee, matplotlib…), C, bash, PBS, MPI, SQL

Various Locations
2012 - Present

Data-hacking projects

- Participated in hackathons, classwork, and personal projects with diverse datasets (astronomy, web, gov/geo, financial, hardware sensors) to study trends and to understand and test novel techniques and models.
- *Skills:* Data-mining, statistical modeling, machine learning, data visualisation, financial modeling, deep learning, project presentation
- *Tools:* python, git, javascript, julia, R, SQL, Hadoop, AWS, pytorch, raspberry pi, and more, generally staying current on developments in tech tools

New York University
Mar 2012 - Aug 2013

Probabilistic Sky Catalogue (with Prof. David Hogg)

- Constructing models for 100k+ astronomical images to build a probabilistic catalogue with astrometry.net
- *Skills:* Statistical modeling, data mining, visualisation, model selection

University of Aarhus, Denmark
Sep 2010 - Jan 2011

Asteroseismology thesis project (with Prof. Jørgen Christensen-Dalsgaard)

- *Skills:* Numerical simulation and astrophysical modeling, data analysis, scientific presentation
- Resulted in important corrections to widely-used astrophysical simulation code

UC Santa Barbara, California
Jun 2010 - Sep 2010

Studying structure and function of Proteorhodopsin in Songi Han lab

- *Skills:* DNA mutation, protein expression and isolation, MRI signal analysis, presentation
- This project was done as part of a competitive research experience funded by Biomedical Diagnostics Institute in Dublin, Ireland