

# Kilian Walsh

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Astrophysicist-turned-ML-scientist-engineer, proficient in statistical modeling, deep learning for computer vision and NLP, data engineering, and MLOps. Primary languages are python, julia, C/C++ in Linux. Open source contributor, passionate about the latest technology, developments in software tools and data science methods. Experienced educator and team collaborator, communicating complex topics at technical and lay levels. Speaks English and German fluently, intermediate French and basic Mandarin and Swahili. Enjoys sports (esp. swimming, cycling, sailing), woodworking (incl. boats, timber framing, and musical instruments), bicycle/motorcycle maintenance, gardening, brewing and baking, reading, volunteering and civic engagement.

## Work

### Artisight Inc.

*Mar 2019 - Present*

#### Machine Learning Scientist-Engineer

- wearing many hats in an early stage (starting headcount of 5) healthcare technology startup
- built entire research and end-to-end deployment of on-prem infrastructures for IoT sensor data in hospitals
- 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
- Sat voluntary advanced exams to win competitive *Foundation Scholarship*, granting free tuition, housing, meals, and stipend

## Research & Projects

### Artisight Inc.

*March 2019 - Present*

#### Computer Vision and Natural Language research and ML infrastructure engineering

- building computer vision algorithms deployed in hospital automation systems
- employing NLP and dialogue models for virtual assistant systems
- *Skills:* deep learning, self-supervised learning, computer vision, object detection, audio processing, NLU, data pipeline engineering, MLOps, project management
- *Achievements:* Significant accuracy and efficiency of models, built robust infrastructure to deploy on site
- *Tools:* pytorch, caffe, hydra, docker, Azure, CUDA, NVIDIA TensorRT and Triton, NVIDIA TAO, C/C++, django, flask, rabbitmq, kafka

### 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, 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](https://astrometry.net)
- *Skills:* Statistical modeling, data mining, visualisation, model selection

### University of Aarhus, Denmark

*Sep 2010 - Jan 2011*

#### Asteroseismology thesis project (with Prof. Jorgen 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
- Part of a competitive research experience funded by Biomedical Diagnostics Institute in Ireland