

Batuhan Yildirim

PHD PHYSICS · UNIVERSITY OF CAMBRIDGE

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Education

University of Cambridge

Cambridge, UK

PHD PHYSICS - MOLECULAR ENGINEERING GROUP

Oct. 2018 - Oct. 2022

- Materials characterisation using deep learning - developing segmentation methods to detect, locate and quantify systems of particles from electron microscopy (EM) images; estimating small-angle scattering intensity functions from EM images.
- Materials discovery/design using deep learning - generative models for inorganic crystal structures and graph neural networks for structure-property prediction.

Queen Mary, University of London

London, UK

MSC DATA SCIENCE

Sep. 2017 - Sep. 2018

- Notable examinations: Machine Learning - 90%, Computer Vision and Deep Learning - 85%, Applied Statistics - 84%.
- Thesis - Unsupervised deep learning for optical flow estimation.

University of Manchester

Manchester, UK

MENG MATERIALS SCIENCE AND ENGINEERING

Sep. 2013 - Sep. 2017

- First-Class Honours - awarded the Rolls-Royce/Tin Plate Workers prize for finishing top of the class during my 3rd year.

Skills

Programming	Python; MATLAB; Git; LaTeX.
Machine Learning	PyTorch; Keras; sklearn; ability to design and implement machine/deep learning pipelines.
Research	ability to conceptualise and implement ideas; ability to turn papers into code and results.
Languages	English, Turkish

Honors & Awards

2020	College Senior Scholarship 2020 (£350) , Fitzwilliam College, University of Cambridge - awarded in recognition of significant research progress made during a year which has been severely impacted by COVID-19.	Cambridge, UK
2019	College Senior Scholarship 2019 (£350) , Fitzwilliam College, University of Cambridge - awarded on the basis of excellent work to the highest performing PhD students.	Cambridge, UK
2018	2nd Place (£5000) , Citadel Dublin DataOpen.	Dublin, Ireland
2017	Rolls-Royce/Tin-Plate Workers Award (£250) , University of Manchester - awarded for finishing top of my class (3rd year).	Manchester, UK

Employment Experience

StatusToday

London, UK

DATA SCIENCE INTERN

Jun. 2018 - Oct. 2018

- Implemented machine learning models to classify user activity from automated system activity: the model incorporated methods to deal with class imbalance and data leak.
- Deployed model to production, leading to more accurate employee insights and features computed by StatusToday.

Rolls-Royce Motor Cars

Chichester, UK

MATERIALS AND PROCESS ENGINEER INTERN

Jun. 2015 - Jun. 2016

- Development of automotive components by failure analysis and functional testing.
- Researched the suitability of using 3D-printed components in production vehicles.
- Collected and analysed data to provide detailed technical forensic reports on damaged components.

Projects and Open-Source

ImageDataExtractor 2.0 – Molecular Engineering Group (Cavendish Laboratory)

Cambridge, UK

CORE DEVELOPER

2020 - PRESENT

- An open-source Python library for electron microscopy image quantification.
- <https://github.com/by256/imagedataextractor> (will be made public very soon).

- An open-source Python library for fast computation of 2D and 3D radial distribution functions.
- <https://github.com/by256/rdfp>

ChemDataExtractor – Molecular Engineering Group (Cavendish Laboratory)

- An open-source Python library for automatic extraction of chemical information from scientific documents.
- Maintaining and pushing features to my research group's open source machine learning based chemical information extraction software.

Publications

- B. Yildirim*, J. M. Cole, "Bayesian Particle Instance Segmentation for Electron Microscopy Image Quantification", J. Chem. Inf. Model. **(2021)**
<https://doi.org/10.1021/acs.jcim.xxxxxxx>
Currently under review
- C. J. Court*, B. Yildirim*, A. Jain, J. M. Cole, "3-D Inorganic Crystal Structure Generation and Property Prediction via Representation Learning", J. Chem. Inf. Model. **(2020)**
<https://doi.org/10.1021/acs.jcim.0c00464>
** - equal contribution*
- K. T. Mukaddem, E. J. Beard, B. Yildirim, J. M. Cole, "ImageDataExtractor: A Tool to Extract and Quantify Data from Microscopy Images", J. Chem. Inf. Model. **(2019)**
<https://doi.org/10.1021/acs.jcim.9b00734>