

Dennis (Denizhan Akar)

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EDUCATION

University of Cambridge

2021 - 2022

MPhil in Advanced Computer Science

- Pass with distinction with 81.20% GPA.
- Awarded the £5,000 ACS MPhil Scholarship for academic excellence.
- Researched geometric ML for molecular graphs (drug discovery) supervised by Prof Pietro Liò and Cristian Bodnar.

University of Manchester

2018 - 2021

BSc Computer Science and Mathematics

- First Class Honours with 83.36% GPA.
- Awarded Certificate of Excellence for top 10% graduating students.

EXPERIENCE

SERI MATS: Mechanistic Interpretability (Neel Nanda) - Research Fellow

Nov 2022 - Jan 2023

- Applied the original and extended logit lens to the IOI task across a set of GPT-2 sized models (extended DLA). Extended logit lens uses consecutive layers at the end of the model to map the residual stream to logit space.
- Found the tendency for certain models (e.g. GPT-Neo) to "flip" i.e. assign an *extremely low probability* throughout the model to the token that it will eventually output and used extended DLA to analyze how this tendency changes.

CancerAI (University of Cambridge) - Research Assistant

Jul 2022 - Oct 2022

- Researched explainable AI for use by clinical oncologists using **Tensorflow** and **PyTorch**.
- Developed front-end for VIIDA, an application for analyzing, modelling, explaining, and predicting cancer-related data with **Flask** and **React**.

Cambridge Cancer Genomics - Software Engineer Intern

Jun 2019 - Sep 2019

- Integrated features and fixed bugs for the precision oncology platform OncOS backend using **Python** and **Flask**.
- Built a **full-stack** internal monitoring system for OncOS infrastructure to manage genomic data and processes.
- Researched variational autoencoder algorithms related to DNA sequence compression for SomaticNET, a neural network for evaluating tumor variants, using **Tensorflow (Python)**, **Bash**, **pysam** and **Annoy**.

PROJECTS

Geometric CW Networks - MPhil Thesis

2021 - 2022

- Introduced geometric inductive priors [E(3) invariance and equivariance] to a GNN with a topological inductive prior, in this case CW Networks (CWNs), an architecture in which graphs are "lifted" into higher order hypergraphs using CW complexes, to construct Geometric CW Networks (GCWNs).
- Used **PyTorch**, **PyTorch Geometric**, **gudhi**.

Topological Neural Processes - BSc Thesis

2020 - 2021

- Built a novel machine learning model for extracting latent information of topological structures of input (topological data analysis) for Conditional Neural Processes (a neural model which meta-learns a stochastic process) using **Tensorflow**, **matplotlib**, **pickle**, **gudhi**, and **numpy**; supervised by Dr Tingting Mu and Cristian Bodnar.

Stendhal Game - Team Leader

2019

- Contributed to and collaborated on the **Java open source** game Stendhal as the **team leader** of 7 people.
- Worked with rigorous testing with **JUnit** in an **agile** environment to ensure new features were bug-free.

LEADERSHIP

Hyperloop Manchester - Lead Software Engineer

2019

Led a team of 10 computer scientists and electronics engineers to produce software and machine learning components for the construction of the University of Manchester's Hyperloop prototype in **Python**, **R**, and **Java**.

University of Manchester - PASS Leader

2019 - 2020

Led weekly sessions in which I contributed to the development of Peer Support. Worked with a team of PASS Leaders to help 30 first-year students facilitate their knowledge and increase student understanding and morale.