

Rehan Zuberi

Computational Biology MPhil student at the University of Cambridge

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ACADEMIC EXPERIENCE

University of Cambridge, Cambridge, UK

MPhil in Computational Biology, 1-year degree

Expected Graduation: August 2024

- The core modules are: bioinformatics, deep learning, scientific programming (R & Julia), genomics, molecular and systems biology
- This master's program is concluded by a 3-month internship

University of Sussex, Brighton, UK

BSc in Computer Science & AI, 3-year degree

First-Class Honours; final grade of 79%

Graduated in July 2023

- 18 modules were Computer Science, Programming and Mathematics based (e.g Fundamentals of Machine Learning, Computer Vision, Mathematical Concepts)
- 6 modules were Neuroscience and Biology based (e.g Principles of Neuronal Function, Neural Circuits)
- Student representative for 2nd-year Computer Science & AI students

RESEARCH EXPERIENCE

Optimising Cellpose for Efficient Cell and Nuclei Segmentation

May 2023 – July 2023

Cell Cycle Control Hoeghegger Laboratory, Supervised by Dr Helfrid Hoeghegger and Dr Ivor Simpson

- This project aims to develop a method for knowledge distilling Cellpose, resulting in finely tuned cell segmentation models with optimised speed and memory usage
- We reported a 19% reduction in segmentation accuracy for a 5 times faster model and a reduction in memory consumption by a factor of 3.9 compared to Cellpose
- The approach is useful for high-volume applications where time and memory consumption are rate-limiting parameters, the model is also adaptable to perform classification and tracking
- Presenting poster to the Francis Crick Institute's BioImage Analysis Symposium

Using a Cell Segmenting U-Net's Intermediary Features for Tracking

Sept 2022 – May 2023

Cell Cycle Control Hoeghegger Laboratory, Supervised by Dr Helfrid Hoeghegger and Dr Ivor Simpson

- Part of bachelor's dissertation, aimed to use the descriptive features of a U-Net when inputted with cell images to track the cells for improved model efficiency
- The developed method achieved a 98% pair-wise accuracy for cell tracking
- Presented poster at the BeAI conference held at the University of Sussex
- Received the Chartered Institute for IT Prize for Top Five in Computer Science/IT Project from the British Computer Society

Building One Model to Segment and Classify Cells

June 2022 – July 2022

Cell Cycle Control Hoeghegger Laboratory, Supervised by Dr Helfrid Hoeghegger and Dr Ivor Simpson

- Aimed to build a unified Machine Learning model to segment and classify cells in microscopy pictures
- Fine-tuned U-Net models for cell segmentation, achieved a 0.95 IoU score
- Built a CNN model to classify cells into their cell cycle phase, achieved a 69% accuracy

AWARDS

The Chartered Institute for IT Prize for Top Five in Computer Science/IT Project

June 2023

Awarded for Final Year Dissertation Project

- Received for dissertation project on Unifying Cell Segmentation and Tracking Models to reduce Time and Memory consumption
- Delivered by the British Computing Society including a 1-year membership

Learning Together Award

July 2021

Awarded for Peer Assisted Learning tutoring work

- Received for the collaboration offered by our team between university staff and students
- Recognised for our collaborative efforts in providing one-to-one, group, and workshop-based academic support to students

EMPLOYMENT HELD

- Mathematics and Data Structures Teaching Assistant** | *University of Sussex* Sept 2022 – Jan 2023
- Taught the mathematical seminars, working through each week's problem sheet
 - Held the mathematical open office hours for peer-to-peer tutoring on concepts
 - Taught the data structures and algorithms labs, taking students through the coding problem set
 - Produced new exercises and organising revision sessions for struggling students
- Peer Assisted Learning Tutor** | *University of Sussex* Aug 2021 – Aug 2023
- Tutored 1st and 2nd-year Computer Science students
 - Received the Learning Together Award as recognition of the tutoring team's work
 - Developed a week-long Python 3 introduction course for Data Science MSc students
 - Led three semester-long workshops on Machine Learning, Mathematics and Java programming
- Intern in the Software and Web development team** | *Bouygues Telecom* June 2021 – July 2021
- Daily usage of Github, CI & CD
 - Developed web apps with API data collection, integrated Java unit tests into various projects, built a NodeJS backend server
- Intern in the IT department** | *Mirabaud & Co. Private Bank* Aug 2019; June 2020 – Sept 2020

VOLUNTEERING

- Buddy Scheme volunteer** | *University of Sussex*
- Canteen & activities volunteer** | *Le Caré (soup kitchen)*

EXTRACURRICULAR ACTIVITIES

- Theatrical Improvisation group**
- Participated in two sold-out representations as a main troupe member
 - Learning to figure out unknown environments with the help of teammates through improvised theatrical scenes
 - Helping to organise sessions, workshops and events for beginners and intermediate improvisers
- Data Science Society** | *University of Sussex*
- A student led society to make the Data Science field more accessible, promote academic achievements and general curiosity on big data and its interdisciplinarity
- Hack Sussex Society** | *University of Sussex*
- A student led society that organizes coding events, hackathons, workshops and socials
 - Participating in coding competitions, our team achieved 1st place in the VarsityCode 2021 competition
- Creative writing group - DAAR inc.**
- Writing music with group members and learning to manage an online community
 - Learning to build projects on various media platforms with image manipulation, video editing and audio equipment

PERSONAL

Born in a multicultural family: Pakistani and French.
Holding a triple nationality as I was born American, my mother is of French nationality, my father is of Pakistani nationality, and I lived in Switzerland for most of my youth.
I speak English and French fluently.