

Education

UNSW 2022-2026 WAM: 84.7

Advanced Science (Neuroscience major with honours) and Computer Science (Artificial intelligence)

Notable courses

- <i>COMP9418: Advanced Topics in Statistical Machine Learning</i>	81
- <i>COMP917: Machine Learning and Data Mining</i>	87
- <i>COMP2511: Object Oriented Design and Programming</i>	97
- <i>ANAT3411: Neuroanatomy</i>	94

Awards

- Summer research scholarship 2023-2024
- CSE Dean's list 2022

Caringbah High School 2016-2021 ATAR: 95.50

- Outstanding Diligence award semesters 1 & 2 2021
- HSC: Software Design and Development, Math Ext 2, English Adv, Chemistry, Physics

Experience

UNSW School of Psychology / Behavioural Neuroscience

Behavioural Neuroscience Research Assistant 2023-Current

Independent handling of research including various scripting pipelines, machine learning and data analysis.

- Applied supervised and unsupervised ML methods including classifiers, clustering and pose-estimation.
- Modified existing open-source methods such as Deeplabcut and Keypoint-MoSeq to extract additional data and tailor to specific behavioural use-cases
- Designing and updating existing data analysis and organisation pipelines with interactive GUIs, modularity and appropriate code practices
- Synced video, coordinate and behaviour data across various inputs
- Designed a web application to view full virus data and history, track volume and aliquot progress using custom qr codes, and automated label printing with PowerShell.

Summer Research Scholarship 2023-2024

- Performed whole-brain correlational graph analyses and visualisation including in-silico lesioning and its impact on network communicability
- Applied CNMFe on miniscope fluorescence time-series to identify and calculate individual cell activities, relevant behavioural encoding and correlation of cell encoding population with behavioural metrics

Previous positions

Sales JB Hi-Fi Miranda 2023-2024

- Identified customers' problems and provided complete solutions.
- Engaged with a variety of clients and topics including games, tech and IT
- Met and exceeded sales quota in games and tech

ELS Note Taker UNSW

2022-2024

- Lecture notes for equitable learning services.

HSC Tutoring

2022-2024

- Communicated physics, science and math topics to students in years 8,10-12.

Café all-rounder Shelly Park Shop

2019-2022

- Performed a wide variety of responsibilities, high volumes of customers and key roles including opening shifts

Extracurriculars

UNSW Neuroscience Society

2024-2025

- Founding executive and arc delegate
- Followed, communicated and liaised with faculty, Arc UNSW and fellow executives
- Organized Arc affiliation, grants, form processes and events

UNSW Virtual Reality Society

2022-2026

- Founding executive, President 2023 - Current
- Managing fellow executives, liaising with UNSW Immersive Entertainment for collaborations in game development events and more
- Organising VR events including presence at HobbyCon and Games Galore
- MegaLAN organiser: managing VRSoc executives and in-person presence at UNSW's biggest LAN event (>500 participants)
- Arc "VIP"

UNSW School of Biomedical Sciences Student Rep 2024

- Attending UNSW SBMS Head meetings to participate in discussions involving postgraduate and undergraduate studies, state of research, student motivations and needs

Projects

Pokérogue (open-source contributions)

- Pokemon fangame with over 1 million users
- Implementing user feedback, bugfixing, PR approval
- Game functionality, testing, QA and git management

Virus Registry Web Application

- Web application for registering and tracking viruses using React, Flask and Google APIs
- Inbuilt QR code scanning and data overlays in camera view
- Web scraping to autofill virus data from AddGene registries
- PowerShell automation to automatically print labels for new viruses

MRI Viewer and Lacune Annotation System (COMP3900)

- Web-based CornerstoneJS MRI viewer with 3D segmentations and custom tools for annotation
- User, scan and annotation management, tracking of progress

Markov Network for Office Occupancy Prediction (COMP9418)

- Designed a Markov Network with weights learnt from provided occupancy data
- Performed cost analysis and accuracy to improve features such as time-based transitions

Sea Turtle Semantic Segmentation Ensemble (COMP9517)

- Training of DeepSeekV3, U-Net and FCN and combined Decision-Tree ensemble
- IOU, loss and per-segment analysis comparisons between parts and ensemble

Whole-brain single-cell network analysis

- Network analysis of graphs derived from whole-brain single-cell cFos activity
- Centrality measures, community detection and in-silico lesions

Pose-estimation and behaviour clustering in rodents

- Applied and customised Deeplabcut and Keypoint-MoSeq ML approaches for pose coordinate extraction and behaviour clustering respectively
- Matched coordinates across subjects and to time-points of interest e.g. lever pressing

Miniscope CNMFe and cell encoding analysis

- Processing pipeline of miniscope calcium fluorescence videos using CNMFe to extract per-cell time-series activity
- Encoding pipeline from cell activity and behaviour time-points to identify cell populations and their correlation with behaviour outcomes

Skills

Python (strong)

- Extensive experience with data analysis, graphing, statistics, machine learning
- Jupyter notebook and ipywidget, developing GUIs with ipywidget, tkinter, Object-Oriented methods
- Flask, Scikit-Learn, PyTorch, TensorFlow, Matplotlib, Numpy, Pandas and more
- Custom workflows and ground-up machine-learning

Javascript & Typescript (strong)

- Built web frontends, using Material UI, TailwindCSS, React and Vite and NextJS

Java

- Focused on software architecture, good code-practices and OOP

C & MIPS

- Implemented various algorithm for problem-solving in C and MIPS
- Low-level fundamentals

C#

- Unity Game Dev projects including VR Support

Statistics & Analysis

- ANOVA, t-testing, Chi-squared, correlations etc. implemented in Python, R and Prism
- Various exploratory data analyses on coordinate data, time-series, matrices, networks, machine learning classifiers and clustering.

Data Visualisation

- Matplotlib, Seaborn, Prism and Illustrator
- Experience with 2D multivariate and 3D data, heatmaps, graph network visualisation
- Brainrender for brain region and network visualisations
- Blender 3D modellings and image effects

3D Modelling, CAD and 3D Printing

- Fusion360, Blender
- Parametric modelling, working with tolerances and designing to fit pre-existing structures
- Highly familiar with 3D printing and 3D printers