Ashkan **Alvand** (Ph.D.)

EDUCATION

2018-2024	University of Auckland	Doctor of Philosophy, Psychology
2014-2016	University of Auckland	Master of Engineering (1st Class Honors), Information Technology
2010-2014	University of Auckland	Bachelor of Engineering, Information Technology

WORK EXPERIENCE

Liggins Institute, Auckland, NZ

Postdoctoral Research Fellow, Feb 2023 - Sep 2023

- Analyzed big datasets (1+ TB) on two computer vision projects with 200+ participants' data

- Developed Bash scripts using docker containers and Python packages (e.g., Niprep, Nilearn) for data organization, quality check and cleaning

- Developed image processing and analysis pipelines using Bash and Matlab for semi-automated image segmentations, alignment, registration, noise reduction and feature extractions

- Configured Ubuntu systems on cloud platform (NeCTAR) for data warehousing, organisation and processing (connection through WinSCP, SSH, PuTTY)

- Developed statistical analysis pipeline on randomised control trial dataset using *t*-test, histogram and permutation tests (Matlab, Bash) for assessing biomarkers on babies' brain growth

- Communicated insights with multidisciplinary teams by writing reports and presentations

University of Auckland, NZ

Doctoral Researcher, 2018-2023

- Authored/co-authored 5 original [research articles](#) and reviews published in peer-reviewed journals, contributing to manuscript writing, design of controlled hypothesis-driven experiments, literature reviews, data plotting (Python, Matlab), schematic drawing, and statistical analysis (*t* test, ANOVA, linear regression, non-parametric tests with Matlab statistical tools, SPSS, and FSL PALM)

- Developed an image processing and analysis pipeline for multimodal imaging dataset (fMRI/dMRI/SMRI) using Matlab, Bash, docker container, Python (Tedana, Nilearn, Nibabel), for semi-automated image segmentation, registration and denoising, which was subsequently published [here](#) and [here](#)

- Created 15+ pipelines for implementing graph algorithms (community detection, random forest etc.) utilizing Matlab, with the methodology and results published in top tier journal [here](#) and [here](#)

- Conducted two large-scale human project on 70+ clients by designing project's plans, writing SOPs, strategizing data collection (e.g., Human recruitment, tests, survey, questionnaire and interviews)

- Mentored postgraduate students (2 Masters), tutored course labs for over 100 graduate students and volunteered as committee member in multiple student-led societies for organizing workshops/seminars

- Collaborated with international researchers on two global research for improving cross-species neuroimaging pipelines, published in top tier journal of [Neuron](#)

- Managed $80k in research funding for my projects and authored mobility grant applications for studies I designed, securing over $6k in funding from sources such as [EMC](#)

SELECTED PROJECTS

Interactive brain systems in children with APD
Identifying functional biomarkers in the brains of children diagnosed with APD

- Implemented graph theory framework using Matlab and C++ for applying community clustering algorithms (Louvain, Infomap, Leiden), hub detection as well as topology-based algorithms for modeling and finding relationship (i.e., networks) on data points

- Implemented evaluation procedure such as intra/inter subject reproducibility tests for comparing different brain parcellation pipelines for accurately segmenting brain regions in pediatric population, resulted with 76% accuracy

- Implemented multivariate statistical tests such as ANOVA, ANCOVA, GLM, permutation and correlation tests for assessing brain-behavior relationship

- Wrote Bash scripts and utilised Python packages (e.g., Pybids) and neuroimaging tools (e.g., dcm2niix) for structuring and formatting multimodal dataset

- Performed performance and efficacy tests such as pearson's r, Spearman' rho and temporal DOF (Matlab) on fMRI denoising pipelines resulted with 20% improvement in the pipeline selection

- Processed and visualized fMRI time series for extracting signal from noise based on Matlab and Python (Nilearn) tools in imaging platform (e.g., FSLview)

- Visualized study results using MATLAB visualization functions and Python (e.g., Nilearn) for plotting distributions, brain's region of interests and network simulation

Brain's wiring in children with APD

- Implemented mathematical frameworks for modeling brain's graph for assessing network's backbone structure and anomaly detection (alteration) using minimum spanning tree, community, rich-club algorithms (Matlab)

- Wrote scripts for utilizing tracking algorithms (FACT) for modeling water molecules diffusion in brain's tissues (docker container, Bash and Matlab)

- Developed statistical analysis scripts such as multivariate tests, network anomaly test for assessing the relationship between network measures, brain's tissue and behavioral data points (SPSS, Matlab, FSL PALM)

TECHNOLOGIES

Matlab, Python, Docker, Git, Linux, SPSS, SAS, Office suite

AWARDS

- Eisdell Moore Centre mobility grant ($2k NZD)   Nov 2022
- Travel award from Child Mind Institute ($1.2k USD)   Sep 2019
- Faculty of Science full tuition award ($36k NZD)   2018-2022

CERTIFICATION/TRAINING

- MATLAB: LinkedIn Skill Assessment
- Linux: LinkedIn Skill Assessment
- Bash: LinkedIn Skill Assessment
- Python: LinkedIn Skill Assessment
- Power BI: Dashboards, LinkedIn
- Ngā Paerewa Te Tiriti: Nov 2023
- Research Methods: The UoA, 2019
- Fundamental of network science, 2015