Fereshteh Nayyeri, PhD

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About Me

Postdoctoral researcher specialising in AI, computer vision, and deep learning, with real-world applications across domains including civil engineering, environmental science, and medical imaging. Experienced in cross-sector collaborations, including projects with CSIRO and government agencies, and recognised as an AFHEA for excellence in research-led teaching.

Key Skills

- Python, Flask, Shell Scripting (Linux), HTML/CSS
- AWS, GCP
- Jira, Tableau, Power BI,
- Data Modeling, Forecasting

Professional Experience

Postdoctoral Research Fellow | Data61, CSIRO, Australia | 01/2023-present
Project1: Using AI and cameras to identify and monitor litter, link
To address the pressing issue of marine debris by leveraging deep learning techniques to estimate the volume of floating litter in waterways and identify key hotspots.

- Managed the extensive image dataset captured by trail cameras strategically positioned across various waterways in Sydney, Australia.
- Created a comprehensive catalogue detailing different types of litter observed in the waterways, categorising them into distinct classes for further analysis and classification.
- Implemented and train state-of-the-art artificial intelligence models to detect and classify marine litter types effectively.
- Ending Plastic Waste Symposium: Presentation
- News: 7News Australia

Project2: Development of Local Machine Web Application for Image Analysis Using ML and Visualisation.

- Engineered and designed a robust web-based application to operate exclusively on local machines for running pre-trained machine learning models and presenting data analysis results.
- Leveraged Flask, a web framework written in Python programming language, engineered a comprehensive application through intuitive visual interfaces.

Casual Researcher | Griffith University, Australia | 08/2021 -12/2021
Project: Predicting Koala Road Crossing Behaviours using AI-Powered Observation Network, link

- Research on a pilot study "Study to train AI for koala 'face recognition' at crossings" in order to use 'facial recognition' technology at koala crossing locations across South East Queensland
- Implementing methodology based on artificial neural network and deep learning algorithms with Python programming language and Tensorflow framework for detection and classification of koalas to apply facial expression techniques to determine how koalas are using them and ultimately provide research-based planning to help protect the declining population.

Postdoctoral Research Fellow | Central Queensland University, Australia | 06/2020 - 06/2021
Project: An Automated System for the Analysis of Road Safety and Conditions, link

- Research on an ARC Linkage Projects titled "An automated system for the analysis of road safety and conditions".
- Developed a database of road attributes and signs from DTMR videos and annotated the data.
- Conducted experiments using deep learning architecture on high performance computers (HPC).

- Implemented methodology based on artificial neural network and deep learning algorithms with Python programming language and Tensorflow framework for detection and classification of road speed limit signs.
- Attended regular meetings with DTMR (industry partner in the mentioned ARC Linkage Projects) and made a number of presentations on the progress of the project.

Multidisciplinary Project Collaboration | Griffith University, Australia | 07/2016 - 11/2018

- Collaborative multidisciplinary project with civil engineering research group
- Successfully designed, programmed and executed a structure/ texture separation technique for crack detection, published in a high impact factor journal (6.208)

Graduate Research Assistant | National University (UKM), Malaysia | 02/2014 - 11/2015

Project: Designing and developing the algorithm to correct respiratory motion from PET/CT lung cancer images

Biomedical imaging & Signal processing research group

- Researching in the area of biomedical imaging techniques such as image reconstruction and respiratory motion correction
- Identifying technology limitations and deficiencies in existing PET/CT imaging systems and associated processes, procedures and methods
- Designing and developing the algorithm of biomedical image reconstruction
- Programming the techniques of biomedical image reconstruction, processing and analysis using MATLAB programming language
- Testing, debugging, diagnosing and correcting errors and faults in the application to ensure programs and applications perform to specification

Tutoring

1. Big Data and Social Media (7230ICT), Griffith University, Australia | 2019
   - Supported students in analysing large social media datasets using R and RStudio.
   - Provided hands-on instruction in visual analytics with Tableau and Gephi.
   - Recognised for helping students connect technical tools with real-world data insights.
2. Cyber Security Essentials (7905ICT) | Griffith University, Australia | 2019
   - Assisted in teaching key cybersecurity principles including encryption, secure protocols, and data privacy governance.
   - Provided technical support on labs using SEEDUbuntu and Oracle VM VirtualBox.
   - Helped students understand cyber threats and practical mitigation strategies.
3. Computer Systems and Networks (1007ICT, 7611ICT, 1807ICT) Griffith University, Australia | 2018
   - Delivered tutorials covering hardware, software, network fundamentals, and introductory security.
   - Helped students build foundational understanding of modern computer architecture and system integration using simulating tool for digital logic circuits.
   - Received positive feedback for simplifying complex concepts and supporting lab tasks.
4. Computer Networking Essentials (2809ICT) Griffith University, Australia | 2018
   - Delivered lab sessions aligned with the Cisco Networking Academy curriculum,
   - following Cisco's official training standards.
   - Guided students through hands-on simulations and real-world network
   - troubleshooting scenarios.

Education

Doctoral Degree in Information and Communication Technology (ICT)

PHD | Griffith University, Australia | 04/2016 – 11/2020

Thesis: Using deep neural network for foreground-background separation

- University Scholarships:
  (GUPRS) Postgraduate Research Scholarship
  (GUIPRS) International Postgraduate Research Scholarship

Master of Science in in Information Technology

National University (UKM), Malaysia | 07/2010 - 08/2013

- Thesis: Image matching using dimensionally reduced embedded Earth Mover's Distance

- GPA: 3.53 (out of 4.00)
- University excellence award for publication arising from thesis

Certificates

- Introduction to AI | TAFE NSW
- AI Fundamentals | DataCamp
- Project Management | (Fundamental level with 3-day intensive Delivery), CSIRO
- Higher Education Academy Fellowships (Associate Fellow) | Griffith University
- CCNA Routing and Switching | Cisco Networking Academy

Others

- DST Women in STEM Award
- Excellence of Publication Award
- Women in AI Australia: Keynote Speaker
- Volunteering Activity: Teaching Assistant for the End-to-End LLM Bootcamp, organized jointly by the National AI Centre (NAIC) and NVIDIA to deliver comprehensive LLM training to the Australian AI industry, over 3 full days
- Volunteering Activity: R&D Coach, Digital Technology and AI program organised by CSIRO, to assist small and medium businesses participating in the CSIRO Innovate to Grow program, over 8 weeks.

Publications

1. Malik, et al. {2025), Evolution of Employee Work Preferences Amidst COVID-19: A Social Media Analysis, Human Resource Management Journal
2. J. Barrett , et al. {2024), Smarter Cleaner Sydney Harbour: Smart Sensors in Stormwater Management, Report
3. Do, et al. {2023), SkySea: Connecting Satellite, UAV and Underwater Imagery for Benthic Habitat Mapping, Proceedings of the 2023 Workshop on UAVs in Multimedia: Capturing the World from a New Perspective.
4. W. Xing, J. Zhou, W. L. Tan, F. Nayyeri, D. Kerlin and G. Castley {2022), Dual-stream Convolutional Neural Networks for Koala Detection and Tracking, International Conference on Digital Image Computing: Techniques and Applications (DICTA), Sydney, Australia, 2022, pp. 1-7
5. F. Nayyeri, J. Zhou (2021), Multi-resolution ResNet for road and bridge crack detection, Accepted in the Conference DICTA.
6. F. Nayyeri, L. Hou, J. Zhou and H. Guan (2019), Foreground–background separation technique for crack detection, Journal of Computer-Aided Civil and Infrastructure Engineering, 34(6): 457-470.
7. F. Nayyeri, L. Hou, J. Zhou, H. Guan and A. W.-C. Liew (2018), Crack Detection via Salient Structure Extraction from Textured Background, International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-8), Brisbane, Australia, 1-8.
8. F. Nayyeri and M. F. Nasrudin (2017), Sketching Method Based on Earth Mover's Distance for Image Contour Matching, International Journal of Soft Computing, 12(1): 79-85.
9. F. Nayyeri, A. A. A. Rahni and A. Ab Aziz (2015), Modelling the GE discovery 690 PET/CT scanner. IEEE International Conference on Signal and Image Processing Applications (ICSIPA): 160-164.
10. F. Nayyeri (2015), A Review on Motion Correction Methods in Pet/Ct Images for Detection of Cancer Cells, Journal of Acta Medica Bulgarica, 42(2): 68-78.
11. F. Nayyeri and M. F. Nasrudin (2015). Book, Similarity Comparison of Images Based on Earth Mover's Distance, LAP Lambert Academic Publishing, ISBN: 978-3659697753.
12. F. Nayyeri and M. F. Nasrudin (2013), Image Matching Using Dimensionally Reduced Embedded Earth Mover's Distance, Journal of Applied Mathematics, 2013: 11.