Daniel Al Mouiee

Summary

Senior Software Engineer with robust expertise in AI, data science, and Python programming, coupled with a comprehensive background in data engineering. Part-time PhD student at the University of New South Wales. Experienced in developing tools, optimizing processes, and contributing to research projects in the field of medical physics and artificial intelligence.

Employment

The University of New South Wales   **Liverpool, Australia**
Senior Radiotherapy Software Engineer   *December 2020–Current*
- Spearheaded the development, deployment, and continuous maintenance of the cutting-edge Australian Cancer Data Network (ACDN) technology, with a particular focus on the Australian Computer-Assisted Theragnostics (AusCAT) network stack.
- Pioneered the implementation of federated learning strategies throughout the AusCAT network, meticulously evaluating various open-source frameworks to ensure optimal performance and scalability.
- Designed and established robust pipelines for the analysis of radiation toxicity, coupled with the development of intuitive clinical dashboards tailored for precise treatment prescriptions.
- Exercised leadership as a key coordinator and co-manager of the software development team, overseeing and actively participating in the execution of tasks to maintain a high standard of software craftsmanship.
- Contributed significantly to the field of radiotherapy research by conceiving and developing the open-source pydicer tool, dedicated to the standardization of data in the pursuit of advancing scientific rigor.
- Created Python scripts for Raystation treatment planning system.

Vafaee Lab - University of New South Wales   **Kensington, Sydney, Australia**
Research Associate   *September 2019–December 2020*
- Contributed to the development of machine-learning and deep-learning models for biomedical applications.
- Supported projects by maintaining Google Cloud Platform resources and data pipelines.

Clinic To Cloud Pty Ltd   **Sydney City, Australia**
Automation Engineer   *January 2019–July 2019*
- Developed automated testing frameworks for Clinic To Cloud's Practice Management Software.
- Conducted automated API testing and implemented CI/CD using tools like Postman and Azure DevOps.
- Automated visual and functional testing using Selenium.
- Increased on-boarding efficiency by developing an Outsystems Solution.

PicNet Pty Ltd   **St Leonards, Sydney, Australia**
Junior Software Engineer   *February 2018–April 2018*
- Developed web systems using ASP.NET Core and maintained databases for healthcare projects.
- Managed a team developing a RESTful API for entrepreneur and investor websites.
- Developed websites using Microsoft SharePoint.

Parramatta Community College   **Parramatta, Sydney, Australia**
HSC Mathematics and Arabic Tutor   *2016-2018*
- Tutored HSC Mathematics (General, Advanced, and Extension 1) and Arabic.

Technical and Personal Skills

- **Programming Languages:** Python, Java, Bash/Shell, C, Matlab, TeX
- **AI Skills:** TensorFlow/Keras, SKLearn, PyTorch, Federated learning tools (Flower, NVidia Flare, Vantage6)
- **Containerization:** Docker, Portainer
- **Cloud Programming:** Google Cloud Platform (GCP)
- **Web Development Skills:** Dash, Django, Github/Gitlab DevOps, RESTful APIs
- **Software Testing Skills:** Postman API testing, Selenium
- **Database Skills:** PostgreSQL, PGAdmin, Microsoft SQL Server, Microsoft Access, Pentaho Data Integration
- **Video Editing Software Skills:** Filmora
- **Languages:** Bilingual in English and Arabic

Education

Academic Qualifications

Doctorate of Bioinformatics — Sydney, Australia
University of New South Wales — *2022–current*
Investigating the application and optimization of federated learning in radiation oncology.

Master of Biomedical Engineering/Bachelor of Software Engineering — Sydney, Australia
University of New South Wales — *2016–2020*

Publications

Journal Articles

- **Outcome prediction models incorporating clinical variables for Head and Neck Squamous cell Carcinoma: A systematic review of methodological conduct and risk of bias**
  Radiotherapy and Oncology, https://doi.org/10.1016/j.radonc.2023.109629,
  March 2023

- **Standardising Breast Radiotherapy Structure Naming Conventions: A Machine Learning Approach**
  Cancers, https://doi.org/10.3390/cancers15030564,
  January 2023

- **dSeqSb: A systems biology approach to decipher dynamics of host-pathogen interactions using temporal dual RNA-seq data**
  Microb Genom, https://doi.org/10.1099/mgen.0.000862,
  September 2022

- **Classifying retinal degeneration in histological sections using deep learning**
  Translational Vision Science and Technology, https://doi.org/10.1167/tvst.10.7.9,
  June 2021

Conference presentations

- **Engineering and Physical Sciences in Medicine**
  A Comparison of Open-Source Federated Learning Tools for Secure and Effective Use in Medical Data Networks ,
  Oral Presentation, November 2023

- **Engineering and Physical Sciences in Medicine**
  Development and Application of Data Overview Dashboards to inspect Lung Cancer Cohorts' data across the AusCAT network ,

Oral Presentation, November 2023

- **Engineering and Physical Sciences in Medicine**
  Applying Multi-Modal Federated Deep Learning in Head Neck Cancer Survival Outcome Prediction ,
  Oral Presentation, November 2022

- **The Royal Australian and New Zealand College of Radiologists**
  Development of a radiotherapy dose and fractionation dashboard to reduce unnecessary variation in prescriptions,
  Oral presentation, October 2022

- **Engineering and Physical Sciences in Medicine**
  Federated Deep Learning in Head and Neck Cancer Overall Survival Prediction,
  Oral presentation, November 2021

- **The Eye and The Chip World Research Congress**
  Deep Learning Techniques to Classify Retinal Degeneration in Histological Sections,
  Poster presentation, October 2021

Notable Contributions

- **Stackoverflow**: interested in assisting other developers using Plotly's Dash tool for creating dashboards. Significant contributions to answering user questions can be found here

- **Workshops/Tutorials**: I have a passion for education, particularly in assisting others learn different subjects, being coding/programming related or other things I have interests in such as high school education (in Mathematics) or learning Arabic. My contributions include:
  - conducting a workshop titled "Radiotherapy Image Data Analysis using Python" with my colleague at the Australian Society of Medical Imaging and Radiation Therapy (ASMIRT) 2023 conference in Sydney.
  - conducting workshops during my time at the Ingham Institute and UNSW to introduce data-science tools using Python to non-coders.

- **Masters Thesis project:** *'Classifying Retinal Degeneration in Histological Sections using Deep Learning'*

  An investigation to verify and validate the use of Convolutional Neural Networks in analysing visual features of histologically stained images of feline retinae and quantify the level of retinal damage.