Mohammad Arifur Rahman

arif@themascoteers.com | 0406155493 | Horsham, VIC 3400 | https://www.linkedin.com/in/arif-bitmascot

Summary

- PhD Candidate, pursuing a Machine Learning-based Remote Sensing project, supported by Soil CRC scholarship
- 2+ years of experience as Machine Learning Engineer (PyTorch)
- 2+ years of experience in GIS (ArcGIS Pro, QGIS)
- 14+ years of professional experience in software development (Python, Java, PHP)
- Development Portfolio: **https://arf-themascoteers.github.io**
- Scholar Profile: https://scholar.google.com.au/citations?user=xR_ryDAAAAAJ
- General writing: https://noobest.medium.com
- Sample problem solving profile: http://rosalind.info/users/arifcs

Skills

- PyTorch
- Satellite/Remote Sensing with Python
- Hyperspectral/Multispectral imaging
- Speech, Audio processing
- Python, Java, PHP, JavaScript
- Grails
- MySQL, Oracle, PostgreSQL
- Bash scripting, Linux administration
- Selenium, JMeter, Postman
- ArcGIS Pro, QGIS, Google Earth Engine

Education

Federation University Australia | Victoria | Expected Finish in December 2025
Ph.D.: Machine Learning

Project: Enhancing Soil Organic Carbon Estimation through Hyperspectral Dimensionality Reduction

American International University-Bangladesh | Bangladesh
Bachelor of Science: Computer Science

GPA 3.97 out of 4

Scholarships / Awards

- PhD: Soil CRC PhD Scholarship with Top Up Funding
- BSc: Summa Cum Laude and scholarship for academic excellence

Publications

- "Deep Learning-based Adaptive Downsampling of Hyperspectral Bands for Soil Organic Carbon Estimation", IEEE Access (2025).
- "BSDR: A Data-Efficient Deep Learning-Based Hyperspectral Band Selection Algorithm Using Discrete Relaxation", Sensors 24.23 (2024): 7771.
- "Addressing Limitations of Common Methods in Attention-based Hyperspectral Band Selection Algorithms", International Conference on Digital Image Computing: Techniques and Applications (DICTA). IEEE, 2024.
- "Anti-aliasing deep image classifiers using novel depth adaptive blurring and activation function", Neurocomputing 536 (2023): 164-174.

Certifications

- Participation in the Second Active and Passive P- and L-band Experiment Airborne Field Campaign under the Leadership of Professor Jeffrey Walker, Department of Civil Engineering, Monash University.

Experience

Analyst Programmer | Wimmera CMA – Horsham, Vistoria, Australia | 06/2025 – to date

- Developed a deep learning model in PyTorch for automated frog species classification from acoustic signals, integrated into an interactive web application using Flask, Docker, and AWS.
- Developed advanced ArcGIS toolboxes to automate organization-specific geospatial workflows and repetitive tasks, improving accuracy, efficiency, and consistency in spatial data processing.
- Integrating remote sensing and machine learning technologies for environmental monitoring.
- Dynamic geospatial visualisations with ArcGIS Pro, Python, and Google Earth Engine.
- Advanced spatial analysis to evaluate terrain and vegetation health for environmental planning.
- Applying machine learning algorithms to analyze land, water, and biodiversity data.
- Collaborating with farmers to implement data-driven solutions for sustainable land management.

Machine Learning Engineer (part-time) | WebAlive Pty Ltd – Melbourne, Australia | 11/2022 – to date

- Conducted ground truthing of Sentinel-2 MSI satellite data with soil organic matter measurements to develop deep learning-based estimation models using PyTorch, contributing to high-resolution digital soil mapping
- A video clipping system using Python to filter video clips, recognizing speeches using Google Speech-To-Text
- An image processing tool using OpenCV to intelligently crop faces from images for ID cards
- A prototype for a face recognition system to identify and organize photos based on faces

Engineering Director | Bit Mascot (Pvt) Ltd - Dhaka, Bangladesh | 07/2008 - 04/2022

- Enterprise billing system comprising 10+ components on Grails, MySQL, jQuery - https://autobill.com
- A full-fledged CMS on Grails, MySQL, jQuery - https://www.webcommander.com
- Refurbished one of the pioneer CMS in Australia using Java Swing, CakePHP- https://www.webconsole.co
- Customized CI/CD system with Grails, PHP, Selenium, and BASH scripting
- Payment processing API services using CakePHP and MySQL

Software Engineer | ReliSource Technologies Limited - Dhaka, Bangladesh | 01/2007 - 06/2008

- A document management system on Java
- A music-based social networking web site on Struts 2 and jQuery

Other Commercial Projects

Detecting jaywalking incidents and predicting potential near-miss traffic collisions from real-time road camera feeds. This project was undertaken as part of the Future Mobility Living Lab (FMLL) funding initiative, conducted by the City of Casey Council.

Academic/Hobby Projects

Up to date portfolio: **https://arf-themascoteers.github.io**

- Band selection algorithm for hyperspectral data with PyTorch using discrete relaxation
- Hyperspectral image segmentation using learnable spectral indices with PyTorch
- CNN from scratch with **Python** to recognise speaker (ASR)
- Variational Autoencoder with PyTorch
- Multi-task learning to simultaneously predict age and gender from facial images with PyTorch
- Detect faces with glasses using transfer learning with PyTorch

- Soil moisture prediction using multimodal data with PyTorch
- Traffic incident simulator GUI using the Python library **Tkinter**
- Advanced map visualization of multiple soil properties using **ArcGIS Pro** and the Python library **GeoPandas**
- Conway's Game of Life simulator with **PyGame**
- Puzzle solver in C using standard graph searching algorithms
- Parallel processing system using **Java RMI**
- Game for mobile devices using **J2ME**
- File transfer application using **C**
- Console-based abstract strategy game using minimax algorithm on **C++**