

Dr.Felix Marattukalam

Personal Statement

'An astute Engineer with a passion for efficiently engineered solutions'

I am an engineer with experience in wide areas like artificial intelligence, identity, access management, biometrics, business operations, data science, radar systems, SAR for earth observation, and software security systems both in the public and private sectors. I have a Bachelors of Engineering (B.E), Masters of Technology (M.Tech) in Electronics and Telecommunications Engineering, and a PhD in Electrical and Electronics Engineering. Presently I am a Senior Engineer with Restore Lab, Wanaka, optimizing the future of earth observation using remote sensing. I consult on specialist topics for biometrics, computer vision, SAR for earth observations, radio engineering solutions and artificial intelligence applications. Essentially I have an engineering mind to solve challenging engineering problems.

Relevant Experience

2024 - present Senior Engineer, Full-time Permanent, Restore Lab Limited

General Support integration and test of SlimSAR at Merlin Labs including nominal flight planning, throughput testing and automation of flight operations

Working with the larger team, our collaborators and potential external users such as councils, Iwi, Tonkin Taylor, Waka Kotahi etc to identify relevant and responsive products and workflows

Rongowai python-based processing and operations pipeline maintenance and oversight. This includes working with the international team for updates to calibration and algorithms for the L1 and also L2 and higher order geophysical and derived products such as gridded soil-moisture, inundation and coastal change products.

Proposal and grant writing, up-to-date publication of completed work along with the presentation of findings domestically and internationally

Jan24-Jul24 Head of Advance AI Research, Watchful Limited

Lead the AI research promoting an environment of innovation and excellence. Develop and oversee all AI research projects from inception to implementation.

Day-to-day activities of the video management system design, development, and implementation, including both hardware and software.

Provide specialist advice for electrical, solar, and electronic systems for optimization and ensuring that industry health and safety standards are followed.

Mentor and develop team members in roles where support functions include the development and use of AI-based systems.

Manage the software development workflow for the company by introducing and implementing tech-stack solutions.

Provide leadership to customer-facing and operational segments of the business to ensure that requests and queries are addressed

Drafting user guides, standard operating procedures and other key documentation specifying functional information of software and hardware solutions.

2022-2024 Data Scientist-Identity, Ministry of Business, Innovation and Employment (MBIE), Immigration NZ

Day-to-day activities of the biometrics and forensics security team related to identity management. This involves application of SQL, SAS, and other DBMS to retrieve the data from the tables and wrangle them into shape using R/Python to generate meaningful insights from the data.

Provide Subject Matter Expertise (SME) in the area of security, biometrics and forensics to support the identity matching process and queries arising from Official Information Acts, Police, Interpol, and NZ Customs.

Business requirement gathering, conducting feasibility checks, performing cost-benefit analysis and solution scoping

Performing factory acceptance tests, site acceptance tests and user acceptance tests for software projects
Design and development of automated matching engines used for identity mapping in the visa, NZeTA, and border movement process.

Design and development of the rules for the manual matching process by fitting the models developed and obtaining insights from the model behaviour.

Training and supervision of employees who are new to database management systems and biometrics.

2019-2022 Senior Research Technician, *The University of Auckland*

Signal Processing, Radio, and Embedded Systems lab in-charge

Operation, repairs and calibration of all specialist equipment

Planning and implementation of Health & Safety protocols for efficient risk management

3D model design and 3D printing in-charge for signal processing and radio systems lab

Hardware and software design, documentation, development and demonstration for academic research in computer vision, biometrics and machine learning

Postgraduate and undergraduate specialist research supervision and teaching along with course design.

Specialized consultation, deployment and maintenance for on-site and off-site industry partners.

Managerial responsibilities such as panel consultant for new technical staff recruitment and training

Financial planning and resource allocation for assigned specialist facilities

2019-2021 Graduate Teaching Assistant, *The University of Auckland*

Courses Fundamentals of Computer Engineering, Artificial Intelligence and Machine Learning, Distributed Cyber-Physical Systems Design, and Embedded and Advanced Embedded System Design, Analogue and Digital Design, Electrical and Digital Systems, Electrical Engineering Design, and Radio Engineering and Communication Systems

Responsibilities Lecturing, course design, hardware & software design, simulation and testing, supervising projects

2019 Software Technology Consultant, Breeur Solutions, India

Software advisory & startup inception business consultancy

Concept design, development & software testing team lead

2018 Research Assistant, *Center for Technology Alternatives for Rural Areas, IIT Bombay, India*

Solar panel design and microcontroller design for 1 million SoULs charity project.

Course design for renewable energy courses.

2016-2018 Designated Partner and Technological Officer, Marafel solutions LLP, India

Marafel Solutions was incorporated in 2016 as a software and web development company. The company successfully completed multiple projects and was later acquired by Croadz Design and Development in November 2019 as part of merger and acquisition move.

Business consultancy, website, software as an application (SaaS) development, Software Project Management

2016-2017 Embedded Systems Developer, *Croadz Design and Development, India*

Firmware development using HTML, Java, C, C++, Matlab

Software Testing for RF systems, PCB designs (SMT)

Microcontroller & VHDL programming

Technical Expertise

Domain specific Prevention and detection protocols in security environment, investigation experience using extensive immigration data, identity management, biometrics, identity data science and security

Machine Learning Computer Vision, Machine learning, Artificial Intelligence systems for Image Recognition, experience with Yolov8, GPT and other sota models

Biometrics Identity management, biometrics, identity data science, vascular biometrics

Data Science Computer skills for data analysis, data storytelling, data mining, data modelling and data reporting

Programming Language C#, PhP, VueJS, git extensions, octopus deploy, kubernetes, C, C++, Java, System J, PLC controller, R, HTML,SAS, PowerBI, SQL, Python

Platforms Google Cloud Platform, AWS Sagemaker, Bedrock, Azure, VSCode

Integrations API integration, webhook destination design, video interface integration, ONVIF protocol implementation, Remote Network configuration and Remote video stream programming

OS	Windows, Linux and Mac OS, command line interface
Hardware Design	LT Spice, Altium Designer, CST Studio, PCB design, STM32, ATmel Programming, microchip, 3D CAD design, 3D printing, laser cutting
Methodologies	Programming methodologies and pipeline development, Lean vs agile methodology knowledge base
H & S	Health and Safety/Risk Management protocols
Communication	Radio systems Engineering and Microstrip Antenna Design, Radar, Sonar, Laser and Near Infrared Imaging, ESPs, Raspberry Pi and other hardware components
Suites	Microsoft 365 , Slack, Trello, Azure Devops, Discord, Asana, EH, ODM, retool and other tools
Functional Consulting	Business Requirement Gathering, Feasibility Check, Cost Benefit Analysis, FAT, SAT, UAT, Functional Specification and User Guide drafting
Languages	English, Hindi, Marathi, Beginner in Malayalam, te reo Māori

Education

2019-2023	PhD, Doctor of Philosophy, The University of Auckland
Specialization	Electrical & Electronic Engineering (Biometrics & Computer Vision)
2015-2017	M Tech, Master of Technology, SVKM's NMIMS
Specialization	Electronics & Telecommunications Engineering
2011-2015	B.E , Bachelor of Engineering, The University of Mumbai
Specialization	Electronics & Telecommunications Engineering

Related Experience

2024-present	Professional Teaching Fellow, The University of Auckland Lecturing ELECTENG 331:Signals and Systems and COMPSYS721: Advanced Artificial Intelligence,COMPSYS306:Artificial Intelligence and Machine Learning
2024-present	AI Research Consultant, Watchful Limited Help optimise AI capability to support growing operations in USA Design and develop IoT hardware solutions for CCTV camera systems and integrate it to the software platform using API Business requirement gathering, conducting feasibility checks, performing cost-benefit analysis and solution scoping using agile principles Advise on latest computer vision models and its application methods for Watchful software platform
2023-2024	Research Fellow, The University of Auckland Consultant for SFTI-funded shape shifting antennas project Consultant for Rongowai Science Payload project for UoA and NASA CYGNSS system
2022-Present	Guest Lecturer, The University of Auckland Lecturing Advanced Computer Systems Engineering courses CS306: Machine Learning and Artificial Intelligence and CS704: SystemJ and distributed computing
2020-2021	Swim Instructor and Lifeguard, Auckland Council Boatsafe New Zealand representative for Auckland Council Certified Trainer: Licence from AUSTSWIM Australia
2019-2021	Accounts Administrator, St.Peter's College, Auckland

Relevant Information

Immigration Status: New Zealand Permanent Resident
Drivers Licence: **Class 1 and Class 6** full drivers license with own vehicle

References

Available on request