Faith Culas

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I am an early-career software engineering researcher with industry experience, currently working at the Human Aspects of Software Engineering Lab (HASEL). My work focuses on improving software engineering tools and practices through empirical research, with research interests in developer cognition and the design of inclusive, productive software development tools that enhance software engineering workflows and developer experience.

Education

PhD in Software Engineering, *University of Auckland, New Zealand* Feb 2024 – present

Supervisors: Kelly Blincoe and Priyanka Dhopade
Thesis title: *"Advancing cognitive inclusivity in software engineering tools and practices"*

BSc(Hons) in Electronics and Telecommunications Engineering - First class, *Faculty of Engineering, University of Moratuwa, Sri Lanka* Jan 2017 – Jun 2021

Publications

1. **Faith Culas**, Reid Holmes, Thomas Fritz, Priyanka Dhopade, and Kelly Blincoe. 2026. Code Comprehension Beyond Best Practices: Exploring the Developer Cognitive Spectrum. *Accepted at JAWS Track at ICSE 2026 with a journal invite (to appear)*.
2. **Faith Culas**, Amisha Singh, Atharva Arankalle, Priyanka Dhopade, and Kelly Blincoe. 2026. Newcomers' experiences during debugging: A cognitive inclusivity perspective using GenderMag. *Information and Software Technology 190 (2026)*, 107932. https://doi.org/10.1016/j.infsof.2025.107932. *Accepted as a Journal-First paper at SANER 2026*
3. **Faith Culas**, Priyanka Dhopade, and Kelly Blincoe. 2026. Designing think-aloud studies to identify cognitive biases in software engineering tools: An experience report. *Fairness Workshop at SANER 2026* (to appear).
4. **Faith Culas**. 2025. Advancing cognitive inclusivity in software engineering tools and practices. In *Proceedings of the Doctoral Symposium at the 47th IEEE/ACM International Conference on Software Engineering (ICSE)*, 166–168. https://doi.org/10.1109/ICSE-Companion66252.2025.00049

Research Experience

PhD research student, *Faculty of Engineering, University of Auckland, New Zealand* Feb 2024 – Present

Actively conducting empirical, human-centered socio-technical research on software development tools. Design and run controlled lab studies, interviews, think-aloud sessions, and eye-tracking experiments to investigate how developers interact with software tools and practices, with a focus on cognitive inclusivity, developer productivity, and usability. Apply qualitative and quantitative analysis techniques, and leveraging large language models (LLMs) to support data analysis to derive actionable insights that inform tool design and improve developer experience.

Research Assistant, *Faculty of Engineering, University of Auckland, New Zealand* Apr 2025 – Present

Part of the ENGclusion Project. Conducted semi-structured interviews focusing on the experiences, inclusion, and early-career challenges of fresh graduates entering the engineering workforce (`https://engclusion.nz`).

Research Assistant, *Faculty of Engineering, University of Auckland, New Zealand* Apr 2024 – Jun 2024

Part of the Veracity Project. Empirically investigated the emerging concept of Veracity Debt, a form of technical debt related to trust-critical software requirements, including truth, authenticity, and demonstrability. Conducted semi-structured interviews with industry practitioners, performed qualitative analysis of interview transcripts to identify themes related to veracity, and synthesized findings into research reports (`https://veracity.wgtn.ac.nz`).

Skills and Tools

Programming: Python, Java, JavaScript
ML & AI: TensorFlow, PyTorch, Scikit-learn, LLMs (Ollama)
Research Analysis: Python, R, NVivo
Deployment: Docker, Kubernetes
Research: Interviews, lab experiments, mixed-methods analysis, experimental design, hypothesis formulation

Research Projects

Newcomer Developers' Experiences During Debugging: Research-driven project as part of my PhD investigating how newcomer developers use IDE debugging tools. Conducted controlled lab studies using the PyCharm debugger with think-aloud protocols to identify usability and cognitive challenges during debugging. Currently developing fixes for issues uncovered in the experiments by implementing a plugin using the IntelliJ Platform Plugin SDK.

Exploring Developer Cognitive Differences During Code Comprehension Using Eye-Tracking: Ongoing PhD research project investigating cognitive differences in developer code comprehension. Conducting human–computer interaction–driven empirical studies using IntelliJ IDEA as the IDE and a Tobii eye tracker, with CognitIDE used to map eye-tracking data to IDE using Java Swing. Extended CognitIDE by developing new functionality using the IntelliJ Platform Plugin SDK.

Real Time Activity Recognition and User Authentication using passive Wi-Fi: Developed as part of my bachelor's final-year project. Collected data using Software Defined Radios and trained three ML models for user authentication, activity recognition, and localization. Built a React-based UI for system monitoring.

Industry Experience

Advanced Application Developer, *Development Bank of Singapore (DBS) - Singapore* Oct 2022 – Oct 2023

Part of an enterprise-scale development team in the Treasury and Markets department, contributing to the design and implementation of financial systems. Developed data-driven dashboards using Kibana and the ELK stack to monitor and visualize daily batch jobs. Contributed to the development of Hi-P, a hyper-personalization platform for delivering customized foreign exchange rates to customers, and TDMS, a trading document management system. Implemented RESTful APIs using Java and Spring Boot with MariaDB, and deployed services on OpenShift.

Software Engineer, *ZeroBeta – Sri Lanka* Aug 2022 – Sep 2022

Developed financial software tools in a fintech environment, contributing to cloud-native and microservices-based systems. Implemented microservices using Java and developed DevOps scripts to extend cloud functionality in existing applications. Automated AWS resource provisioning and management using Bash scripting and AWS CloudFormation, supporting scalable and reliable deployment workflows.

Software Engineer, *Axiata Digital Labs – Sri Lanka* Jun 2021 – Aug 2022

Development of large-scale backend services for telecom applications serving 15 million mobile users. Developed Google MDP, an Android-facing application integrated with Google's Mobile Data Plan Sharing API, enabling users to manage mobile data plans. Implemented backend APIs and schedulers using Java and Spring Boot with Redis, MySQL, and Kafka, and deployed services on AWS. Developed notification services for 1.5 million postpaid users, wrote unit tests achieving over 80% coverage using JUnit, and Mockito, and conducted load testing with JMeter.

Software Engineer Intern, Axiata Digital Labs – Sri Lanka Jun 2019 – Dec 2019

Contributed to the development of telecom backend and web applications during an internship, including work on an Online Charging System (OCS) integrated with WSO2 Enterprise Integrator. Developed Spring Boot–based web applications for authentication and customer-facing workflows. Built a web application for online SIM registration by integrating AWS Rekognition and Google Vision OCR to automate identity verification processes.

Teaching experience

Graduate Teaching Assistant, *Faculty of Engineering, University of Auckland* Jan 2025 – Jun 2025
Advanced Software Requirements Engineering. Assisted with supplementary material for class curriculum, guest lecture, marked reports, assignments, and presentations.

Academic service

Reviewer: ICPC Tools Track 2025–2026, 2 papers in JSS journal, Junior PC Member at MSR 2026
Organizing committee (Social Media Chair) and **Student Volunteer:** ICSME 2025

Awards and Honors

Rutherford Discovery Fellowship Grant: Full scholarship with stipend awarded by the Royal Society through UoA.
Distinguished Volunteer award at ICSME 2025: Recognized for outstanding service as a student volunteer.

References

References available upon request