Amila Indika

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Education

University of Hawaii at Manoa	M.Sc. in Computer Science (GPA: 3.91/4.00)	May 2025
University of Peradeniya, Sri Lanka	B.Sc. in Computer Engineering (GPA: 3.85/4.00)	Aug 2020

Research Areas of Interest

Applied Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Software Engineering

Publications [J]ournal/[C]onference/[A]bstract/[P]reprint (*first author)

[C] **A. Indika***, C. Lee, H. Wang, J. Lisoway, A. Peruma, and R. Kazman, "Exploring Accessibility Trends and Challenges in Mobile App Development: A Study of Stack Overflow Questions," 2025, 58th Hawaii International Conference on System Sciences (HICSS), Hawaii, USA, doi: 10.48550/arXiv.2409.07945

[C] **A. Indika***, and I. Molybog, "Spreadsheet manipulation using large language models," 2025 **(in preparation)**

[C] **A. Indika***, A. Peruma, and R. Kazman, "Practitioner Views on Mobile App Accessibility: Practices and Challenges," 2025, ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM) **(submitted - under review)**

[J] Y. Hatanaka*, **A. Indika**, T. Giambelluca, and P. Sadowski, "Statistical Downscaling from Sparse Observations with Deep Learning for Mean Monthly Rainfall Projections in Hawai'i," 2025, American Meteorological Society (AMS), Journal of Artificial Intelligence for the Earth Systems (AIES) **(submitted - addressing revisions)**

[J] O. Mudannayake*, **A. Indika***, Janaka Alawatugoda, Upul Jayasinghe, and Gyu Myoung Lee, "On privacy-preserved machine learning using secure multi-party computing," 2025, Tech Science Press, Journal of Computers, Materials & Continua (CMC), **(drafted - submitting soon)**

[C] **A. Indika**, P. Y. Washington and A. Peruma*, "Performance Comparison of Binary Machine Learning Classifiers in Identifying Code Comment Types: An Exploratory Study," 2023 IEEE/ACM 2nd International Workshop on Natural Language-Based Software Engineering (NLBSE), Melbourne, Australia, 2023, pp. 20-23, doi: 10.1109/NLBSE59153.2023.00012

[C] S. Jayasundara*, **A. Indika***, and D. Herath, "Interpretable Student Performance Prediction Using Explainable Boosting Machine for Multi-Class Classification," 2022 2nd International Conference on Advanced Research in Computing (ICARC), 2022, pp. 391–396 doi: 10.1109/ICARC54489.2022.9753867 [🏆 **Best Paper Award**]

[P] **A. Indika***, N. Warusamana*, E. Welikala*, and S. Deegalla, "Ensemble stock market prediction using SVM, LSTM, and Linear Regression," Authorea Preprints, 2021. doi: 10.36227/techrxiv.16626019.v1

[A] N. Warusamana*, **A. Indika***, E. Welikala*, and S. Deegalla, "Stock Market Prediction using SVM, LSTM, and Linear Regression," ESCaPe 2020 Project Symposium, pp. 21 (link)

Research Experience

University of Hawaii at Manoa, Department of Information and Computer Science

Student Researcher | **Python, GPT, HuggingFace, Llama, Gemma, LangChain, JS** **May 2024 – Present**

advised by: Prof. Igor Molybog

- **Developed a system for translating Excel manipulation code into textual summaries**, improving the interpretability of spreadsheet automation tasks by reverse-engineering a codebase from a research paper
- Integrated large language models **(LLMs) GPT-4, Llama-3.3, Gemma2, and Mixtral-8** into the translation pipeline, enabling performance comparison across models by using **OpenAI, Groq, and Hugging Face APIs**

- Implementing a **Retrieval-Augmented Generation (RAG) pipeline** to generate JavaScript code for Excel manipulation, reducing hallucinations in LLMs by integrating contextual retrieval with **LangChain**
- **Co-authoring a research paper (in preparation)** on the code translation system, ensuring its reproducibility for researchers and developers by publicly publishing the proposed method and implementation details

Student Researcher | **Python, SQL, Git, LaTeX** **Feb 2023 – May 2025**
advised by: Prof. Anthony Peruma

- **First-authoring a research paper (in preparation)** on mobile developers' perspectives on accessibility, identifying accessibility adoption practices by analyzing survey responses from industry professionals
- **Led three Master's students** in analyzing Stack Overflow posts on mobile accessibility, identifying **seven significant mobile accessibility challenges** using **Top2Vec** topic modeling for categorization
- **First-authored a conference paper** on mobile accessibility challenges in Stack Overflow discussions, providing **three key insights** for developers and researchers by analyzing accessibility-related posts
- Implemented **BERT** and **RoBERTa** models for code comment classification, improving code documentation analysis by benchmarking against traditional supervised learning methods
- **Co-authored a conference paper** on NLP-based code comment classification, advancing automated software documentation research by evaluating machine learning models for code comprehension effectiveness

Graduate Research Assistant | **Python, TensorFlow, PyTorch, SLURM, Git, LaTeX** **May 2023 – Aug 2024**
advised by: Prof. Peter Sadowski

- Generated future rainfall forecasting maps by extracting **CMIP6 Global Climate Model (GCM)** data and applying statistical downscaling using **Python**, to support improved water resource management in Hawaii
- Implemented **Gaussian Process** and **Neural Network** models for two research projects, contributing to a **journal paper and a technical report** utilizing **GPyTorch, PyTorch, TensorFlow,** and **LaTeX**
- Collaborated with computer scientists, geographers, and industry partners, enhancing interdisciplinary research outcomes by integrating domain expertise and technical solutions
- **Presented research findings at technical workshops**, increasing project visibility and stakeholder engagement by showcasing results to tech professionals and the public

University of Peradeniya, Department of Computer Engineering, Sri Lanka
Volunteer Researcher | **LaTeX** **Mar 2022 – Feb 2024**
advised by: Dr. Upul Jayasinghe

- Co-authored a survey paper on Privacy-Preserving Machine Learning **(PPML)** using Secure Multi-Party Computing **(SMPC)**, identifying research gaps and future directions through a semi-systematic mapping study approach

Volunteer Researcher | **Python, Git, LaTeX** **Oct 2021 – Feb 2022**
advised by: Dr. Damayanthi Herath

- Developed **explainable AI (XAI) models (EBM, LIME, SHAP)** to predict student performance, **earning the best paper award at ICARC** by demonstrating model interpretability and insights
- Presented research findings at the International Conference on Advanced Research in Computing **(ICARC)**, enhancing the visibility of XAI applications in education through effective communication of results

Teaching Experience

University of Hawaii at Manoa, Department of Information and Computer Science
Graduate Teaching Assistant (TA) | **Java, C, Bash** **Aug 2024 – May 2025** | **Aug 2022 - May 2023**

- Assessed homework and provided detailed feedback for **50+ undergraduate students**, improving comprehension of complex concepts by addressing student inquiries and clarifying course material
- **Earned high student satisfaction, with 86% of 50 students** rating the TA experience 4 or 5 on a 5-point scale, demonstrating effective teaching and support through personalized guidance and interactive discussions
- Conducted hands-on demonstrations of **Wireshark** and **Vagrant**, enhancing student engagement and practical understanding of networking concepts by integrating real-world tool usage into coursework
- Courses:
  - ICS 451: Data Networks (Spring 2025, Fall 2024, Fall 2022)
  - ICS 332: Operating Systems (Spring 2023, Fall 2022)
  - ICS 355: Security and Trust I (Spring 2023)

Department of Computer Engineering, University of Peradeniya, Sri Lanka

Lecturer on Contract | **OpenCV, Python, C, Java** **Aug 2021 – Jul 2022**

- Taught undergrad computer & electrical engineering courses using structured lectures and hands-on learning
- Collaborated with senior lecturers to design coursework and assessments, improving course effectiveness and student engagement by developing homework, exams, and lesson plans
- Courses:
  - CO543: Image Processing
  - CO253: Networking for Electrical Engineering

Graduate Teaching Assistant (TA) | **Git, GitHub, Python, C, Java** **Aug 2020 – Aug 2021**

- Developed and graded assignments for undergrad courses, averaging 60 students, with structured evaluation
- **Automated grading for a web dev. course** using **GitHub Classroom**, significantly reducing grading time by implementing **automated unit tests** with **GitHub Actions**
- **Led four assistant TAs** to grade an embedded hardware course, ensuring evaluation consistency and accuracy
- Courses:
  - CO513: Advanced Computer Communication Networks (**Lead TA**)
  - CO324: Network and Web Application Design (**Lead TA**)
  - CO321: Embedded Systems (**Lead TA**)
  - CO224: Computer Architecture
  - CO323: Computer Communication Networks II

Voluntary Undergraduate Teaching Assistant **Sep 2019 – Nov 2019**

- Graded the Python labs of a first-year undergraduate course (**GP106: Computing**), averaging 420 students per semester, collaborating with ten other TAs

Work Experience

Department of Computer Engineering, University of Peradeniya, Sri Lanka

Network Administrator | **HPC, Linux-OS, Bash** **Aug 2020 – Jul 2022**

- **Administered 3 Linux servers** with dedicated GPUs/CPUs for High-Performance Computing (HPC), ensuring optimal performance and accessible research computing via proactive maintenance and resource management
- Managed FPGA, Windows, and file servers, maintaining smooth operations and user access by performing routine maintenance, storage checks, and troubleshooting server anomalies
- **Installed and troubleshot software on HPC servers**, supporting researchers with computational workloads by collaborating with lab technicians to maintain server hardware and software environments

Zone24x7 (Pvt) Ltd., Sri Lanka

Trainee Associate Software Engineer - Data Science Internship | **Python, TensorFlow** **Feb 2019 – Jul 2019**

- Developed **anomaly detection** components for **two AI projects in the KOHL's US retail chain**, improving operational efficiency by analyzing millions of log files and tabular data using machine learning
- Implemented the **OneClassSVM** algorithm to detect outliers in customer visit counts, enhancing anomaly detection accuracy for the same retail chain through advanced statistical modeling
- Led data science efforts, driving key project milestones and ensuring project success by collaborating with project managers, senior engineers, architects, and QA testers
- **Presented findings to the client and CTO** during sprint meetings, shaping decision-making and AI adoption strategies by providing key updates on AI model performance and insights

Skills

Python (6+ years) | Java (7+ years) | C (6+ years) | C++ (3+ years) | Bash (6+ years) | MySQL (3+ years) | MongoDB (1+ year) | AWS (1+ years) | Scikit-learn (5+ years) | PyTorch (5+ years) | TensorFlow (5+ years) | Optuna (2+ years) | HTML (3+ years) | CSS3 (3+ years) | JavaScript (2+ years) | LaTeX (5+ years) | OpenCV (2+ years) | HPC (4+ years) | Docker (1+ year) | R (<1 year) | Spark - PySpark (<1 year) | Machine Learning (6+ years) | Deep Learning (5+ years)

Selected Projects

Class Project: Analysis of EEG signals with 1D-CNN | **Python, MNE, Medical Data** **Jan 2024 – May 2024**

- **Reverse-engineered a codebase** from an academic research paper to analyze EEG data, enabling further experimentation and model enhancements by mastering EEG signal processing within three months
- Developed a 1D-CNN to classify EEG signals for real and imaginary tasks, improving classification accuracy through deep learning-based feature extraction
- Collaborated with three Master's students to complete the project, contributing to a technical project report and presentation that **secured an A+ grade for all team members**

Net Radiation Analysis for the Hawaiian Islands | **Python, TensorFlow, SLURM** **Aug 2023 – Dec 2023**

- Analyzed nighttime long-wave radiation across Hawaii, improving power and energy calculations for the region by using **neural network models with TensorFlow**
- Co-authored technical reports and presented findings to industry professionals, enhancing research impact by delivering insights on solar radiation trends and predictive modeling
- **Partnered with MITRE scientists** to conduct net radiation analysis, ensuring methodological rigor and applicability through interdisciplinary collaboration

Fellowships and Awards

- Spring'25 Best Master's plan B poster at the department of Computer Sciences at UH Manoa **May 2025**
- Hawaii Data Science Institute (HIDSI) Junior Data Scientist **Aug 2024 – May 2025**
- East-West Center (EWC) Student Affiliate **Aug 2022 – Present**
- HIDSI Data Science Fellowship (link) **Aug 2023 – Jul 2024**
- Best Paper Award in Technology-enhanced Learning and Teaching Track in ICARC **Feb 2022**

Mentoring Experience

- Hawaii Data Science Institute (HIDSI) CITRUS program - Mentored five computer science undergraduate students to complete five data science projects successfully over the summer of 2024

Outreach and Volunteer Activities

- Volunteer for the East-West Fest at East-West Center (EWC) **Aug 2022 – Present**
- Associate Member Institute of Engineers, Sri Lanka (IESL) – AM-27930 **Aug 2021 – Aug 2023**
- Field Representative (Undergraduate Final Year) **2019 – 2020**
- Student Member Institute of Engineers, Sri Lanka (IESL) – S-23469 **Oct 2017 - Jul 2021**
- Member of Zone24x7 Toastmasters Club **2019**
- Arunella Charity Program - Teaching Math and Science to high school students in rural areas **2016**