Bhanuka Mahanama

Department of Computer Science, Old Dominion University
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Interests **Eye-Tracking, Human-Computer & Human-Information Interaction, Multi-sensory Multi-user Environments, Computer Vision, Machine Learning, Data Science**

Education

Ph.D. in Computer Science *Aug. 2019 - Present*
Old Dominion University, Norfolk, VA GPA: 3.98
Advisor: Dr. Sampath Jayarathna
Classes: Data Science & Analytics, Machine Learning, Information visualization, Natural Language Processing, Pattern Recognition.

B.Sc. in Computer Science an Engineering *Jan. 2015 - Dec. 2018*
University of Moratuwa, Sri Lanka First Class Honours, GPA: 3.83
Dean's List distinctions (6/8 semesters)
Classes: Machine Learning, Machine Vision, Data mining & information retrieval, Micro-controllers, Computer and Network Security.

Advanced Diploma in Management Accounting *Oct. 2010 - Dec. 2014*
Chartered Institute of Management Accountants (UK)
Classes: Financial Reporting Standards (IFRS, GAAP-UK), Risk and Control, Capital Investment Decisions, Budgeting and Budgetary control.

Experience

Old Dominion University Norfolk, VA
Graduate Teaching/ Research Assistant *Aug. 2019 - Present*
- Conducted research in multi-user eye-tracking and human-computer interaction, creating frameworks for multi-sensory information retrieval and behavioral data analysis through interdisciplinary collaboration.

- Designed commodity hardware-based eye-tracking systems using parameter-efficient deep-learning models, achieving enhanced accuracy and scalability.

- Led recitation sessions, designed assignments, and mentored projects in data science and computer science courses at undergraduate and graduate levels.

Los Alamos National Laboratory Los Alamos, NM
Research Intern *May 2021 - Aug. 2021*
- Designed and developed a toolset for compliance testing for Memento Protocol (IET RFC 7089), enhancing resource validation across diverse web archives.

- Improved public and private web archive accessibility through optimized service design.

University of Moratuwa Moratuwa, Sri Lanka
Junior Consultant *Jan 2019 - Aug 2019*
- Designed and delivered laboratory sessions for Computer Networks and Industrial Computer Engineering courses in collaboration with faculty, integrating theoretical and practical components to align with industry needs.

- Mentored and evaluated undergraduate projects, providing structured guidance on topic selection, project planning, and deliverables for Software Engineering and Research Thesis.

Visiting Instructor   *Aug 2018 - Dec 2018*
- Designed and conducted practical sessions on Computer Networks, using hands-on exercises, simulations, and real-world problem-solving scenarios.

Gloabal Wavenet (Pvt) Ltd   Colombo, Sri Lanka
Associate Software Engineer   *Jan 2018 - Aug 2018*
- Designed and optimized high-performance databases using MySQL cluster, enabling efficient data management for high-throughput telecommunication fund management applications.
- Developed and integrated plugins for advanced data warehousing and analytics, improving operational efficiency and decision-making capabilities within the client organizations.

Trainee Software Engineer   *Jun 2017 - Dec 2017*
- Engineered highly available, high-throughput applications for telecommunications subscription management, leveraging Erlang, Mnesia, and MySQL cluster to ensure system reliability.
- Designed front-end applications using HTML, JavaScript, and Erlang, contributing to user-friendly interfaces and seamless system integration.

Publications   **Journals**
Bhanuka Mahanama, Yasith Jayawardana, Sundararaman Rengarajan, Gavindya Jayawardena, Leanne Chukoskie, Joseph Snider, and Sampath Jayarathna. "Eye Movement and Pupil Measures: A Review," Frontiers in Computer Science: Human-Media Interaction, 2022 **[Computer Science- Editor's Pick]**

Yasasi Abeysinghe, **Bhanuka Mahanama**, Gavindya Jayawardena, Mohan Sunkara, Andrew T. Duchowski, Vikas Ashok, and Sampath Jayarathna, "A-DisETrac Advanced Analytic Dashboard for Distributed Eye Tracking," I International Journal of Multimedia Data Engineering and Management (IJMDEM), 2024

Peer-reviewed Conferences
Bhanuka Mahanama, Vikas Ashok, Sampath Jayarathna. "Multi-Eyes: A Framework for Multi-User Eye-Tracking using Web cameras," IEEE International Conference on Information Reuse and Integration for Data Science (IEEE IRI), 2024.

Bhanuka Mahanama, Mohan Sunkara, Vikas Ashok, Sampath Jayarathna. "DisE-Trac: Distributed Eye-Tracking for Online Collaboration", ACM Conference on Human Information Interation and Retrieval (CHIIR), 2023.

Yasasi Abeysinghe, **Bhanuka Mahanama**, Gavindya Jayawardena, Mohan Sunkara, Vikas Ashok, and Sampath Jayarathna, "Gaze Analytics Dashboard for Distributed Eye Tracking", IEEE International Conference on Information Reuse and Integration for Data Science (IEEE IRI), 2023.

Kayla Pineda, **Bhanuka Mahanama**, Vikas Ashok, and Sampath Jayarathna, "Gaze-Augmented Drone Navigation", Augmented Humans International Conference (AHs), 2023.

Bhanuka Mahanama "Multi-user Eye-tracking", ACM Symposium on Eye Tracking Research and Applications (ETRA), 2022.

Bhanuka Mahanama, Gavindya Jayawardena, Yasasi Abeysinghe, Vikas Ashok, Sampath Jayarathna. "Multidisciplinary reading patterns of digital documents", ACM Symposium on Eye Tracking Research and Applications (ETRA), 2022.

Bhanuka Mahanama, Lyudmila Balakireva, Sampath Jayarathna, Michael Nelson,

and Martin Klein."Memento Validator: A toolset for Memento compliance testing", ACM/IEEE Joint Conference on Digital Libraries (JCDL), 2022.

Bhanuka Mahanama, Gavindya Jayawardena, Sampath Jayarathna "Analyzing Unconstrained Reading Patterns of Digital Documents Using Eye Tracking", ACM/IEEE Joint Conference on Digital Libraries (JCDL), 2021. **[Best Poster]**

Bhanuka Mahanama, Yasith Jayawardana, Sampath Jayarathna, "Gaze-Net: Appearance-Based Gaze Estimation using Capsule Networks". In 11th Augmented Human International Conference (AH), 2020.

Teaching

Old Dominion University
- CS 620 - Introduction to Data Science
  Teaching and Project Assistant, Spring 2023 - Spring 2024
- CS 624 - Data Analytics and Big Data
  Teaching Assistant, Fall 2021
- CS 463/563 - Cryptography for Cyber-security
  Teaching Assistant, Spring 2021
- CS 381 - Introduction to Discrete Structures
  Teaching Assistant, Fall 2020
- CS 361 - Data Structures and Algorithm
  Teaching Assistant, Spring 2020
- Research Experience for Undergraduates Summer Camp (ODU CS REU)
  Instructor and Project Mentor, Summer 2023
- Coastal Adaptation and Resilience Education Summer Camp (CARES)
  Instructor, Summer 2022
- Student ThinSat Summer Research Camp (STRS)
  Instructor, Summer 2020

University of Moratuwa
- CS 4202 - Research and Development Project
  Project Examiner and Mentor, Spring 2019
- CS 3332 - Industrial Instrumentation and Control
  Laboratory Instructor, Spring 2019
- CS 3082 - Software Engineering Project
  Project Examiner and Mentor, Spring 2019
- CS 3062 - Computer Networks
  Laboratory Instructor, Fall 2018 - Spring 2019

Services

Program Committee Member
- ACM Symposium on Eye Tracking Research and Applications (ETRA), 2025
- ACM Conversational User Interfaces (CUI), 2024 - 2025
- ACM Conference on Information and Knowledge Management (CIKM), 2023 - 2025
- ACM/IEEE Joint Conference on Digital Libraries (JCDL), 2020-2025
- IEEE Moratuwa Engineering Research Conference (MerCon), 2019

Reviewer/ Sub-reviewer
- ACM CHI Conference on Human Factors in Computing Systems, 2024
- Elsevier Expert Systems with Applications (ESWA), 2023

- IEEE Big Data, 2022
- ACM Journal on Neurocomputing, 2022
- ACM Conference on Information and Knowledge Management (CIKM), 2022
- ACM SIGIR Conference on Human Information Interaction and Retrieval (CHIIR), 2021 - 2022
- ACM Conference on Intelligent User Interfaces (IUI), 2021-2022
- Augmented Human International Conference Series (AH), 2020

Volunteering
- ACM Symposium on Eye Tracking Research and Applications (ETRA), 2022
- Trick Or Research, Old Dominion University, 2019 - 2021
- Science Connection Day, Old Dominion University, 2019
- STEAM on Spectrum, VMASC, Old Dominion University, 2019
- Institute of Engineers, Sri Lanka (IESL) Techno, Colombo, 2017

Awards & Honours
- Outstanding Review (2024) - ACM ETRA
- Best Poster (2021) - ACM/IEEE JCDL
- Outstanding Researcher (2021) - Old Dominion University
- First Class Honors (2018) - University of Moratuwa
- Edutainment Project of the Year (2016) - guru.lk/ University of Kelaniya
- Runner-Up CodeSprint (2016) - Informatics Institute of Technology
- Runner-Up Yaal Geek Challenge (2016) - Yarl IT Hub
- Dean's List Distinctions (2014-2018) - University of Moratuwa

Mentoring

Old Dominion University
- Kayla Pineda (2021-Present)
- Joshua Pablo (2023-Present)

University of Moratuwa
- Primesh Pathirana (2019)
- Bawantha Rajapaksha (2019)

Professional Affliations

Student Member, Association for Computing Machinery (ACM)
Student Member, Institute of Electrical and Electronic Engineers (IEEE)
Student Member, Institute of Engineers, Sri Lanka (IESL)
Student Member, Chartered Institute of Management Accountants (CIMA), United Kingdom