GAVINDYA JAYAWARDENA

Ph.D. Student (Computer Science) at Old Dominion University, Norfolk, VA

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WORK EXPERIENCE

Graduate Research / Teaching Assistant @ Old Dominion University
📅 Jan 2019–Present 📍 Norfolk, VA

`Python` `NumPy` `Pandas` `OpenCV` `Detectron` `WEKA` `Eye-Tracking`

Developing a real-time advanced eye movements analysis pipeline • Automated eye movements filtering from dynamically detected AOIs • Built ML models to predict ADHD from eye-tracking data.

Remote Research Assistant @ Harvard University
📅 Aug 2022–Jan 2023 📍 Cambridge, MA

`Python` `NumPy` `Pandas` `Eye-Tracking` `HCI` `Collaborative and Social Computing`

Explored the relationship between joint visual attention and joint mental effort in collaborative learning environments using eye tracking datasets.

Summer Research Intern @ Los Alamos National Laboratory
📅 Jun –Aug 2022 and Jun –Aug 2021 📍 Los Alamos, NM

`GROBID` `Python` `BeautifulSoup` `Flask` `HTML` `PHP` `Laravel` `Docker`

Built a software to extract metadata (title, abstract, keywords, authors, affiliations) and full text from scholarly PDF documents in real-time • Developed a website to review the extracted metadata.

Software Engineering Intern @ Ustocktrade (PVT) Ltd
📅 Jun 2017–Dec 2017 📍 Colombo, Sri Lanka

`Java` `OpenAPI/Swagger` `Maven` `Mustache templating` `HTML` `CSS` `JS`

Developed a program to reduce documentation efforts by automating the API documentation generation based on code changes.

RECENT PROJECTS

Joint Mental Effort (JME) as a Measure of Collaboration @ Harvard University
📅 Fall 2022 📍 Harvard University

`Python` `Pandas` `NumPy` `TobiiPro Glasses`

Generated JME as cognitive load similarity by utilizing the pupil dilation data to calculate the Index of Pupillary Activity. Explored the relationship between JME and collaboration quality, task performance, and learning gain in a multi-modal learning environment with co-located dyads.

Scholarly PDF Header & Full Text Extractor @ Los Alamos National Laboratory
📅 Summer 2021 and Summer 2022 📍 OSTI ID: 1887129

`GROBID` `Python` `BeautifulSoup` `Flask` `HTML` `CSS` `JS` `PHP` `Laravel`

Designed and developed a server to extract header information such as title, abstract, keywords, authors, affiliations, and full text from scholarly PDF documents in real-time and process extracted data. Goal was to populate LANL's Review and Approval System, RASSTI's forms with extracted data. Developed a website to review the extracted header information.

Real-time Index of Pupillary Activity @ Clemson Univserity
📅 Fall 2020 and Spring 2022 📍 DOI: 10.1016/j.procs.2022.09.189

`Python` `Pupillometry` `Eye-Tracking` `Savitzky-Golay filters`

Re-designed and developed an eye-tracked measure of pupil diameter oscillation which discriminates cognitive load in real-time using Savitzky-Golay filters.

Automate Filtering of Eye Movements @ Old Dominion University
📅 Spring 2020–Fall 2020 📍 DOI: 10.1109/IRI49571.2020.00018

`Python` `Pandas` `NumPy` `Machine Learning` `OpenCV` `Detectron`

Designed a study to detect dynamic areas of interest using object detectors and filter eye movement data that falls within the polygonal boundaries of detected dynamic AOIs.

ADHD Prediction using Eye Movements @ Old Dominion University
📅 Spring 2019 📍 DOI: 10.4018/978-1-5225-7467-5.ch003

`Machine Learning` `WEKA` `Python` `NumPy` `Pandas` `TobiiPro X2-60 eye tracker`

Developed a feasibility study to confirm eye movement data as a predictor of a diagnosis of ADHD in adults. Tree-based classifiers performed with 91% accuracy.

ABOUT ME

Ph.D. candidate seeking a full time position. Remote Research Student at Harvard University, R&D Intern at Los Alamos National Lab, Software Engineer Intern at UStockTrade (Pvt.) Ltd.

EDUCATION

Ph.D. (Computer Science)
@ Old Dominion University, Norfolk, VA
📅 01/2019–08/2024 📍 GPA: 4.00/4.00

`Eye-Tracking` `Data Science` `Information Retrieval` `Information Visualization` `Machine Learning` `Containers, & Cloud` `Natural Language Processing` `Distributed Systems` `API Management`

B.Sc (Computer Science & Engineering)
@ University of Moratuwa, Sri Lanka
📅 10/2014–12/2018 📍 GPA: 3.85/4.20

ACHIEVEMENTS

🏆 **Best Doctoral Symposium Presentation** (2022) ACM ETRA

🏆 **Best Student Poster Award** (2021,2020) ACM/IEEE JCDL

🏆 **Irwin B. Levinstein Scholarship** (2020) Old Dominion University

🏆 **Outstanding Researcher Award** (2020) Old Dominion University

🏆 **Best Student Paper Award** (2019) MERCon

🏆 **Dominion Scholar Award** (2019) Old Dominion University

🏆 **Graduated with First Class Honors** (2018) University of Moratuwa

SKILLS

`Python` `C#` `Java` `PHP` `JavaScript` `HTML` `MySQL` `MongoDB` `TensorFlow` `WEKA` `NumPy` `Pandas` `Keras` `scikit-learn` `OpenCV` `Laravel` `Ionic` `Spring` `Angular` `Maven` `Gradle` `Neuropype` `LabStreamingLayer` `PupilLabs` `Pupil Capture` `GazePoint GP3` `HTC VIVE Pro Eye` `Tobii` `Android` `Ubuntu` `Docker` `Zookeeper` `LabStreamingLayer` `Elasticsearch` `Solr`

OUTREACH

✋ **Volunteer, Old Dominion University**
CS REU (2022)
Trick or Research (2021, 2019)
Science Connection Day (2019)
STEAM on Spectrum (2019)
Great Computer Challenge (2019)

✋ **Peer Reviewer**
CIKM (2022)
JCDL (2022,2020)
CHIIR (2021)
IEEE Big Data (2021)
ETRA (2020)
IUI (2021,2020)

PUBLICATIONS

Jayawardena,Gavindya et al. (2022). "Toward a Real-Time Index of Pupillary Activity as an Indicator of Cognitive Load". In: *Proceedings of the 26th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems*. Verona, Italy.

Bhanuka Mahanama, Yasith Jayawardana, Sundararaman Rengarajan, **Gavindya Jayawardena**, Leanne Chukoskie, Joseph Snider, and Sampath Jayarathna (2021). In: *Frontiers in Computer Science – Human-Media Interaction*. Vol. 3. Frontiers Media. Chap. Eye Movement and Pupil Measures: A Review, pp. 1–22. DOI: 10.3389/fcomp.2021.733531.

Mahanama, Bhanuka, **Jayawardena, Gavindya**, and Jayarathna, Sampath (2021). "Analyzing Unconstrained Reading Patterns of Digital Documents Using Eye Tracking". In: *2021 ACM/IEEE Joint Conference on Digital Libraries (JCDL)*. IEEE, pp. 282–283.

Yasith Jayawardana, **Gavindya Jayawardena**, Andrew T. Duchowski, and Sampath Jayarathna (2021). "Metadata-Driven Eye Tracking for Real-Time Applications". In: *Proceedings of the 21st ACM Symposium on Document Engineering*. Limerick, Ireland: ACM. DOI: 10.1145/3469096.3474935.

Jayawardena, Gavindya (2020). "RAEMAP: Real-time advanced eye movements analysis pipeline". In: *ACM Symposium on Eye Tracking Research and Applications*, pp. 1–4.

Jayawardena, Gavindya and Jayarathna, Sampath (2020). "Automated Filtering of Eye Gaze Metrics from Dynamic Areas of Interest". In: *2020 IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI)*. IEEE, pp. 67–74.

Jayawardena, Gavindya, Jayarathna, Sampath, and Wu, Jian (2020). "Analyzing the Effect of Reading Patterns using Eye Tracking Measures". In: *Proceedings of the ACM/IEEE Joint Conference on Digital Libraries in 2020*, pp. 517–518.

Jayawardena, Gavindya, Michalek, Anne, Duchowski, Andrew, and Jayarathna, Sampath (2020). "Pilot study of audiovisual speech-in-noise (sin) performance of young adults with adhd". In: *ACM Symposium on Eye Tracking Research and Applications*, pp. 1–5.

Yasith Jayawardana, Alexander C. Nwala, **Gavindya Jayawardena**, Jian Wu, Sampath Jayarathna, Michael L. Nelson, and C. Lee Giles (2020). "Modeling Updates of Scholarly Webpages Using Archived Data". In: *2020 IEEE International Conference on Big Data (Big Data)*. Atlanta, GA: IEEE, pp. 1868–1877. DOI: 10.1109/BigData50022.2020.9377796.

De Silva, Senuri, Dayarathna, Sanuwani, Ariyarathne, Gangani, Meedeniya, Dulani, Jayarathna, Sampath, Michalek, Anne MP, and **Jayawardena, Gavindya** (2019). "A rule-based system for ADHD identification using eye movement data". In: *2019 Moratuwa Engineering Research Conference (MERCon)*. IEEE, pp. 538–543.

Jayawardena, Gavindya, Michalek, Anne, and Jayarathna, Sampath (2019). "Eye tracking area of interest in the context of working memory capacity tasks". In: *2019 IEEE 20th International Conference on Information Reuse and Integration for Data Science (IRI)*. IEEE, pp. 208–215.

Yasith Jayawardana, Randil Fernando, **Gavindya Jayawardena**, Dileka Weerasooriya, and Indika Perera (2018). "A Full Stack Microservices Framework with Business Modelling". In: *18th International Conference on Advances in ICT for Emerging Regions (ICTer)*. Colombo, Sri Lanka: IEEE, pp. 78–85. DOI: 10.1109/ICTER.2018.8615473.

ARTICLES

- **Effect of Reading Patterns of Novice Researchers using Eye Tracking**
  https://ws-dl.blogspot.com/2020/04/2020-04-25-effect-of-reading-patterns.html
  This article explains how novice researchers' eye movements change during a research papers reading task.

- **Lab Streaming Layer (LSL) Tutorial for Windows**
  https://ws-dl.blogspot.com/2019/07/2019-07-15-lab-streaming-layer-lsl.html
  This article explains how to install open source LSL and stream eye movement data from PupilLabs Core eye tracker to NeuroPype academic edition.

- **Use of Cognitive Memory to Improve the Accessibility of Digital Collections**
  https://ws-dl.blogspot.com/2019/06/2019-06-19-use-of-cognitive-memory-to.html
  This article explains a study conducted to investigate eye gaze metrics collected during Reading SPAN task to differentiate the performance of adults with and without ADHD, and how to generalize that study to improve content accessibility for the people with learning disabilities without overloading their cognitive memory.

- **Real-time Header Extraction from Scientific PDF Documents: Summer Research Internship Experience at Los Alamos National Laboratory**
  https://ws-dl.blogspot.com/2021/09/2021-09-23-real-time-header-extraction.html
  This article explains my 2021 Summer research internship experience at Los Alamos National Laboratory.

- **ACM Symposium on Eye Tracking Research and Applications (ETRA) 2021 Trip Report**
  https://ws-dl.blogspot.com/2021/06/2021-06-xx-acm-symposium-on-eye.html
  This article serves as a virtual trip report for the ACM Symposium on Eye Tracking Research and Applications (ETRA) 2021.

INVITED TALKS

- **Introduction to Data Wrangling**
  Student ThinSat Research Summer Camp (STRS), ODU (2020)

- **Eye-Tracking for Assessing Speech-In-Noise Performance of Adults with ADHD**
  CS395 - Research Methods in Data and Web Science, ODU (2020)

- **Eye Tracking for Predicting ADHD**
  ODU CS Summer Workshop, ODU (2019)