# YASITH JAYAWARDANA


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

+1 (757) 762 8922 | yasith@cs.odu.edu | yasith.dev | @yasithdev


## WORK EXPERIENCE

### Postgraduate Research Fellow @ Center for Advanced Imaging, Harvard University

Feb-Aug 2022 | Cambridge, MA

PyTorch | TensorFlow | Python | NumPy | OpenCV

Developed ML techniques for explainable classification and out-of-distribution (OOD) detection of single-cell bacteria images acquired through Quantitative Phase Microscopy.

### Summer Graduate Research Intern @ Los Alamos National Laboratory

Jun-Aug 2021, 2022 | Los Alamos, NM

PDFIUM | GROBID | RegEx | Robust Links API | Linked Data | Laravel | Python

Built a web app to extract URLs from PDF documents, preserve their content in web archives, generate robust links as HTML <a> tags, and persist them as Linked Data.

### Graduate Research / Teaching Assistant @ Old Dominion University

Jan 2019-Present | Norfolk, VA

TensorFlow | MediaPipe | LabStreamingLayer | JSON-Schema | Python | NumPy

Built a ML pipeline for real-time, multi-user gaze estimation from webcam video feeds • Built ML models to diagnose ASD from EEG and IRT data • Developed a sensory data relay/replay/simulate technique using metadata, to simplify stream analysis workflows.

### Software Developer / Team Lead @ DesignBoo (PVT) Ltd

Jan-Dec 2018 | Colombo, Sri Lanka

Spring | PostgreSQL | Angular | Vue | React Native | Android | OAuth 2.0 | AWS | Docker

Managed **The GP Service (UK) Ltd** dev-teams in UK and Sri Lanka • Set up CI/CD from BitBucket to AWS • Set up SSO using OAuth 2.0 • Developed and maintained mobile apps/web apps/services.

### Software Engineering Intern @ WSO2 Lanka (PVT) Ltd

Jun-Dec 2017 | Colombo, Sri Lanka

Elasticsearch | TensorFlow | DialogFlow | PostgreSQL | Python | Flask

Developed an automated Q&A system (Suzy) for WSO2 support by indexing their HTML docs, training a ML model to answer user queries, and creating an API to invoke it from DialogFlow (chat bot).

## RECENT PROJECTS

### Robust Label-Free Diagnostics @ Harvard University

Feb-Aug 2022 | github.com/yasithdev/qpm-amrb-new

PyTorch | TensorFlow | Python | NumPy | OpenCV

Developed out-of-distribution (OOD) aware deep learning models to identify bacteria species from single-cell images via ResNet and Normalizing Flow backbones. Developed pixel and embedding-level OOD metrics to detect novel inputs, and regularized the models to yield predictive uncertainty estimates.

### StreamingHub @ Old Dominion University

Fall 2019–Present | github.com/nirdslab/streaminghub

WebSocket | Rust | gRPC | LabStreamingLayer | Node-RED | Python | NumPy | Pandas

Created JSON schema for data streams/datasets/analytics and built a framework around them for building stream based scientific workflows. **Devices:** PupilLabs Core, CGX Quick-30, Empatica E4

### MGaze @ Old Dominion University • University of California San Diego

Summer 2020-Present | github.com/nirdslab/facemesh-gaze-tracking

TensorFlow | TF.js | MediaPipe | C++ | Python | OpenCV

Built a ML pipeline for real-time, multi-user gaze estimation from webcam video feeds.

### ASDetection @ Old Dominion University • Indiana University-Purdue University Columbus

Spring 2019 | github.com/nirdslab/asd-detection

TensorFlow | WEKA | Python | NumPy | Pandas | PyWavelets

Performed Spectral Analysis on EEG data, and trained CNN classifiers to diagnose ASD. Extended it using thermal data and got $\geq 90\%$ accuracy.

### Full Stack Microservices Framework for Java @ University of Moratuwa

Jan-Dec 2018 | github.com/msstack

ZooKeeper | Kafka | Curator | Freemarker | Netty | Java | Maven

Created a microservice framework which uses distributed messaging to discover/orchestrate services, and a business process specification to generate boilerplate microservices.

## ABOUT ME

A passionate PhD Student / ML Enthusiast open for internships in Machine Learning, Data Science, DevOps, and Software Development.

## EDUCATION

### Ph.D. (Computer Science)

@ Old Dominion University, Norfolk, VA

2019-2024 (Expected) | GPA: 4.00/4.00

Machine Learning | Information Retrieval | Data Science | DevOps, Containers, & Cloud

### B.Sc (Computer Science & Engineering)

@ University of Moratuwa, Sri Lanka

2014–2018 | GPA: 3.84/4.20

Software Engineering | Applied Statistics | Distributed Systems | Database Internals | Computer Architecture

## ACHIEVEMENTS

- **Grants in Aid of Research (GIAR)** (2020) Sigma Xi
- **Nominated for Best Poster Award** (2020) ACM/IEEE JCDL
- **Best Student Paper Award** (2019) IEEE IRI
- **Dominion Scholar Award** (2019) Old Dominion University
- **Graduated with First Class Honors** (2018) University of Moratuwa
- **Dean's List Award (6 of 8 semesters)** (2014-18) University of Moratuwa

## SKILLS

Java | Spring | Maven | Gradle | Android | React Native | MongoDB | MySQL | PostgreSQL | NodeJS | Angular | React | Vue | Docker | Zookeeper | Kafka | ZeroMQ | LabStreamingLayer | Elasticsearch | Solr | PyTorch | TensorFlow | WEKA | NumPy | Pandas | Python | C/C++ | C# | Unix | AWS

## INTERESTS

Computer Vision | NLP | DSP | Stream Processing | UI/UX Design | DevOps | Distributed Systems

## OUTREACH

- **Volunteer, Old Dominion University**
  *Trick or Research* (2019)
  *Science Connection Day* (2019)
  *STEAM on Spectrum* (2019)
  *Great Computer Challenge* (2019)
- **Peer Reviewer**
  *JCDL* (2022,2021,2020)
  *CHIIR* (2021,2020)
  *IUI* (2021,2020)
  *AH* (2020)

## PUBLICATIONS

Gavindya Jayawardena, **Yasith Jayawardana**, Sampath Jayarathna, Jonas Högström, Thomas Papa, et al. (2022). In: *Procedia Computer Science*. Vol. 207. Elsevier. Chap. Toward a Real-Time Index of Pupillary Activity as an Indicator of Cognitive Load, pp. 1331–1340. DOI: https://doi.org/10.1016/j.procs.2022.09.189.

Bhanuka Mahanama, **Yasith Jayawardana**, Sundararaman Rengarajan, Gavindya Jayawardena, Leanne Chukoskie, et al. (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. **[Featured Article]**.

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

Bhanuka Mahanama, **Yasith Jayawardana**, and Sampath Jayarathna (2020). "Gaze-Net: Appearance-Based Gaze Estimation Using Capsule Networks". In: *Augmented Human International Conference (AH)*. ACM, pp. 1–4. DOI: 10.1145/3396339.3396393.

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

**Yasith Jayawardana** and Sampath Jayarathna (2020). "Streaming Analytics and Workflow Automation for DFS". In: *ACM/IEEE Joint Conference on Digital Libraries (JCDL)*. ACM, pp. 513–514. DOI: 10.1145/3383583.3398589. **[Nominated for Best Poster]**.

Dilantha Haputhanthri, Gunavaran Brihadiswaran, Sahan Gunathilaka, Dulani Meedeniya, **Yasith Jayawardana**, et al. (2019). "An EEG based Channel Optimized Classification Approach for Autism Spectrum Disorder". In: *Moratuwa Engineering Research Conference (MERCon)*. IEEE, pp. 123–128. DOI: 10.1109/MERCon.2019.8818814.

Sampath Jayarathna, **Yasith Jayawardana**, Mark Jaime, and Sashi Thapaliya (2019a). In: *Computational Models for Biomedical Reasoning and Problem Solving*. IGI Global. Chap. Electroencephalogram (EEG) for Delineating Objective Measure of Autism Spectrum Disorder (ASD), pp. 34–65. DOI: 10.4018/978-1-5225-7467-5.ch002. **[Book Chapter]**.

**Yasith Jayawardana**, Mark Jaime, and Sampath Jayarathna (2019). "Analysis of Temporal Relationships between ASD and Brain Activity through EEG and Machine Learning". In: *20th International Conference on Information Reuse and Integration for Data Science (IRI)*. IEEE, pp. 151–158. DOI: 10.1109/IRI.2019.00035. **[Best Student Paper]**.

**Yasith Jayawardana** and Sampath Jayarathna (2019a). "DFS: A Dataset File System for Data Discovering Users". In: *ACM/IEEE Joint Conference on Digital Libraries (JCDL)*. ACM, pp. 355–356. DOI: 10.1109/JCDL.2019.00068.

**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)*. IEEE, pp. 78–85. DOI: 10.1109/ICTER.2018.8615473.

## OPEN-SOURCE CONTRIBUTIONS

- (Package) **CapsNet**
  https://github.com/yasithdev/capsnet
  Python Package for building Capsule Networks in TensorFlow 2
- (Package) **SQLBackup**
  https://github.com/yasithdev/SQLBackup
  NuGet Package for server-side SQL Backup and Restore
- (Framework) **StreamingHub**
  https://github.com/nirdslab/streaminghub
  A visual programming toolkit to build scientific workflows on real-time sensory data streams.
- (PR) **Containerized Deployment of Apache OODT**
  https://github.com/apache/oodt/pulls?q=author:yasithdev
- (PR) **Fix Issues in React Native Library for OpenTok**
  https://github.com/opentok/opentok-react-native/pulls?q=author:yasithdev
- (PR) **Fix Issues in React Native Library for Monitoring Sound Level**
  https://github.com/punarinta/react-native-sound-level/pulls?q=author:yasithdev

## ARTICLES

- **Visual Data Analysis with StreamingHub**
  https://ws-dl.blogspot.com/2020/04/2020-04-16-visual-data-analysis-with.html
  This article explains visual data analysis, and how it can be used in StreamingHub.
- **Time Series Data Analysis - What, Why and How**
  https://ws-dl.blogspot.com/2019/07/2019-07-08-time-series-data-analysis.html
  This article explains how data analysis on time-series data differs from longitudinal data, and how such data could be usefully analyzed.
- **Metadata on Datasets Saves You Time**
  https://ws-dl.blogspot.com/2019/05/2019-05-31-metadata-on-datasets-saves.html
  This article explains the necessity of metadata to improve the reusability of scientific data and the reproducibility of scientific results.
- **A Beginner's Guide to Netty 4 (Part 1)**
  https://medium.com/@yasithdev/a-beginners-guide-to-netty-4-part-1-f3a62b064ced
  This article explains the fundamentals of Netty, and the concepts one should know to start building applications using Netty.

## INVITED TALKS

- **Data Science with EEG**
  *ODU CS Summer Workshop*, ODU (2019)
- **Machine Learning on Data**
  *Student ThinSat Research Summer Camp (STRS)*, ODU (2020)
- **Diagnosing ASD from Brain Activity**
  *CS395 - Research Methods in Data and Web Science*, ODU (2020)