

# Yasith Jayawardana

## Ph.D. Student

E&CS 3110, Department of Computer Science  
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## RESEARCH INTERESTS

Streaming Analytics, Data Science, Deep Learning, Signal Processing

## EDUCATION

- Jan 2019 **Ph.D. in Computer Science** | *Old Dominion University, Norfolk, VA*  
- May 2023 **GPA:** 4.0 | **Advisor:** Dr. Sampath Jayarathna | **Awards:** Dominion Graduate Scholar (2019) | **Key Courses:** Information Retrieval / Human Computer Interaction / Data Science & Analytics / DevOps, Containers & Cloud / Natural Language Processing (Expected)
- Jan 2015 **B.Sc. in Computer Science and Engineering** | *University of Moratuwa, Sri Lanka*  
- Dec 2018 **GPA:** 3.84 | **Awards:** First Class Honors / Dean's List (Semesters 1,2,4,6-8) | **Key Courses:** Data Structures & Algorithms / Computer Architecture / Calculus for System Modeling / Database Systems / Computer Networks / Signals and Systems / Machine Learning / Data Mining & Information Retrieval / Bioinformatics / Distributed Systems

## WORK EXPERIENCE

- Jan 2019 **Old Dominion University, Norfolk, VA** (*Graduate Assistant, Department of Computer Science*)  
- Present Project(s): **XAIBacteria, StreamingHub, MGaze, ASDetection, HACS**
- Jun 2021 **Los Alamos National Laboratory, Los Alamos, NM** (*Summer Graduate Research Intern*)  
- Aug 2021 Project(s): **RobustPDFLinks**
- Jan 2018 **DesignBoo (PVT) Ltd, Sri Lanka** (*Freelance Software Developer / Team Lead*)  
- Dec 2018 Project(s): **TheGPService**
- Jan 2018 **University of Moratuwa, Sri Lanka** (*Teaching Assistant, Computer Science*)  
- Jun 2018 Project(s): **MSStack, DengAI, TourMate, MusicSchool**
- Jun 2017 **WSO2 (PVT) Ltd, Sri Lanka** (*Software Engineering Intern*)  
- Dec 2017 Project(s): **Semantic-KB**

## SKILLS

**Programming Languages:** Python, Java, C/C++, C#, Julia, Node.js, PHP, HTML/JS/CSS  
**Databases:** MySQL, PostgreSQL, MongoDB, SQLite, Redis, DynamoDB  
**AWS:** S3, RDS, EC2, Route 53, CloudWatch, ELB, EKS  
**Frameworks:** TensorFlow, TF.js, PyTorch, OpenCV, Pandas, NumPy, Angular, React, React-Native  
**IDEs:** PyCharm, IntelliJ, Visual Studio, XCode, VSCode  
**Software:** WEKA, NeuroPype, Node-RED, LabStreamingLayer, Orange, Pupil Capture  
**Devices:** PupilLabs Core, Empatica E4, Emotiv Insight, CGX Quick-30  
**Operating Systems:** Windows, Android, MacOS, Ubuntu, iOS  
**Version Control:** Git, SVN  
**Creative Tools:** Adobe Photoshop, Adobe Illustrator, SmartDraw, Draw.io

## PROJECTS

- XAIBacteria (2021-Present)**  
*Python, TensorFlow, SciPy, NumPy*  
Building interpretable deep learning algorithms for culture-free early detection of antibiotic drug resistant bacteria using Computer Vision and Quantitative Phase Microscopy (QPM). Microscopic images of different bacteria strains are used to train Capsule-Network models with a smooth latent space representation.
- StreamingHub (2019-Present)**  
*Node-RED, Python, LibLSL, WebSockets, Node, TF.js, Docker, Kubernetes, HTML/JS/CSS*  
A stream-oriented framework to create scientific workflows through visual programming and flow-based programming. It provides a web interface to create scientific workflows, connect to sensory data streams, pipe sensory data through workflows, and visualize analytics in real-time. A repository of preset workflows is also provided for common use cases. Additionally, it supports re-streaming of stored data into workflows, and generating synthetic data using stored data.
- RobustPDFLinks (2021)**  
*Python, PyPDF2, PyPDFium, GROBID, PDFMiner, Flask, Linked Data, HTML/JS/CSS*  
A web service to generate robust links for web resources. It allows to upload PDF documents, extract URLs from PDF annotations/text, invoke the Robust Links Service on URLs to preserve their content in web archives, and thereby generate robust links. Upon generating robust links, their availability can be announced to external systems via Linked Data Notifications. It also allows to view PDF documents side-by-side with robust links.

4. **MGaze (2020)**  
*MediaPipe, TF.js, Node, Parcel, HTML/JS/CSS*  
Collaborative project for webcam-based, multi-user eye tracking on the browser. It eliminates the need for additional eye-tracking equipment by performing facial detection, facial landmarks detection, iris detection, and gaze estimation through webcam feeds.
5. **ASDetection (2019)**  
*TensorFlow, Python, NumPy, Pandas, PyWavelets*  
Using EEG and Thermography data to predict a diagnosis of ASD. First, features were extracted from pre-processed EEG and thermography data. Here, spatiotemporal features were extracted from EEG data using wavelet transformation. Next, machine learning models were trained on features to predict a diagnosis of ASD.
6. **HACS (2019)**  
*Python, Internet Archive, SciPy, NumPy, Pandas*  
Estimating the rate of change of the academic web using archived copies of web pages. Here, archived copies are first obtained from the Internet Archive through its CDX Server API. Next, for each web page, archived copies are analyzed to detect when changes have occurred. These changes are then modeled as a poisson process and used to predict when a page is likely to change in the future.
7. **TheGPSERVICE (2017)**  
*React Native, AWS, Docker, Docker-Compose, Angular, Spring, PostgreSQL, OpenID, OAuth, BitBucket, HTML/JS/CSS*  
Built a mobile application for making doctor consultations. Re-structured cloud infrastructure on AWS to reduce costs. Set up unified logging using AWS CloudWatch. Created Dockerfiles and BitBucket Pipelines to build, test, and push build artifacts into AWS. Provided development and production support for the web apps of The GP Service (UK) Ltd. Added single-sign-on capability to web portal. Upgraded web portal from Angular 2.x to 4.x.
8. **Containerized Deployment of Apache OODT (2019)**  
*Java, Maven, Docker, Docker-Compose, Avro, Solr, SLF4J, JIRA, Confluence*  
Created Dockerfiles for each core component in Apache OODT. Added a Maven Archetype to auto-generate Dockerfiles and a Docker-Compose file when creating a new Apache OODT project. Issue tracking was handled using JIRA, and documentation was written using Confluence.
9. **MSstack (2018)**  
*Java, Netty, Kafka, Zookeeper, Curator, Git*  
A full-stack, event-driven, microservices framework for Java, with business modeling. It abstracts away the complexities of microservices architecture by providing interfaces to write business logic. The framework internally handles microservice lifecycle, data partitioning, and auto-scaling. It also facilitates generating boilerplate code from Business Process Models.
10. **Semantic-KB (2017)**  
*ElasticSearch, TensorFlow, PostgreSQL, NLTK, Scrapy, Flask, Python, DialogFlow, HTML/JS/CSS*  
Internship project at WSO2 Lanka (PVT) Ltd to automate question answering in WSO2 Support portal. Created a document index using ElasticSearch, a reinforcement learning model using TensorFlow to predict document-query relevance, and a search interface using HTML/JS/CSS.
11. **DengAI (2017)**  
*Python, Scikit-Learn, Pandas, WEKA*  
A competition hosted by DrivenData, to model the spread of Dengue using weather and geographical information. Built a machine learning model that ranked #1 in 2017.
12. **TourMate (2017)**  
*ExpressJS, Node, MongoDB, React, Git, HTML/JS/CSS*  
A web platform aimed at tourists and tour providers. Tourists can discover tour services and make reservations, while tour providers can post and advertise their services.
13. **Raven (2016)**  
*Microsoft Emotion API, C#*  
A real-time customer satisfaction monitoring framework for the hospitality industry. It uses camera feeds to detect customer faces, analyze emotions, provide satisfaction ratings, and alert dissatisfactions in real-time.
14. **Onion (2016)**  
*C#, WPF, MySQL, Dapper ORM, VSTS*  
A Point-of-Sales, Inventory, Reporting, Loan, & Payroll System for Dambulla Economic Centre, Sri Lanka
15. **MusicSchool (2016)**  
*PHP, Laravel, jQuery, MySQL, HTML/JS/CSS*  
A web platform to manage information of a medium sized music school. It supports classroom management, progress tracking, attendance, and payroll.

## PUBLICATIONS

### JOURNALS

1. Bhanuka Mahanama, **Yasith Jayawardana**, Sundararaman Rengarajan, Gavindya Jayawardena, Leanne Chukoskie, Joseph Snider, Sampath Jayarathna, "Eye Movement and Pupil Measures: A Review", In *Frontiers in Computer Science* 3:733531, 2022, Frontiers Media.

## BOOK CHAPTERS

2. Sampath Jayarathna, **Yasith Jayawardana**, Mark Jaime, Sashi Thapaliya, "Electroencephalogram (EEG) for Delineating Objective Measure of Autism Spectrum Disorder", in *Computational Models for Biomedical Reasoning and Problem Solving*, 2019, IGI Global. pp. 34-65.

## CONFERENCES

3. **Yasith Jayawardana**, Gavindya Jayawardana, Andrew T. Duchowski, Sampath Jayarathna, "Metadata-Driven Eye Tracking for Real-Time Applications", in *ACM Symposium on Document Engineering (DocEng)*, 2021, ACM. pp. 1-4.
4. **Yasith Jayawardana**, Alexander C. Nwala, Gavindya Jayawardana, Jian Wu, Sampath Jayarathna, Michael L. Nelson, C. Lee Giles, "Modeling Updates of Scholarly Webpages Using Archived Data", in *IEEE International Conference on Big Data (BigData)*, 2020, IEEE. pp. 1868-1877.
5. Bhanuka Mahanama, **Yasith Jayawardana**, Sampath Jayarathna, "Gaze-Net: Appearance-Based Gaze Estimation using Capsule Networks", in *11th Augmented Human International Conference (AH)*, 2020, ACM. pp. 1-4.
6. **Yasith Jayawardana**, Sampath Jayarathna, "Streaming Analytics and Workflow Automation for DFS", in *20th ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 2020, ACM. pp. 513-514. (Nominated for Best Poster)
7. Dilantha Haputhanthri, Gunavaran Brihadiswaran, Sahan Gunathilaka, Dulani Meedeniya, **Yasith Jayawardana**, Sampath Jayarathna, Mark Jaime, "An EEG based Channel Optimized Classification Approach for Autism Spectrum Disorder", in *5th International Multidisciplinary Engineering Research Conference (MERCon)*, 2019, IEEE. pp. 123-128.
8. **Yasith Jayawardana**, Mark Jaime, Sampath Jayarathna, "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)*, 2019, IEEE. pp. 151-158. (Best Student Paper)
9. **Yasith Jayawardana**, Sampath Jayarathna, "DFS: A Dataset File System for Data Discovering Users", in *ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 2019, ACM. pp. 355-356.
10. **Yasith Jayawardana**, Randil Fernando, Gavindya Jayawardana, Dileka Weerasooriya, Indika Perera, "A Full Stack Microservices Framework with Business Modelling", in *18th International Conference on Advances in ICT for Emerging Regions (ICTer)*, 2018, IEEE. pp. 78-85.

## DOCTORAL CONSORTIUMS (Not in Proceedings)

11. **Yasith Jayawardana**, Sampath Jayarathna, "Towards a Consistent Metadata Format for Data Analysis", in *ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 2020, ACM.

## GRANTS

1. **Sigma Xi Grants in Aid of Research** (2020) | Funding: \$500  
Analytic Streams for Sensory Data: Can Data Analytics be Streamed Alongside Sensory Data and Metadata to Build Efficient Data Pipelines?

## AWARDS, HONORS, & SCHOLARSHIPS

1. **Dominion Graduate Scholar**, Old Dominion University (2019)
2. **First Class Honors**, University of Moratuwa (2018)
3. **Dean's List**, University of Moratuwa (Semesters 1,2,4,6-8)

## TEACHING EXPERIENCE

- Spring 2021 **CS250 – Problem Solving & Programming II**, Old Dominion University  
Teaching Assistant for Dr. El Mesalami
- CS620 – Introduction to Data Science & Analytics**, Old Dominion University  
Teaching Assistant for Dr. Sampath Jayarathna
- Fall 2020 **CS300T – Computers in Society**, Old Dominion University  
Teaching Assistant for Lecturer Rekha Gupta
- Summer 2020 **CS361 – Data Structures & Algorithms**, Old Dominion University  
Teaching Assistant for Dr. Steven Zeil
- CS355 – Principles of Programming Languages**, Old Dominion University  
Teaching Assistant for Dr. Jay Morris
- Spring 2020 **CS361 – Data Structures & Algorithms**, Old Dominion University  
Teaching Assistant for Dr. Zac Howland
- Spring 2018 **CS2963 – Presentation Skills**, University of Moratuwa  
Teaching Assistant for Dr. Rapti De Silva

## SERVICES

### INVITED TALKS

1. **Re-Streaming and Synthesis for Real-Time Analysis**  
Web Science & Digital Libraries (WSDL) Research Group Expo, Old Dominion University, 2021
2. **Machine Learning on Data**  
Student ThinSat Research Summer Camp (STRS), Old Dominion University, 2020
3. **Diagnosing ASD from Brain Activity**  
CS395: Research Methods in Data and Web Science, Old Dominion University, 2020

#### 4. **Data Science with EEG**

CS Summer Research Workshop, Old Dominion University, 2019

#### **PEER REVIEWS**

1. **JCDL** (2021,2020) | ACM/IEEE Joint Conference on Digital Libraries
2. **CHIIR** (2021,2020) | ACM SIGIR Conference on Human Information Interaction and Retrieval
3. **IUI** (2021,2020) | ACM Conference on Intelligent User Interfaces
4. **AH** (2020) | Augmented Human International Conference

#### **VOLUNTEERING**

1. **34th Great Computer Challenge**, Old Dominion University (2019)
2. **Trick or Research**, Old Dominion University (2021,2020,2019)
3. **Science Connection Day**, Old Dominion University (2019)
4. **STEAM on Spectrum**, Virginia Modeling, Analysis, & Simulation Center (2019)

#### **MEMBERSHIPS**

1. **Honor Society of Phi Kappa Phi (PKP)** - Graduate Student Member
2. **Association for Computing Machinery (ACM)** - Student Member
3. **Institute for Electrical and Electronics Engineers (IEEE)** - Student Member
4. **Institution of Engineers, Sri Lanka (IESL)** - Student Member