

J. DINAL HERATH

Full Name: Jerome Dinal Herath Muthukumaranage
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EDUCATION

State University of New York at Binghamton, USA

PhD in Computer Science

August 2018 - Present

GPA: 3.93/4.00

University of Colombo, Sri Lanka

Bachelor of Science, Specialization in Computational Physics.

Winner of Gold Medal for Computational Physics (2017)

January 2013 - January 2017

GPA: 3.66/4.00

Chartered Institute of Marketing, UK

Professional Postgraduate Diploma in Marketing

August 2011 - May 2015

St. Joseph's College, Colombo 10, Sri Lanka

Primary Education, GCE Ordinary Levels, GCE Advanced Levels

Assistant Head Prefect (2011-2012)

August 2011

RESEARCH EXPERIENCE

State University of New York at Binghamton, USA

Research done in fulfillment of PhD

August 2018 - Present

- Built a real-time machine learning model designed for anomaly detection in a streaming multivariate time-series [BIGDATA'19]
- Utilizing Blockchain technology to improve the safety and reproducibility of scientific research [CIC'19]

State University of New York at Binghamton, USA

Graduate Research Assistant

August 2017 - August 2018

- Built a Markovian model to understand the use of opportunistic routing in cached wireless networks (applicable for Internet of Things) [ICC'18, TVT'19]
- Designed a Deep Learning model for wireless signal strength prediction [ICC'19, TVT'20]

University of Colombo, Sri Lanka

Research done in fulfillment of Bachelors Degree

January 2016 - January 2017

- Simulated the movement of a snake robot using Gazebo, an open source robot simulator and experimented the effect of different robotic designs and movement patterns [ICIAfS'17, ICCMS'18]

TEACHING EXPERIENCE

State University of New York at Binghamton, USA

Graduate Teaching Assistant, Department of Computer Science

August 2018 - Present

- CS 571 : Programming Languages in Spring-2020
- CS 480N/580N : Data Science with Applications in Social Media in Fall-2019
- CS 220 : Introduction to Computer Systems in Spring-2019
- CS 428/528 : Computer Networks in Fall-2018

University of Colombo, Sri Lanka

Assistant Lecturer, Department of Physics

January 2017 - August 2017

- Teaching experience in Masters of Physics Education Lab

- Teaching Assistant Lecturer for Undergraduate courses in Computational Physics and Physics
- Teaching experience in Undergraduate Lab sessions (Electronics and Computing Lab 2, General Physics Lab 1)

TECHNICAL STRENGTHS

Modelling Skills	Markovian and Mathematical Modelling, Machine Learning, Deep Learning, Reinforcement Learning
Programming Languages	Python, Java, C, Matlab, Pytorch, Tensorflow

SELECTED RESEARCH PROJECTS

RAMP (Real-Time Aggregated Matrix Profile) [BIGDATA'19]

- Real-Time Aggregated Matrix Profile (RAMP) is a machine learning model that is capable of identifying anomalies given a stream of multivariate time series data in real time.
- A semi-supervised model that has online training and provides insight into root causes of anomalies.
- Shows superior anomaly detection capability for both direct and adversarial attacks when experimented on scientific workflows running on Amazon EC2 Virtual Machines.

SciBlock (Blockchain for Scientific Workflows) [CIC'19]

- A Blockchain based tamper proof storage system designed to protect scientific data and provenance from being forged or altered in a distributed collaborative environment.
- This system provides primitives allowing fast querying of provenance data efficiently and the capability to invalidate wrong/outdated provenance data without altering the Blockchain.

DeepChannel (Deep Learning for wireless signal quality prediction) [ICC'19, TVT'20]

- DeepChannel is an encoder-decoder based sequence-to-sequence deep learning model that is capable of predicting future wireless signal strength variations based on past signal strength data.
- It can be applied to scheduling and improved video streaming over 4G LTE networks and bit rate adaptation for improved performance in WiFi networks.

PUBLICATIONS

1. “*RAMP: Real-Time Anomaly Detection in Scientific Workflows*”. By **J. Dinal Herath**, Changxin Bai, Guanhua Yan, Ping Yang, Shiyong Lu. In: IEEE International Conference on Big Data (Big Data-2019).
2. “*SciBlock: A Blockchain-Based Tamper-Proof Non-Repudiable Storage for Scientific Workflow Provenance*”. By Dinuni Fernando, Siddharth Kulshrestha, **J. Dinal Herath**, Nitin Mahadik, Yanzhe Ma, Changxin Bai, Ping Yang, Guanhua Yan, Shiyong Lu. In: International Conference on Collaboration and Internet Computing (CIC-2019)
3. “*DeepChannel: Wireless Channel Quality Prediction using Deep Learning*”. By Adita Kulkarni, Anand Seetharam, Arti Ramesh, **J. Dinal Herath**. In: IEEE Transactions in Vehicular Technology (TVT-2019).
4. “*A Deep Learning Model for Wireless Channel Quality Prediction*”. By **J. Dinal Herath**, Anand Seetharam, Arti Ramesh. In: IEEE International Conference on Communications (ICC-2019).
5. “*A Markovian Model for Analyzing Opportunistic Request Routing in Wireless Cache Networks*”. By **J. Dinal Herath** and Anand Seetharam. In: IEEE Transactions in Vehicular Technology (TVT-2018).

6. “*Analyzing Opportunistic Request Routing in Wireless Cache Networks*”. By **J. Dinal Herath** and Anand Seetharam. In: IEEE International Conference on Communications (ICC-2018).
7. “*Simulation of Symmetric and Asymmetric movement gaits for Lateral Undulation in Serial Snake Robots*”. By **J. Dinal Herath** and K. Jayananda. In: 2017 International Conference on Computational Modeling Simulation (ICCMS-2017).
8. “*Comparison of Serial and Parallel Snake Robots for Lateral Undulation Motion Using Gazebo*”. By **J. Dinal Herath** and K. Jayananda. In: 2016 IEEE International Conference on Information and Automation for Sustainability (ICIAfS- 2016).

AWARDS AND SCHOLARSHIPS

1. NSF funded student travel grant to attend IEEE International Conference on Collaboration and Internet Computing (CIC-2019).
2. Selected amongst the top 5000 candidates as a Secure and Private AI scholarship Challenge Recipient by Udacity and Facebook (2019).
3. Student travel grant to attend ACM/IEEE Symposium on Architectures for Networking and Communications (ANCS-2018).
4. NSF funded student travel grant to attend IEEE International Conference on Communications (ICC-2018).
5. Winner of Dr. Sarath Gunapala Gold Medal for Computational Physics, University of Colombo, Sri Lanka (2017).
6. Recipient of MIND (Munasinghe Institute for Development) Scholarship, Sri Lanka (2015-2016).