

SAMURDHI KARUNARATNE

Curriculum Vitae

📍 Los Angeles, California

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Electrical and Computer Eng. M.S./Ph.D. candidate at UCLA with a strong background in various machine learning techniques (esp. reinforcement learning), wireless optimization research (3 years) and algorithmic programming (5 years). Hands-on experience in web development and mobile app development.

EDUCATION

- || **University of California, Los Angeles** 2019 September-present
M.S./Ph.D. in Electrical and Computer Engineering
Current GPA: 3.90/4.00
- || **University of Peradeniya, Sri Lanka** 2015-2019
B.Sc. in Computer Engineering
GPA: 4.00/4.00 (top of the class)
- || **Dharmaraja College, Sri Lanka** 2011-2013
G.C.E. Advanced Level (Mathematics, Physics and Chemistry)
Ranked in the **Top 20** overall in the country

RESEARCH EXPERIENCE

- || **Cognitive Reconfigurable Embedded Systems Lab (CORES), UCLA** Sept. 2019 - present
Graduate researcher Supervisor: Danijela Cabric
 - Studying deep learning techniques to differentiate unauthorized radio transmitters from a set of known transmitters
 - Developing deep learning techniques to single-out deliberate jamming interference from uncooperative civilian wireless infrastructure in military settings, and using Monte Carlo Tree Search techniques to predict ideal courses of action to avoid jammers.
- || **Department of Computer Engineering, University of Peradeniya** May 2018 - February 2019
Undergraduate research project Supervisor: Asitha Bandaranayake
 - Produced a framework for context-aware optimization of wireless networks with respect to throughput-sensitive and delay-sensitive users using knowledge-based Q-learning techniques
- || **Nokia Bell Labs, Belgium** November 2017 - April 2018
Research intern Supervisor: Haris Gacanin
 - Produced original algorithms for detecting oscillation effects in routing, and joint channel and location optimization in Wireless Mesh Networks based on knowledge-enhanced Q-learning.
 - Hands-on experience in developing simulations for testing multi-AP Wi-Fi networks using ns-3.
 - Studied different artificial intelligence techniques applied on wireless networks with respect to solving both functional design problems (eg. routing, channel allocation) and network management problems (eg. anomaly detection).

PUBLICATIONS

Deep Learning Approaches for Open Set Wireless Transmitter Authorization

Hanna S., Karunaratne, S. and Cabric, D.

IEEE SPAWC 2020 May 2020

An Overview of Machine Learning Applications in Wireless Mesh Networks

Karunaratne, S. and Gacanin, H.

IEEE Communications Magazine April 2019

Artificial Intelligence Driven Optimization of Channel and Location in Wireless Networks

Karunaratne, S., Atawia, R., Perenda, E. and Gacanin, H.

2018 IEEE GLOBECOM Workshops Dec. 2018

Self-optimization of Wireless Systems with Knowledge Management: An Artificial Intelligence Approach

Gacanin, H., Perenda, E., Karunaratne, S. and Atawia, R.

IEEE Transactions on Vehicular Technology Oct. 2019

PATENTS (PENDING)

Optimizing a Wireless Network that Comprises Range Extenders

Karunaratne, S. and Gacanin, H.

EPO App. Number: **EP20181741372**

Optimizing a Wi-Fi Network Comprising Multiple Range Extenders and Associated Devices

Karunaratne, S. and Gacanin, H.

EPO App. Number: **EP20181834755**

SELECTED HONORS & AWARDS

UCLA Electrical and Computer Engineering Departmental Fellowship

2019

University of California, Los Angeles

Silver medal at the 45th International Physics Olympiad (IPhO)

2014

First (and currently, only) Sri Lankan student to place in the top 50 (and top 100) *Astana, Kazakhstan*

Silver medal at the 15th Asian Physics Olympiad (APhO)

2014

First (and currently, only) Sri Lankan student to win a silver medal (or better) *Singapore*

Industrial and Financial Systems (IFS) Gold Medal for the Best Performance in Computer Engineering

2019

Awarded at the General Convocation

University of Peradeniya, Sri Lanka

Bartholomeusz Prize for Engineering Mathematics (two times)

2015, 2016

Awarded annually for first and second year students

University of Peradeniya, Sri Lanka

Gold Medal and Winner of the Sri Lankan Physics Olympiad

2013

Recorded a perfect score

Institute of Physics, Sri Lanka

Invited to study physics at the National University of Singapore (NUS)

2014

In recognition of performance at APhO 2014

National University of Singapore

All Sri Lanka Rank 20 at the G.C.E Advanced Level Examination in Physical Science Stream

2013

Out of 27768 students, nationwide entrance exam for state engineering universities

1st Country Rank at IEEEExtreme 10.0, 62nd Globally (with Team biteCode)

2016

Worldwide competitive programming contest

IEEE

High Distinction Award at the Sri Lankan Mathematics Competition

2011

Sri Lanka Olympiad Mathematics Foundation

Champions at ACES Coders v6.0 (with Team biteCode) Sri Lanka's biggest competitive programming competition	2016 <i>University of Peradeniya, Sri Lanka</i>
Mahapola Higher Education Merit Scholarship	<i>Government of Sri Lanka</i> 2013
Sri Lanka Insurance Life Suba Pathum Scholarship In recognition of excellence at 2013 G.C.E. A/L Examination	2014 <i>Sri Lanka Insurance Corporation Ltd.</i>
Prize for the Highest GPA among Male Students Awarded annually to first-year students	2015 <i>University of Peradeniya, Sri Lanka</i>
Gold medal for the Best All-Round Student Highest school honor, awarded to one student per each batch	2013 <i>Dharmaraja College, Kandy</i>

PROJECTS

- SimSwatch** 2017
Embedded systems project
 - An ultra low cost smartwatch which works with Android/iOS
- Acceleration of Face Detection using GPGPUs** 2016
Using CUDA, OpenCV
 - Developing a parallelized real-time face detection algorithm that runs on CUDA enabled GPGPUs
- Toolshed (previously ToolsEd)** 2016
Database systems project
 - Online learning platform based on collaborative learning.
- SiRA – Simple Reply Automation** 2015
Won award for Best Software at ACES Hackathon 2016 and Finalist at Yarl Geek Hackathon 2016
 - Android app with capabilities for smart automated text replies.

COMPUTER SKILLS

Programming Languages	C++ Java C Python MATLAB Shell Bash
Programming Languages	C# Haskell
Web	HTML CSS JavaScript JQuery PHP MySQL
Mobile Programming	Android
Version Control	Git Mercurial
Graphics / Video	Photoshop After Effects CoreIDRAW Illustrator
Hardware-oriented Programming	Arduino Verilog HDL
Documents / Type Setting	Microsoft Office L ^A T _E X

ACADEMIC SERVICE

Peer-Review **IEEE Internet of Things Journal**

LANGUAGES

English Sinhala^(native) Tamil
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EXTRA-CURRICULAR

Awarded Best English Orator

Dharmaraja College, Kandy, 2011

Athletics **National Semi-finalist (100m), Central Provincial Finalist (100m, 200m), Kandy**
Under 14 div. **District Finalist (100m, 200m), Awarded Best Track Athlete (Dharmaraja College,**
(100m, 200m) **2008)**

Captain of the Under 13-B Cricket Team

Dharmaraja College, Kandy, 2007

REFERENCES

|| **Prof. Danijela Cabric** Elect. and Comp. Eng. Dept., UCLA ✉ danijela@ee.ucla.edu

|| **Prof. Roshan Ragel** Comp. Eng. Dept., Univ. of Peradeniya, Sri Lanka ✉ roshanr@pdn.ac.lk