

## RAJSIMMAN RAVICHANDIRAN

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### PROFILE STATEMENT

Self-motivated Masters graduate with strong research and technical acumen in Cloud computing, Software-Defined Networking and Cybersecurity; industry experience in building and deploying software solutions in production environments

### EDUCATION

**Master of Applied Science**, University of Toronto (U of T) 2016-2018  
Major in Electrical Engineering  
Thesis: *Autonomic Management System in SAVI-IoT*

**Bachelor of Applied Science**, U of T 2009-2014  
Major in Electrical Engineering with 1 year Professional Year Experience (PEY)

- Final year GPA: 3.51, Dean's List

### TECHNICAL SKILLS

- **Programming:** Python, C/C++, Shell Scripting, SQL, HTML, JavaScript
- **Operating Systems:** Linux (Ubuntu, RedHat, Kali) and Windows
- **Applications:** Docker, Elasticsearch, Kibana, Kafka, Cassandra, OpenStack, Splunk
- **Tools:** Git, Burp Suite, Fail2ban, OSSEC, WireShark, MATLAB

### RELEVANT ENGINEERING EXPERIENCE

**Master of Applied Science Thesis Research**, U of T Sept. 2016 - Dec. 2018

- Designed Autonomic Management System (AMS) to manage both compute resources and network bandwidth for Internet of Things (IoT) applications
- Developed autoscaling modules for microservices and virtual machines (VMs) using Docker
- Utilized Software-Defined Networking (SDN) mechanisms to govern network bandwidth for applications to maintain expected quality of service
- Investigated Economic Denial of Sustainability (EDoS) mitigation techniques to secure AMS
- Implemented Neurocomputing-based anomaly detection models to thwart EDoS attacks
- Created crowd monitoring IoT application (using WiFi data) and evaluated AMS performance

**Network Analyst**, Bell Canada Jan. 2015 - Sept. 2016

- Developed full-stack application to manage virtual resources on cloud platform
- Created web application for operations teams to troubleshoot network outage issues
- Implemented software for analytics teams to query customer data usage information
- Built automated scripts to analyze network data for monitoring and management
- Produced customer intelligence reports to provide interesting insights on Bell's technologies

**Research Assistant**, Smart Applications on Virtual Infrastructure (SAVI) May - Dec. 2014

- Actively worked on national distributed application testbed that provides platform for creating and delivering future internet applications and network architectures
- Extended the capabilities of the monitoring and measurement services (Ceilometer) of OpenStack open-source cloud computing software on SAVI Testbed

- Implemented communication drivers between Kafka messaging broker and Cassandra database utilized by resource management system on Testbed
- Installed software and hardware servers for cloud infrastructure management
- Created email notification functionalities for Ceilometer alarm service
- Developed automated scripts to measure the query speed between Ceilometer API and database

## **PROJECTS**

**Team Lead**, User Behaviour Analysis using OSSEC on Cloud, U of T Dec. 2016

- Analyzed user behaviours on VMs for OSSEC Host-based Intrusion Detection System (HIDS)
- Profiled users based on input shell commands on the environment
- Utilized Naive Bayes supervised machine learning model to accurately classify multiple users
- Trained learning model using open-source UNIX public dataset
- Achieved 69% accuracy without any hyper-parameter tuning or advanced training
- Implemented prototype on SAVI Testbed
- Released source code for open-source community use

**Team Lead**, Video streaming on the Edge, SAVI Design Challenge, U of T Aug. 2014

- In a team of 4, created an application that connects video content publishers on SAVI Testbed to subscribers interested in streaming the content
- Utilized Twitter social platform to communicate between the publisher and subscriber
- Incorporated stream processing to filter real-time tweets and find both parties
- Built application on SAVI Testbed in 3 days, **won Design Challenge**

## **PUBLICATIONS**

**Rajsimman Ravichandiran**, Hadi Bannazadeh, Alberto Leon-Garcia, eDoS Mitigation for Autonomic Management on Multi-Tier IoT, *14th International Conference on Network and Service Management (CNSM 2018)*, Nov. 2018

**Rajsimman Ravichandiran**, Hadi Bannazadeh, Alberto Leon-Garcia, Anomaly Detection using Resource Behaviour Analysis for Autoscaling systems, *2018 IEEE Conference on Network Softwarization (NetSoft 2018)*, June 2018

Hamzeh Khazaei, **Rajsimman Ravichandiran**, Byungchul Park, Hadi Bannazadeh, Ali Tizghadam, Alberto Leon-Garcia, Elascare: autoscaling and monitoring as a service, *27th Annual International Conference on Computer Science and Software Engineering (CASCON 2017)*, Nov. 2017

Jieyu Lin, **Rajsimman Ravichandiran**, Hadi Bannazadeh, Alberto Leon-Garcia, Monitoring and Measurement in Software-Defined Infrastructure, *Integrated Network Management (IM 2015) IFIP/IEEE International Symposium*, May 2015

## **INTERESTS**

Playing chess and organized team sports including Flag-Football and Basketball; learning and building simple Raspberry Pi projects; film (including documentaries)

**References Available Upon Request**