RAJSIMMAN RAVICHANDIRAN

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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, Shell Scripting, C/C++, SQL, HTML, CSS, JavaScript
- **Operating Systems**: Linux (RedHat, Ubuntu, Kali) and Windows
- **Applications**: OpenStack, Docker, Elasticsearch, Kibana, Beats, Django, Tornado
- **Tools**: Git, OSSEC, Fail2Ban, Splunk, MATLAB, WireShark

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 resources for multi-tier Internet of Things (IoT) applications
- Developed autoscaling modules for microservices and virtual machines (VMs) using Docker
- Utilized Software-Defined Networking (SDN) to self-govern network bandwidth for applications to maintain expected quality of service
- Investigated economic denial of sustainability (eDoS) mitigation techniques to secure AMS
- Deployed Neurocomputing-based anomaly detection models to prevent eDoS attacks
- Created IoT application to monitor crowd movements using WiFi information collected passively by Onion IoT devices
- Evaluated AMS on research cloud platform using crowd monitoring application
- Released AMS source code for open-source community use: https://github.com/RajsimmanRavi/Elascale_secure

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

- Created web portal to provision virtual machines on Bell Toronto-IP-and-Innovation-Centre (TIPIC) Lab Cloud Infrastructure
- Implemented open-source Linux framework to provision Point-to-Point over Ethernet (PPPoE) sessions from Cloud platform to main routing offices over Bell's wide area network
- Developed application to create PPPoE sessions on-demand for Network Support Team to troubleshoot issues
- Designed software for Network Operations Team to correlate Bell Customer identity and network information
- Built automated scripts to parse and aggregate Simple Network Management Protocol (SNMP) data (generated by routers) for network troubleshooting purposes
- Produced Customer Intelligence Reports to provide interesting insights on Bell's Wireline Internet technologies using data analytics tools such as Splunk and Deepfield

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
- Focused on extending the capabilities of the monitoring and measurement services (Ceilometer) of OpenStack open-source cloud computing platform on SAVI Testbed
- Implemented communication drivers between Kafka messaging broker and Cassandra database used by monitoring architecture for resource management on Testbed
- Installed software and hardware servers for cloud infrastructure management
- Created Email notifications service for Ceilometer alarm service
- Developed automated scripts to measure the query speed of 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: https://github.com/RajsimmanRavi/UBA_OSSEC

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 cloud platform 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, Elascale: 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

References Available Upon Request