BINH NGUYEN

luminbinh@gmail.com, +1 (801) 673 3129, https://www.linkedin.com/in/binh-nguyen-8860aa53

SUMMARY

Deep understanding of mobile data service architecture (4G LTE), mobile network components (eNodeB, MME, SGW, PGW, HSS), and low-level mobile protocols. Experienced in design and implement scalable systems in mobile network anomaly detection, IoT, cloud-based EPC core, Software-Defined networking, and network automation. Familiar with Agile Software development, DevOps, and microservices.

WORK EXPERIENCE

Spectrum - Advanced Engineering — Principal Engineer, 1/2018-now

- Research new technologies in scalable Software-Defined Networking (SDN) platforms and network automation.
- Design and implement a pre-post management check system using big data analytics.
- Design and implement a network fault management service using SNMP.
- Mentor junior engineers and interns.

Microsoft Research — Research Intern, 05-08/2016

- Propose and implement a distributed architecture (ECHO) that enhances scalability and availability of NFV-based LTE/EPC mobile networks running in an unreliable infrastructure (like public clouds).
- Evaluate ECHO in Microsoft Azure. ECHO achieves more than five 9s availability with only 10% of overhead.

Nokia Bell Labs — Research Intern, 05-08/2015

- Propose a light-weight SDN/NFV-based mobile edge cloud architecture (SIMECA) for a massive number of IoT devices.
- Implement and evaluate SIMECA using Software defined radio eNodeB, Open vSwitch (in C), Ryu SDN controller (in Python). SIMECA reduces up to 30% of network overhead for IoT devices. Repeatable profile is available at https://tinyurl.com/yagke8qy.

AT&T Labs Research — Research Intern, 05-08/2014

- Designed and built a monitoring system (ABSENCE) that detects failures that are not detected by existing monitoring systems (i.e., silent failures) in a large scale operational mobile network using data analytics, anomaly detection algorithm, Hadoop Map-Reduce, and Call Detail Record (CDR).
- Deploy ABSENCE in a Hadoop cluster with 200 nodes in a major mobile operator. ABSENCE was able to detect silent failures in real time.

Flux Research Group University of Utah — Research Assistant, 01/2013-12/2017

- Help deliver or extend functionalities in PhantomNet (http://www.phantomnet.org/).
- Study how LTE protocols affect TCP performance using NS3 network simulator.
- Propose and implement a network offloading architecture using Ryu SDN Controller and Open vSwitch.
- Extend Segment Routing IPv6 support for Open vSwitch and Ryu SDN controller. Combine Segment Routing with OSPF (Free Range Routing) and SDN to realize traffic engineering in core networks.

University of Utah — Teaching Assistant, 08/2012 - 12/2012

- Course: Computer Architecture (CS3810).

TECHNICAL SKILLS

LTE network	LTE stack (eNodeB and EPC core), Software Defined Radio.
Data analytics	Hadoop, Pig, ELK stack, Kafka, Avro.
Infrastructure tools	Kubernetes, Docker containers, CI/CD.
Computer Languages	Python, C, Bash, Go.
Software-defined network (SDN)	Ryu controller, Open Daylight, Open vSwitch, ONOS.
Network tools	NS3, Mininet, Emulab, PhantomNet, Free Range Routing.
Network protocols	TCP, OSPF, Segment Routing, SNMP.
Others	Protobuf, YANG, Microsoft Azure.

EDUCATION

University of Utah, PhD in Computer Science 08/2012 - 12/2017
Ph.D. dissertation: "Enhancing scalability and reliablility in mobile core networks".
Shanghai Jiao Tong University, BS in Computer Engineering 08/2008 - 05/2012

PATENTS

Telecommunications network with data centre deployment. US, 15406348. 7/19/2018.

Programmable system architecture for routing data packets in virtual base stations. US, 15068953, 9/14/2017.

AWARDS

NSF travel grant for Mobicom 2015, Paris, France.

Scholarship to studying aboard for excellent students granted by Vietnam Ministry of Education in 2007.

Excellent undergraduate student scholarship by Shanghai Municipal Government in 2009 & 2010 & 2011.

1st Prize High School Physics competition (region level) in 2005 & 2006.

PUBLICATIONS

- ECHO: A reliable distributed mobile core network for public clouds. Mobicom 2018.
- SIMECA: SDN-based IoT Mobile Edge Cloud Architecture. IEEE IM, 2017 (Demo at AT&T Research Academic Summit, 2016).
- ABSENCE: Usage-based Failure Detection in Mobile Networks. Mobicom, 2015.
- PhantomNet: Research Infrastructure for Mobile Networking, Cloud Computing and Software-Defined Networking. ACM GetMobile, 2015. (Won **Best Demo award**, Mobicom, 2016).
- Efficient, Adaptive and Scalable Device Activation for M2M Communications. IEEE SECON 2015.
- Towards Understanding TCP Performance on LTE/EPC Mobile Networks. AllthingsCellular, 2014.
- SMORE: Software-Defined Networking Mobile Offloading Architecture. AllthingsCellular, 2014.

LANGUAGES

Proficient English, Chinese, and Vietnamese (native). Both speaking and writing.

COMMUNITY INVOLVEMENT

Reviewer for 2014 IEEE/ACM Transactions On Networking (ToN).

Volunteer for 2017 ACM Mobicom conference, Snowbird, UT.