Introducing new course:

CSC 7991 - Special Topic: Network Programmability and Applications

Logistics:
o When: TR 4:00pm – 5:15pm
o Where: Synchronous
o Instructor: Dr. Rhongho Jang
o Intended audience: MS/PhD students

What this course is about:
Since Barefoot (acquired by Intel in June 2019) launched the world's first end-user programmable Ethernet switch/router, a new revolutionary value was unlocked from the network, which encouraged industries and researchers to apply advanced technologies using its P4-programmable routers (https://www.intel.com/content/www/us/en/products/network-io/programmable-ethernet-switch.html). However, the programmability and flexibility are offered under a strict condition that should not compromise the routing performance. As a result, proposed data structures and applications are required to be extremely efficient in terms of memory consumption and computation.

This class is a graduate course covering the foundations and advanced topics in network programmability. By the end of the course, students are expected to know 1) the fundamental knowledge of network programmability, 2) router architecture and working flow, 3) state-of-the-art applications, and 4) opportunities and challenges.

Prerequisites. Knowledge on basic concepts of computer networks, including IPv4/IPv6, protocols, routing, access control list (ACL), and quality of service (QoS).

About the Instructor:
Rhongho Jang is an assistant professor in the department of computer science at Wayne State University. He received his Ph.D. in the department of computer science at the University of Central Florida, in 2020. To date, he published as a lead author several peer-reviewed research papers, including papers in top-tier conferences and premier journals, such as IEEE INFOCOM, IEEE ICDCS, IEEE TMC, etc. His research interests lie in security & privacy, network measurement, SDN, counting algorithm, and applied machine learning.

Expected topics:
- Introduction – the need for network programmability
- Network Topology and Traffic Characteristics
- Router/Switch Architecture
- Programming Protocol-Independent Packet Processors
- P4 Programming Language
- Cost-efficient Data Structure and Algorithms
- State-of-the-art Applications (intrusion detection, load balancing, distributed computing, buffer management, etc.)