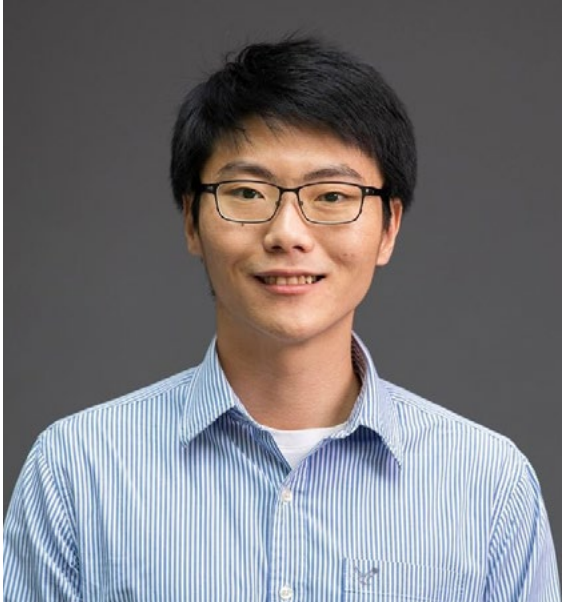## DISSERTATION DEFENSE

HYUN JONG LEE

Improving Application Connectivity with Network-conscious Systems

Tuesday, May 31, 2022
1:00 – 3:00pm
Virtual

ABSTRACT: Application connectivity is ubiquitous and essential: sharing an opinion on social media, live video-streaming a historic moment, warning a driver about hazardous road conditions, etc. Unfortunately, application connectivity suffers from turbulent network environments, because existing underlying systems are largely oblivious to network turbulence, resulting in poor application performance and degraded user experiences.

This dissertation presents basic building blocks toward building network-conscious software systems to improve application connectivity. It demonstrates how applications suffer from turbulent networking environments through series of measurement studies. Based on lessons learned in the studies, it introduces three systems. The first is a system employing redundancy in high-mobility environments to hedge against uncertainty in future connectivity performance. The second is a practical migra- tion system that co-locates computation closer to end-devices. The third is a system that allows application developers to inject lightweight scripts in-network to perform application-aware adaptations closer to the source of turbulence. Collectively, these observations and systems show the value of network-conscious scheduling, migration, and adaptation.

CHAIR: Prof. Brian Noble