Joint CQSE & NCTS Seminar

2025
May 23, Friday

Time: May 23, 14:30 ~ 15:30
Title: Qsyn: A Developer-Friendly Quantum Circuit Synthesis Framework for NISQ Era and Beyond
Speaker: Prof. Chung-Yang Huang (Department of Electrical Engineering, National Taiwan University)
Place: NCTS Physics Lecture Hall, 4F, Chee-Chun Leung Cosmology Hall, NTU
Online Link:
https://nationaltaiwanuniversity-zbh.my.webex.com/nationaltaiwanuniversity-zbh.my/j.php?MTID=m2a963d31adcf732fcddcf95022ff7210

Abstract:

In this talk, we introduce a new quantum circuit synthesis (QCS) framework, Qsyn, for developers to research, develop, test, experiment, and then contribute their QCS algorithms and tools to the framework. Our framework is more developer-friendly than other modern QCS frameworks in three aspects: (1) We design a rich command-line interface so that developers can easily design various testing scenarios and flexibly conduct experiments on their algorithms. (2) We offer detailed access to many data representations on different abstract levels of quantum circuits so that developers can optimize their algorithms to the extreme. (3) We define a rigid developing flow and environment so that developers can ensure their development qualities with the best modern software engineering practices. We illustrate the friendliness of our framework with a showcase of developing a T-Count Optimization algorithm and demonstrate our performance superiority with fair comparisons to other modern QCS frameworks.

Biography:

Prof. Chung-Yang (Ric) Huang received his B.S. from National Taiwan University and his Ph.D. from the University of California, Santa Barbara. Before joining NTU as a faculty member in 2004, he was the third employee at Verplex Systems, a pioneering formal verification startup. Verplex developed Conformal, a tool that now holds approximately 60% of the global market share before being acquired by Cadence.

Prof. Huang is a distinguished scholar in both research and teaching. He set a record at NTU by receiving the Outstanding Teaching Award twice within his first eight years—the shortest possible time for a new faculty member. He was granted tenure in 2011 and has since become a leading researcher in formal verification, serving as a consultant for Cadence and chairing the IEEE CEDA Taipei Chapter. His mentorship has also led students to win the most ACM CADathlon contest awards to date.

Beyond academia, Prof. Huang has extensive entrepreneurial experience. He played a key role in establishing NTU's Creativity and Entrepreneurship Program, NTU Garage, Entrepreneurs Association, NTU Angel Club, and Entrepreneur Center. In 2015, he stepped away from these responsibilities to found Yoctol Info Inc., further demonstrating his passion for innovation and technology commercialization.