College of Engineering and Computing
Department of Electrical and Computer Engineering
Fall 2021 ECE Distinguished Seminar Series

GEORGE MASON UNIVERSITY

Design Automation and Software Tools for Quantum Computing

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Abstract

Quantum computers have the potential to solve certain tasks that would take millenia to complete even with the fastest (conventional) supercomputer. Numerous quantum computing applications with a near-term perspective (e.g., for finance, chemistry, machine learning, optimization) and with a long-term perspective (i.e., cryptography, database search) are currently investigated. However, while impressive accomplishments can be observed in the physical realization of quantum computers, the development of automated methods and software tools that provide assistance in the design and realization of applications for those devices is at risk of not being able to keep up with this development anymore. This may lead to a situation where we might have powerful quantum computers but hardly any proper means to actually use them.

In this talk, we discuss how design automation can help to address this problem. This also includes an overview of corresponding software tools for quantum computers covering the simulation, compilation, and verification.

Brief Bio-Sketch

Robert Wille is Full Professor at the Johannes Kepler University Linz, Austria, and Chief Scientific Officer at the Software Competence Center Hagenberg, Austria. He received the Diploma and Dr.-Ing. degrees in Computer Science from the University of Bremen, Germany, in 2006 and 2009, respectively. Since then, he worked at the University of Bremen, the German Research Center for Artificial Intelligence (DFKI), the University of Applied Science of Bremen, the University of Potsdam, and the Technical University Dresden. Since 2015, he is working in Linz/Hagenberg.

His research interests are in the design of circuits and systems for both conventional and emerging technologies. In these areas, he published more than 350 papers and served in editorial boards as well as program committees of numerous journals/conferences such as TCAD, ASP-DAC, DAC, DATE, and ICCAD. For his research, he was awarded, e.g., with an ERC Consolidator Grant, Best Paper Awards, e.g., at TCAD and ICCAD, a DAC Under-40 Innovator Award, a Google Research Award, and more.

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Zoom Meeting Link:
https://gmu.zoom.us/j/95972538754
Meeting ID: 959 7253 8754