

## informatik-Kolloquium

Der Fachbereich Informatik der Johannes Kepler Universität Linz<sup>1</sup> lädt in Zusammenarbeit mit der Österreichischen Gesellschaft für Informatik (ÖGI) zu folgendem Vortrag ein:

**Topic: The Coming of Age of Microfluidics: EDA Solutions for Enabling Biochemistry on a Chip**

**Presenter: Prof. Tsung-Yi Ho**  
Department of Computer Science, National Tsing Hua University, Taiwan

**Date: Monday, July 11<sup>th</sup> 2016, 10:00**

**Location: Johannes Kepler University Linz  
Computer Science Building (Science Park 3), S3 058**

**Abstract:** This talk offers attendees an opportunity to bridge the semiconductor ICs/system industry with the biomedical and pharmaceutical industries. This talk will first describe emerging applications in biology and biochemistry that can benefit from advances in electronic “biochips”. The presenter will next describe technology platforms for accomplishing “biochemistry on a chip”, and introduce the audience to both the droplet-based “digital” microfluidics based on electrowetting actuation and flow-based “continuous” microfluidics based on microvalve technology. Next, the presenter will describe system-level synthesis includes operation scheduling and resource binding algorithms, and physical-level synthesis includes placement and routing optimizations. In this way, the audience will see how a “biochip compiler” can translate protocol descriptions provided by an end user (e.g., a chemist or a nurse at a doctor’s clinic) to a set of optimized and executable fluidic instructions that will run on the underlying microfluidic platform. The problem of mapping a small number of chip pins to a large number of array electrodes will also be covered. Finally, sensor feedback-based cyberphysical adaptation will be covered.

**Short Bio:** Tsung-Yi Ho received his Ph.D. in Electrical Engineering from National Taiwan University in 2005. He is a Professor with the Department of Computer Science of National Tsing Hua University, Hsinchu, Taiwan. His research interests include design automation and test for microfluidic biochips and nanometer integrated circuits. He has been the recipient of the Invitational Fellowship of the Japan Society for the Promotion of Science (JSPS), the Humboldt Research Fellowship by the Alexander von Humboldt Foundation, and the Hans Fischer Fellow by the Institute of Advanced Study of the Technical University of Munich. He was a recipient of the Best Paper Awards at the VLSI Test Symposium (VTS) in 2013 and IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems in 2015. He served as a Distinguished Visitor of the IEEE Computer Society for 2013-2015, the Chair of the IEEE Computer Society Tainan Chapter for 2013-2015, and the Chair of the ACM SIGDA Taiwan Chapter for 2014-2015. Currently he serves as an ACM Distinguished Speaker, a Distinguished Lecturer of the IEEE CAS Society, and Associate Editor of the ACM Journal on Emerging Technologies in Computing Systems, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, and IEEE Transactions on Very Large Scale Integration Systems, Guest Editor of IEEE Design & Test of Computers, and the Technical Program Committees of major conferences, including DAC, ICCAD, DATE, ASP-DAC, ISPD, ICCD, etc.

*Einladender: Univ.-Prof. Dr. Robert Wille  
Institut für Integrierte Schaltungen  
Abteilung Integrierter Schaltungs- und Systementwurf*

<sup>1</sup> Der Fachbereich (<http://informatik.jku.at>) besteht aus folgenden Instituten:  
Application Oriented Knowledge Processing (FAW), Bioinformatics, Computational Perception, Computer Architecture, Applied Systems Research and Statistics, Computer Graphics, Formal Models and Verification, Networks and Security, Integrated Circuits, Pervasive Computing, Software Systems Engineering, System Software, Telecooperation, Signal Processing