

# 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: **Advancing the use of Microfluidic Biochips by Electronic Design Automation**

Presenter: **Prof. Dr.-Ing. Ulf Schlichtmann**, Technical University of Munich (TUM), Germany

Datum: **Monday, January 28<sup>th</sup> 2019, 13:00**

Location: **JKU, Science Park 1, room MT 128**

## **Abstract:**

Microfluidic biochips provide a convenient and cost-effective way to conduct biochemical, biological, or medical experiments. Instead of conducting tests manually in a fully equipped lab using expensive lab equipment and human resources, these devices allow to conduct biochemical and medical experiments on a small chip. This approach requires much smaller sample/reagent volumes and leads to a significantly higher throughput.

However, designing the corresponding chips has become a considerably complex task. Depending on the respective platform thousands – or even tens of thousands – of components and features have to be put together.

Several methods and solutions for design automation of microfluidic devices have been proposed in the past years. They provide a starting point for introducing and exploiting EDA methods in the microfluidic domain. I will introduce EDA research for microfluidic biochips and give an overview of our recent work in this area. Specifically, I will discuss using channels also for storage, techniques for improving reliability and a concept to utilize a flexible, valve-based array. I will also introduce Columba, our specification-to-layout synthesis tool for microfluidics.

## **Short Bio:**

Ulf Schlichtmann holds a doctorate in electrical engineering from TUM, as well as a technology business degree. He spent about 10 years in the semiconductor industry (Siemens, Infineon) in various engineering, management and executive positions, working on design automation, design libraries, IP reuse, and product development.

In 2003, he joined TUM as professor and head of the Chair of Electronic Design Automation. From 2007-2013 he served as Dean and Vice Dean of TUM's Department of Electrical and Computer Engineering (ECE). Since 2013, he serves as Associate Dean of Studies for International Programs, overseeing both the Department's educational programs in Singapore and English language programs in Munich. He is also Program Director of TUM's research center in Singapore, TUMCREATE. Since 2016, Ulf is an elected member of TUM's Academic Senate as well as the TUM Board of Trustees. In addition, he serves on a number of advisory board of both research institutes and companies.

Ulf's current research interests include computer-aided design of electronic circuits and systems, with an emphasis on designing reliable and robust systems. His research increasingly addresses emerging technologies, such as microfluidic biochips and photonic interconnects.

*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