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Technische Informatik

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### 3<sup>rd</sup> Colloquium of the Field of Expertise "Information, Communication & Computing"

Dear all,

we kindly invite you to participate in the third Colloquium of the Field of Expertise "Information, Communication & Computing".

When: 14.00 on May 31, 2017

Where: HS F (NT03), Kopernikusgasse 24, 3rd floor

[https://online.tugraz.at/tug\\_online/wbraum.editRaum?&pRaumNr=568](https://online.tugraz.at/tug_online/wbraum.editRaum?&pRaumNr=568)

Please register for participation at the latest by May 24 by sending email to Nora Zakany <[nora.zakany@tugraz.at](mailto:nora.zakany@tugraz.at)> so that we can plan for catering.

Please do also forward this invitation to your scientific staff / PhD students.

Program:

1) Invited Lecture by Prof. Kim G Larsen, Aalborg University

Learning, Synthesis and Verification for Cyber-Physical Systems

#### **ABSTRACT:**

Cyber-Physical Systems (CPS) describe systems combining computing elements with dedicated hardware and software having to monitor and control a particular physical environment. This combination of the physical and virtual world provides the digital foundation for smart solutions throughout society and within all sectors. The constant demand for increased functionality and performance that needs to be produced with tight time schedules and cost budgets challenges without compromising dependability of the final products constitutes a significant challenge.

What is needed are improved, scalable methods, tools and techniques that support the development of CPS.

The talk will be based on the model-based approach for the design of dependable and optimal CPS, supported by the model checking tool UPPAAL ([www.uppaal.org](http://www.uppaal.org)). In the talk we will present and discuss the most recent branches UPPAAL Stratego that offer a highly disruptive design methodology for CPS: UPPAAL Stratego allows for fully automatic generation of safe and optimal control software directly from requirement. UPPAAL Stratego is based on a unique combination of symbolic techniques with reinforcement learning methods, as well as abstraction techniques. The talk will report on the application to a number of industrial CPS examples including synthesis of safe and optimal adaptive cruise control, synthesis of energy-optimal floor-heating systems, and synthesis of safe and optimal traffic controllers.

BIO: I am a professor in the Department of Computer Science at Aalborg University within the Distributed and Embedded Systems Unit and director of the ICT-competence center CISS, Center for Embedded Software Systems. In 2015 I won an ERC Advanced Grant with the project LASSO for learning, analysis, synthesis and optimization of cyber physical systems. I am also director of the Sino-Danish Basic Research Center IDEA4CPS, the Danish Innovation Network InfinIT, as well as the newly founded innovation research center DiCyPS: Data Intensive Cyber Physical Systems. I am currently a visiting professor with the TU Graz LEAD project "Dependable Internet of Things".

2) Short presentations by the winners of the "Competitive Initial Funding Program" (Anschubfinanzierung) about their projects.

3) Drinks, Snacks, Networking.

Kind regards,  
Prof. Oswin Aichholzer, Prof. Mihyun Kang, and Prof. Kay Römer.