

- 报告题目** 设计前沿研讨会:
Cyber-Physical Systems:
Concepts, Technologies And Implementation Principles(1,2)
- 报告人** Prof. Dr. Imre Horváth
Faculty of Industrial Design Engineering
Delft University of Technology
the Netherlands
i.horvath@tudelft.nl
- 报告时间** 9.00am-12.00am, 1st-2nd July 2014
- 报告地点** 精密仪器系系馆四楼会议室 4304
- 主办单位** 机械系设计所



简介 This invited presentation concentrates on the most important definitions, concepts, technologies and implementation principles of cyber-physical systems. The objective of the research done by the speaker has been to cast light on the key notions, prevailing theoretical understanding, and engineering concepts, and to investigate the main principles and resources of implementation. As the research shows, practical implementations of cyber-physical systems may appear in many different forms. Cyber-physical systems may manifest in the form of both low-end and high-end systems. However, they can be identified based on their distinctive characteristics such as distributed, multi-scaled, dynamic, smart, cooperative and adaptive, and the levels of these characteristics. In the presentation, a novel view is offered which opens up new opportunities for further exploitation of this rapidly proliferating system paradigm. First, a proposal is made to replace the standard architectural reasoning model that reflects the functional relationships among analogue and digital hardware, control and application software, and informational cyberware. Then, the presentation discusses the most important design and implementation principles. As a consequence of the current re-interpretation of the features of this computational paradigm, many scientists see these systems as socially embedded and socially behaving complex adaptive systems. Therefore, the ‘traditional’ definition of cyber-physical systems has been strongly challenged. The presentation explains what the dimensions of socialization of cyber-physical systems are and what new interfacing issues are associated with their real life application. The final conclusion is that, though a huge number of publications are available concerning the paradigm, constituents, architectures and enabling technologies of cyber-physical systems, this domain of knowing and development is still in its infancy and many research questions should be addressed from multiple aspects.

Bio:

Prof. Dr. Imre Horváth earned M.Sc. titles in mechanical engineering and engineering education at the Technical University of Budapest. I was working for the Hungarian Shipyards and Crane Factory for more than six years. With additional studies, Prof. Dr. Imre Horváth specialized in computer aided design and engineering. After the industry years, Prof. Dr. Imre Horváth has had various faculty positions at the Technical University of Budapest, and earned

doctoral titles, including that from the Hungarian Academy of Sciences. Prof. Dr. Imre Horváth's research has focused on issues concerning geometric and structural modeling, knowledge-intensive software tools, advanced design support of conceptual design, and virtual reality technologies and applications.

Prof. Dr. Imre Horváth has published more than 30 journal articles and more than 150 conference papers, has received 4 best paper awards (e.g., from ASME, ICED). He is serving 3 journals as permanent editor and many more in guest editor position. He initiated the International Symposia on Tools and Methods of Competitive Engineering (TMCE) and has been its general chairman for 12 years. He has served the Executive Committee of the CIE Division of the American Society of Mechanical Engineers for 7 years, also as Chair of Division. He presented several invited and keynote talks at international conferences.

As educator Prof. Dr. Imre Horváth is interested in advanced support of product design, in particular that of conceptual design, integrating research into design education, and teleconferencing-based active learning.

清华大学重点学科高水平国际合作创新团队支持项目

Contact: Hou Yuemin, Tel: 62773470

email: hym01@mails.tsinghua.edu.cn