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Seminar

Advanced Design Theories and Technology for  
Complex Systems (1)

1. Natural User Interface Design

June 28, 2012

2. Case Studies of NUI Design of Complex Systems

June 29, 2012

3. Conceptualizing and Testing Smart Products and Systems on  
Matlab/Simulink.

July 3, 2012



**Lecturer**

Dr. Zoltán Rusák Delft University of Technology

**Sponsor**

International Collaboration Innovation Team Project of Tsinghua University  
(重点学科高水平国际合作创新团队支持项目)

**Organizer**

Institute of Design Engineering

Tsinghua University

<http://adcp2012.com>

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## Contact

Dr. Zoltan Rusak

Delft University of Technology

Landbergstraat 15, Delft, 2628CE, The Netherlands

FAX: +31-15-278-1839

E-mail: Z.Rusak@tudelft.nl

Dr. Hou Yuemin

Institute of Design Engineering, Precision Instruments and Mechanology Department

Tsinghua University

Beijing 100084, China

Tel: 8610-62773470

hym01 at mails.tsinghua.edu.cn



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## Introduction to the lecturer



**Dr. Zoltán Rusák**

**Delft University of Technology**

Assistant Professor

Industrial Design Engineering, Delft University of Technology

Zoltán Rusák is an assistant professor at the Section of Computer Aided Design Engineering at the Faculty of Industrial Design Engineering, Delft University of Technology, The Netherlands. He obtained his master degree in the field of mechanical engineering from the Budapest University of Technology and Economics in 1998. He earned his PhD in Computer Aided Design Engineering from the Delft University of Technology in 2003. His research interest includes computer support of geometric modeling, use process simulation in virtual reality environments, and mobile, portable and ubiquitous computing for design applications. He is the general secretary of the Tools and Methods of Competitive Engineering biannual symposia. He is the PhD mentor of the Faculty of Industrial Design Engineering.

### Selected Publications

Horvath, I & Rusak, Z (2001). Collaborative shape conceptualization in virtual design environments. *Communications of the ACM* (<http://www.acm.org/cacm/1201/1201>, 44(12), 59-63. (TUD)

Rusak, Z (2004). Computational issues of a VDIM based multipurpose modeling in conceptual design. *Journal of Computing and Information Science in Engineering*, 4(2), 140-149. (TUD)

Rusak, Z & Horvath, I (2005). Instantiation of shapes for products by shape formation rules based on the vague discrete interval model. *Journal of Engineering Design*, 16(2), 135-155. (TUD)

Rusak, Z, Antonya, C & Horvath, I (2011). Methodology for controlling contact forces in interactive grasping simulation. *The International Journal of Virtual Reality*, 10(2), 1-10. (TUD)

Antonya, C & Rusak, Z (2011). Path generation in virtual reality environment based on gaze analysis. In s.n. (Ed.), *Proceedings of the IEEE Africon 2011- Theme: Sustainable Energy &*

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*Communications Development for Africa* (pp. 1-4). Piscataway: IEEE. (TUD)

**Poelman, R, Rusak, Z, Verbraeck, A** & Alcubilla, L.S. (2010). The effect of visual feedback on learnability and usability of design methods. *Strojinski Vestnik (Journal of Mechanical Engineering)*, 56(11), 744-753. (TUD)

**Rusak, Z** (2003, September 9). *Vague discrete interval modeling for product conceptualization in collaborative virtual design environments*. Delft University of Technology (159 pag.) Prom./coprom.: **Prof.dr. I Horvath & Dr. JSM Vergeest**. (TUD)

Rusák,Z, Cimen, I., Horváth, I., van der Helm, A. (2012) “Designing natural user interfaces for commercial 3D modelling software”, TMCE 2012 Symposium, pp. 441-454.

Broek, JJ, Horvath, I, Smit, A de, Lennings, AF, Rusak, Z & Vergeest, JSM (2002). Free-form thick layer object manufacturing technology for large-sized physical models. *Automation in construction*, 11(3), 335-347. (TUD)

Horvath, I, Vergeest, J S M, Broek, J J, Rusak, Z & de Smit B (1998). Tool profile and tool path calculation for free-form thick-layered fabrication. *Computer-Aided Design*, 30(14), 1097-1110.



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## Seminar

### **Advanced Design Theories and Technology for Complex Systems (1)**

Lecturer: Dr. Zoltán Rusák,  
Faculty of Industrial Design Engineering, Delft University of Technology

#### Venue

Meeting room 4304, Precision Instrument & Mechanology Department,  
Tsinghua University

#### Lecture 1: **Natural User Interface Design.**

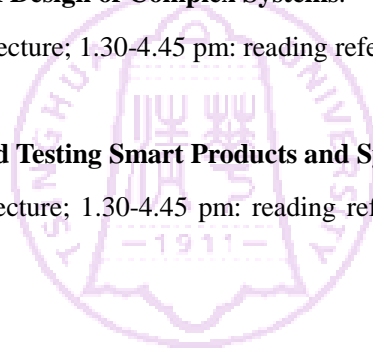
June 28, 2012, 8.30-11.45 am: lecture; 1.30-4.45 pm: reading reference materials and discussion

#### Lecture 2: **Case Studies of NUI Design of Complex Systems.**

June 29, 2012, 8.30-11.45 am: lecture; 1.30-4.45 pm: reading reference materials and discussion

#### Lecture 3: **Conceptualizing and Testing Smart Products and Systems on Matlab/Simulink**

July 3, 2012, 8.30-11.45 am: lecture; 1.30-4.45 pm: reading reference materials and discussion,  
tutorial is available



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## References

### Lecture 1:

Horváth, I., Opiyo, E. Z., 2007, "Qualitative Analysis of the Affordances of Three-Dimensional Imaging Systems with a View to Conceptual Shape Design", Proc. of ASME IDETC/CIE Conference, September 4-7 2007, Las Vegas, NV, USA, Paper No. DETC2007-34395.

Andrea Valli, "Notes on Natural Interaction"

Horváth, I., Rusák, Z., De Smit, B., Kooijman, A., & Opiyo, E. Z. (2009). From virtual reality to tangible virtuality: An inventory of the technological challenges. Paper presented at the Proceedings of the ASME/AFM World Conference on Innovative Virtual Reality 2009, WINVR2009, 45-57.

### Lecture 2:

Zoltán Rusák, Ismail Cimen, Imre Horváth, Aadjan van der Helm "Designing natural user interfaces for commercial 3D modelling software", TMCE 2012 Symposium, pp. 441-454.

Poelman, R., Akman, O., Lukosch, S., & Jonker, P. (2012). As if being there: Mediated reality for crime scene investigation. Paper presented at the Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW, 1267-1276.

Thomas Zwart, Zoltan Rusak, Stephan Lukosch, (2012): design of a gesture controlled graphic interface for Head Mounted Displays for CSI the Hague

Zoltán Rusák, Csaba Antonya and Imre Horváth, "Methodology for Controlling Contact Forces in Interactive Grasping Simulation", International Journal of Virtual Reality, 2011, Vol. 9, No. 2, pp 1-10.

### Lecture 3:

Bart Gerritsen, Imre Horváth "THE UPCOMING AND PROLIFERATION OF UBIQUITOUS TECHNOLOGIES IN PRODUCTS AND PROCESSES", Proceedings of the TMCE 2010 Symposium, April 12-16, 2010, Ancona, Italy, ed. by I. Horváth, F. Mandorli and Z. Rusák, pp. 1-16

Imre Horváth, Zoltán Rusák, Wilfred van der Vegte, Eliab Z. Opiyo, Adrie Kooijman, "DEMONSTRATION AND ASSESSMENT OF INNOVATION: ABSTRACT PROTOTYPING OF ARTIFACT AND SERVICE COMBINATIONS", IDETC/CIE 2011, August 29-31, 2011, Washington, DC, USA, Paper No.: IDETC 2011/DTM-47079, pp. 1-12.

Herman Van der Auweraer "VIRTUAL ENGINEERING AT WORK: THE CHALLENGES FOR DESIGNING INTELLIGENT PRODUCTS" Proceedings of TMCE 2010 Symposium, April 12-16, 2010, Ancona, Italy, ed. by I. Horváth, F.Mandorli and Z. Rusák, pp. 3-18

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