Title
Requirements Meet Interaction Design

Instructor
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Short bio-sketch
Hermann Kaindl joined the Vienna University of Technology in Vienna, Austria, in early 2003 as a full professor. Prior to moving to academia, he was a senior consultant with the program and systems engineering division of Siemens Austria. He is a *Senior Member* of the IEEE, a *Distinguished Scientist* member of the ACM, *Fellow* of the IARIA and a member of the AAAI and the INCOSE, and is on the executive board of the Austrian Society for Artificial Intelligence..

Previous tutorial experience
Previously, I held tutorials at CAiSE'00, RE'01, RE'02, HICSS-36, INCOSE'03, RE'03, CADUI-IUI'04, INCOSE'04, RE'04, HICSS-38, IRMA'05, INCOSE'05, AAAI'06, HCI'06, OOPSLA'06, HICSS-40, ICONS'07, INCOSE'07, AAAI'07, IFIP Interact'07, OOPSLA'07, HICSS-41, ICCGI'08, RE'08, ICSEA'08, ICIW '09, Interact'09, SMC'09, HICSS-43, ACHI'10, EICS'10, ICSEA'10, TdSE'10, HICSS-44, SAC'11, INCOSE'11, AAAI'11, RE'11, HICSS-45, SAC'12, ACM CHI'12, PROFES'12, BCS HCI'12 and APSEC'12..

Topics
When the requirements and the interaction design of a system are separated, they will most likely not fit together, and the resulting system will be less than optimal. Even if all the real needs are covered in the requirements and also implemented, errors may be induced by human-computer interaction through a bad interaction design and its resulting user interface. Such a system may even not be used at all. Alternatively, a great user interface of a system with features that are not required will not be very useful as well.

So, the main topics of this tutorial are *requirements* and (communicative) *interaction design*, as well as their joint modeling through discourse models and ontologies. Our discourse models are derived from results of human communication theories, cognitive science and sociology (even without employing speech or natural language). While these models were originally devised for capturing interaction design, it turned out that they can be also viewed as specifying classes of scenarios, i.e., use cases. In this sense, they can also be utilized for specifying requirements. Ontologies are used to define domain models and the domains of discourse for the interactions with software systems. User interfaces for these software systems can be generated semi-automatically from our discourse models, domain-of-discourse models and specifications of the requirements. This is especially useful when user interfaces for different devices are needed. So, requirements meet interaction design to make applications both more *useful* and *usable*.

Prerequisite knowledge
The assumed attendee background is primarily some interest in requirements engineering or user interfaces. There are no prerequisites such as knowledge about any of the results of Human Communication theories, Cognitive Science, Sociology or HCI in general.

Related publications of the proposer

Bogdan, C., Kaindl, H., Falb, J., and Popp, R., Modeling of interaction design by end users through discourse modeling. In *Proceedings of the 2008 ACM International Conference on Intelligent User Interfaces (IUI'08)*. Maspalomas, Gran Canaria, Spain, 2008. ACM Press.

Falb, J., Kaindl, H., Horacek, H., Bogdan, C., Popp, R., and Arnautovic, E., A discourse model for interaction design based on theories of human communication. In *CHI'06 Extended Abstracts on Human Factors in Computing Systems*, New York, NY, USA, 2006. ACM Press, pages 754–759.

Falb, J., Kavaldjian, S., Popp, R., Raneburger, D., Arnautovic, E., and Kaindl, H., Fully Automatic User Interface Generation from Discourse Models. In *Proceedings of the 2009 ACM International Conference on Intelligent User Interfaces (IUI'09)*. Sanibel Island, Florida, USA, 2009. ACM Press . Tool demo paper.

Falb, J., Popp, R., Röck, T., Jelinek, H., Arnautovic, E., and Kaindl, H., Using communicative acts in interaction design specifications for automated synthesis of user interfaces. In *Proceedings of the 21st IEEE/ACM International Conference on Automated Software Engineering (ASE'06)*, Tokyo, Japan, 2006. ACM Press.

Falb, J., Popp, R., Röck, T., Jelinek, H., Arnautovic, E., and Kaindl, H., UI Prototyping for Multiple Devices Through Specifying Interaction Design. In: *Human-Computer Interaction — INTERACT 2007, Proceedings of the 11th IFIP TC 13 International Conference, Part I, LNCS 4662*, Springer, 2007, pp. 136–149.

Kaindl, H., A Practical Approach to Combining Requirements Definition and Object-Oriented Analysis, *Annals of Software Engineering*, Vol. 3, 1997, pp. 319-343.

Kaindl, H., Difficulties in the transition from OO analysis to design, *IEEE Software*, Sept./Oct. 1999, 94–102.

Kaindl, H., A Design Process Based on a Model Combining Scenarios with Goals and Functions, *IEEE Transactions on Systems, Man, and Cybernetics (SMC)* Part A 30(5), 2000, pp. 537–551.

Kaindl, H., Is object-oriented requirements engineering of interest?, *Requirements Engineering*, vol. 10, 2005, pp. 81–84.

Kaindl, H., A Scenario-Based Approach for Requirements Engineering: Experience in a Telecommunication Software Development Project, *Systems Engineering*, vol. 8, 2005, pp. 197–210.

Kaindl, H., Combining Requirements and Interaction Design through Usage Scenarios. In: *Human-Computer Interaction — INTERACT 2009, Proceedings of the 12th IFIP TC 13 International Conference, Part II, LNCS 5727*, Springer, 2009, pp. 932–933.

Kaindl, H., Constantine, L., Pastor, O., Sutcliffe and A., Zowghi, D. (2008) How to Combine Requirements Engineering and Interaction Design?, *Proceedings of the 16th IEEE International Requirements Engineering Conference (RE 2008)*, pp. 299–301.

Kaindl, H., Popp, R., and Raneburger, D., Automated Generation of User Interfaces: Based on Use Case or Interaction Design Specifications? In *Proceedings of the 7th International Conference on Software Paradigm Trends (ICSOFT'12)*. Rome, Italy, 2012.

Kaindl, H., and Svetinovic, D., On confusion between requirements and their representations, *Requirements Engineering*, 2010, Springer.

Mukasa, K., Kaindl, H., An Integration of Requirements and User Interface Specifications, In *Proceedings of the 16th IEEE International Requirements Engineering Conference (RE 2008)*, 2008, pp. 327–328.

Popp, R., Falb, J., Arnautovic, E., Kaindl, H., Kavaldjian, S., Ertl, D., and Horacek, H., Automatic Generation of the Behavior of a User Interface from a High-level Discourse Model. In *Proceedings of*

the 41nd Annual Hawaii International Conference on System Sciences (HICSS-42), Big Island, HI, USA, 2008, IEEE Computer Society Press.