

ACHI 2010 – Tutorial Proposal

Title

Model a Discourse and Transform it to Your User Interface

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 division of program and systems engineering at Siemens Austria. There he has gained more than 24 years of industrial experience. He is a *Senior Member* of the IEEE, a *Distinguished Scientist* member of the ACM, a *Fellow* of IARIA and a member of 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, IFIP Interact'09 and SMC'09.

At several of these conferences, I gave a tutorial on Scenario-based Design of User Interfaces. I propose now a more difficult topic. Instead of employing relatively straight-forward usage scenarios, I propose to present the use of discourse modeling for human-computer interaction. The primary benefit from the added structure and content is that user interfaces can be automatically generated by machine.

A related tutorial to the one proposed here was already given at AAAI-07, HICSS-41 ICCGI'08, but I have not yet shown the automatic generation of user interfaces there. At ICIW-09, I demonstrated it for the first time, and at SMC-09, I additionally let them model themselves.

Description

Every Web application needs a user interface, today even several ones adapted for different devices (PCs, PDAs, mobile phones). Developing a user interface is difficult and expensive, since it normally requires design and implementation. This is also expensive, and even more so for several user interfaces for different devices.

This tutorial shows how human-computer interaction can be based on discourse modeling, even without employing speech or natural language. Our discourse models are derived from results of Human Communication theories, Cognitive Science and Sociology. Such discourse models can specify an interaction design. This tutorial also demonstrates how such an interaction design can be used for automatic generation of user interfaces and linking them to the application logic and the domain of discourse (much like in a recently accepted tool demo at IUI'09).

Prerequisite knowledge

The assumed attendee background is primarily some interest in designing interactions and user interfaces, especially for Web applications. 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., Falb, J., Kaindl, H., Kavaldjian, S., Popp, R., Horacek, H., Arnautovic, E., and Szep, A., Generating an Abstract User Interface from a Discourse Model Inspired by Human Communication. In *Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS-41)*, Big Island, HI, USA, 2007, IEEE Computer Society Press.

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)*, ACM. 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 high-level specifications of user interfaces for their automated synthesis. In *Proceedings of the 20th IEEE/ACM International Conference on Automated Software Engineering (ASE'05)*, New York, NY, USA, 2005. ACM Press, pp 429–430. 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.

J. Falb, R. Popp, T. Röck, H. Jelinek, E. Arnautovic, H. Kaindl, 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.

Falb, J., Popp, R., Röck, T., Jelinek, H., Arnautovic, E., and Kaindl, H., Fully-automatic generation of user interfaces for multiple devices from a high-level model based on communicative acts. In *Proceedings of the 40th Annual Hawaii International Conference on System Sciences (HICSS-40)*, Big Island, HI, USA, 2007, IEEE Computer Society Press.

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., and Jezek, R., From Usage Scenarios to User Interface Elements in a Few Steps, in *Proc. 4th International Conference on Computer-Aided Design of User Interfaces (CADUI'02)*, Valenciennes, France, May 2002.

Kaindl, H., Kramer, S., and Hailing, M., An Interactive Guide Through a Defined Modelling Process, in *People and Computers XV, Joint Proc. of HCI 2001 and IHM 2001*, Lille, France, September 2001. Springer, London, England, pp. 107–124.

Kavaldjian, S., Bogdan, C., Falb, J., and Kaindl, H., Transforming Discourse Models to Structural User Interface Models, *Models in Software Engineering, MoDELS 2007 Workshops*, LNCS 5002, Springer-Verlag, Berlin-Heidelberg (selected from *MDDAUI'07 Workshop papers*), 2008, pp. 77–88.