

# Design Patterns for User Interfaces on Mobile Equipment

Erik G. Nilsson

SINTEF ICT, Postboks 124, Blindern, N-0314 Oslo, Norway, [egn@sintef.no](mailto:egn@sintef.no)

**Abstract.** The objective of this tutorial is to enhance the participants' skills in designing user interfaces for mobile equipment, including adaptive and context sensitive user interfaces and multimodal interaction. Through a combination of lectures and practical exercises, a collection of patterns addressing issues regarding designing user interfaces on mobile devices is presented. The patterns address typical challenges and opportunities when designing user interfaces that are to run on PDAs and SmartPhones – both challenges connected to characteristics of the equipment and connected to tasks to which designing suitable user interfaces is challenging. The tutorial is intended for user interface designer, systems developers, and project leaders that work with or plan to work on development of applications on mobile devices. The tutorial requires basic knowledge of user interface design in general, and basic understanding of challenges connected to designing user interfaces on mobile devices.

## 1 Description of tutorial

The objective of the tutorial “Design patterns for user interfaces on mobile equipment” is to enhance the participants' skills in designing user interfaces for mobile equipment, including adaptive and context sensitive user interfaces and multimodal interaction.

The tutorial presents a collection of patterns [1] addressing issues regarding designing user interfaces on mobile devices that we have developed in two research projects conducted in the period 2004-2009 in cooperation with a number of partners developing application and development tools for mobile applications.. The patterns address typical challenges and opportunities when designing user interfaces that are to run on PDAs and SmartPhones – both challenges connected to characteristics of the equipment and connected to tasks to which designing suitable user interfaces is challenging. The patterns in the collection are structured in three main groups:

1. Utilizing screen space
2. Interaction mechanisms
3. Design at large.

The suggested solutions are based on existing design practice, and the description includes examples of good solution and pros and cons of different approaches.

The tutorial contains a mix of presentations and exercises. The exercises are performed in small groups using paper prototyping. The tutorial is intended for user interface designer, systems developers, and project leaders that work with or plan to work on development of applications on mobile devices. The tutorial requires basic knowledge of user interface design in general, and basic understanding of challenges connected to designing user interfaces on mobile devices.

The participants at the tutorial will learn about design challenges and opportunities that are specific and important when designing user interfaces on mobile devices. They will obtain general knowledge about approaches for overcoming the challenges and exploiting the opportunities, in addition to specific knowledge about solving the most important problems.

Participation in the tutorial will be beneficial for the Interact audience because it both gives a structured overview of the challenges and opportunities connected to user interface design on mobile devices, and gives practical solutions to the most important challenges, including adaptive and context sensitive user interfaces and multimodal interaction.

Tutorial documentation includes a comprehensive research report documenting the patterns collection, in addition to important choices regarding platforms, user interface style and deployment strategies, overview of main differences between mobile and stationary user interfaces, and important issues from platform style guides. Furthermore, the tutorial documentation includes an extensive bibliography. When solving the exercises, the participants will also be using an online patterns collection for user interfaces on mobile devices developed by the presenter in cooperation with colleagues at SINTEF ICT.

The tutorial will be presented by **Erik G. Nilsson**, a Senior Research Scientist at SINTEF ICT. He has been working with model-driven systems development at SINTEF since 1984, with a focus on user interface development the last fifteen years. The last eight year he has performed research on user interface development for mobile equipment, with a focus on adaptation and exploiting context information. He has been and is the project leader for two Norwegian research projects (UMBRA and FLAMINCO) that develop design patterns and evaluation methods for user interfaces on mobile equipment. The patterns and methods are developed in co-operation with Norwegian development and consulting companies focusing on mobile technology. Nilsson has authored/co-authored publications at international refereed journals and conferences on re-engineering, systems integration, user interface design, mobile user interface design and model-based user interface development. He has also been instructor at a large number of courses on user interface design and development for Norwegian companies and organizations, and given presentation on numerous industry oriented seminars.

## References

1. Nilsson EG. Design patterns for user interface for mobile applications. Adv Eng Softw (2009) (in press)