Model-Driven Development of Self-Adaptive Applications for Mobile Devices

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Motivation

• Computing is going mobile, ubiquitous, service oriented
• Mobile use means dynamic variation in user needs and available computing and communication resources
• Applications must adapt to such changes in order to sustain availability, usability and usefulness
Madam Objectives

• Provide support for the development of applications that adapt dynamically to changes in context (at launch time and during use)
Approach

- Application reference architecture

- Notation extensions (UML profile)
- Modeling tool

- Transformation tool (MOFscript, based on EMF)

- Middleware
  - context monitoring
  - context reasoning
  - adaptation reasoning & decision making
  - (re)configuration
  - application launch and initial adaptation

[Diagram showing the relationship between Design Models, MADAM middleware, application components, and mobile users with context information such as noise, position, needs, and battery]
Properties and utility

- Properties
  - Dynamically changing env.
- Execution env
- Application
- Mobile user
- Utility
  - Provides service to
  - Influences
  - Describes
  - Offers
  - Needs
- Execution in

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Conceptual model
Results

• Developed UML profile specialising and extending UML composite structures
• Plugged it into UML modelling tool supporting profiling
• Developing transformation tool based on MOF-script
• Will be used for pilot application development in Madam
Thank you!

Questions?

More information:
www.ist-madam.org