Theses & Praktika
@
DSG/Infosys
Vienna University of Technology
Research Topics

- **Service-Oriented Architecture**
  - Service-Based Systems, Web Services
  - Business Process Management

- **World Wide Web & Internet Computing**

- **Online Data Processing**
  - Event-Based, Distributed Query Processing; Internet-Scale Databases; Sensor Networks

- **Middleware for Distributed Computing**
  - Scalable, Elastic, Robust Architectures

- **Cloud Computing**
  - Virtualization, Platform-as-a-Service, Software-as-a-Service, Elastic Computing

- **Software Engineering for Distributed Systems**
  - Software Testing, Design Methodologies, Language Support

- **Self-Optimizing Systems**
  - Application of Autonomic Computing (M-A-P-E Cycle),

- **Social and Environmental Aspects of Computing**
  - Human-Provided Services, Crowdsourcing, Green Computing, ...

- ...
Master's Theses

- Variety of Interesting and Relevant Topics
- Goal: Achieve an Actual **Research Contribution**
- Often Integrated with Research Projects at our Institute
- Usually Strong **Focus on Implementation**
- Expected Outcome:
  - problem analysis, review of related work, ...
  - prototype implementation
  - thorough evaluation of the prototype (performance, qualitative aspects, …)
  - summarize results in thesis (~80-100 pages)
- Total Expected Duration: 5-9 Months (apprx.)
- Theses **Often Published as Scientific Papers**
  - workshop, conference or journal paper
Thesis Topic #1

- **Working Title:** Optimized Strategies for Elastic Application Deployment in the Cloud

- **Problem:** Deployment of Elastic, Scalable Applications
  - scale with increasing load: component duplication, state migration
  - runtime adaptation, (de-)allocation of computing resources
  - currently often tailor-made and error-prone

- **Idea:** Deployment Strategies Decoupled from App. Code
  - app. exposes *metadata*: load parameters, distribution strategy
  - planner uses metadata for *optimization* and reconfiguration

- **Technologies:** JavaEE, Web Services, Opt4J(?), Eucalyptus

- **Context:** WS-Aggregation Framework
  [http://www.infosys.tuwien.ac.at/staff/hummer/WS-Aggregation/](http://www.infosys.tuwien.ac.at/staff/hummer/WS-Aggregation/)

- **Contact:** hummer@infosys.tuwien.ac.at
Thesis Topic #1

- WS-Aggregation Framework

- Continuous Aggregation of Web Data
- Distributed Processing
- Scalability and Performance Requirements
Thesis Topic #2

- **Working Title:** Measuring Service Usage with Multi-Operation API Coverage Metrics
- **Problem:** Determine Coverage from Logged Invocations
  - coverage = #(logged interactions) / #(possible interactions)
  - important for two distinct goals:
    - to assess whether software testers have performed a good job
    - to derive usage statistics
  - problem space (number of possibilities) is huge, constraints/simplifications/assumptions needed
  - present: customizable API coverage for single service operations
  - wanted: extend notion of API coverage to operation sequences

- **Context:** TeCoS Framework (Test Coverage of Service-based systems), papers: http://www.infosys.tuwien.ac.at/staff/hummer
- **Contact:** hummer@infosys.tuwien.ac.at
Thesis Topic #3

- **Context:** COPAL Framework
  - [http://www.infosys.tuwien.ac.at/m2projects/sm4all/copal/](http://www.infosys.tuwien.ac.at/m2projects/sm4all/copal/)
  - Context-awareness framework
  - Helps applications understand the environment
    - Location
    - Activity
    - Situation
    - Interactions
  - Allows applications to adapt to changes in the environment

- **Topics**
  - Green buildings & energy efficient living
  - Context-aware applications for smartphones
  - Self-adaptations
  - Collaborative learning

- **Contact:** Fei Li, fei@infosys.tuwien.ac.at
Similar topics, but smaller scale and less effort
- Extended Functionality of Existing System
- User Interfaces
- Visualizations
- Proof-of-Concept Prototypes
- Evaluation of Possible Extensions and Future Alternatives
- ...

If you are generally interested, just drop us a line!
- The concrete topic can often be tailored to your interests

You may also suggest your own topics
- Topics should contain conceptual/technical challenges, i.e., „Implementation of a Website for Company XY“ is not an option
See you soon @ DSG ... ;-) 

This presentation will be uploaded to: http://www.infosys.tuwien.ac.at/staff/hummer/