Formal methods in context of D3S Activities

http://d3s.mff.cuni.cz
Charles University in Prague

Faculty of Mathematics and Physics

Mathematics

Physics

Computer Science

Formal and Applied Linguistics

Software and Computer Science Education

Theoretical Computer Science and Mathematical Logic

Software Engineering

Distributed and Dependable Systems

Applied Mathematics

Since 1348
Has been active for 15 years

Since July 1, 2010:

Head
- Associate professor
  - Tomáš Bureš

Members
- Professor
  - František Plášil

- 3 associate professors
  - Petr Tůma
  - Tomáš Bureš
  - Petr Hnětynka

- assistant professors
  - Lubomír Bulej
  - Jan Kofroň
  - Pavel Parízek

- ~ 10 Full-time Ph.D. students

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DSRG/D3S – Areas of interest/subgroups

• Software components
  ▪ Component model (SOFA 2, SOFA HI)
  ▪ Components in operating systems

• Formal methods
  ▪ Code model checking (GMC)
  ▪ Checking code against behavior specification
    • Using Java PathFinder (NASA)
  ▪ Use cases in plain English converted to BP
  ▪ Analysis of dynamic languages (PHP)

• Performance prediction and benchmarking
  ▪ Regression benchmarking
  ▪ Performance prediction
Past projects

- **Middleware Benchmarking**
  - IONA Technologies, Borland Int.
    - Corba, EJB
  - Pepita/ITEA/Eureka
    - EJB
    - INRIA, France Telecom, Philips, Bull, ..

- **Regression benchmarking**
  - MONO project
  - .NET for Linux, financed by Novell, ...
  - BEEN project ([been.objectweb.org](http://been.objectweb.org))

- **SW Components**
  - ObjectWeb ([www.ow2.org](http://www.ow2.org))
    - SOFA
  - OSMOSE / ITEA/Eureka: behavior, deployment
    - Telvent, Philips, France Telecom, ...
    - SOFA, Fractal (INRIA, France Telecom)
  - **OSIRIS / ITEA/Eureka: higher-level services**
    - Telvent, Philips, France Telecom, ...
  - France Telecom
    - Behavior protocols for Fractal component model
  - CoCoME contest ([www.cocome.org](http://www.cocome.org))

- **Q-ImPrESS (7th Framework, STREP)**
  - *Quality prediction for Evolving Service Oriented Software*
  - University of Karlsruhe
  - ABB Germany
  - Itemis Germany
  - Politecnico di Milano
  - Ericson Tesla
  - SOFA 2.0, SOFA HI
    - Combining SW components and services
  - ...
Current projects

- **DEECo (Dependable Emergent Ensembles of Components)**
  - component model targeting design of systems consisting of autonomous, self-aware, and adaptable components

- HelenOS – research operating system

- **ASCENS**
  - Autonomic service component ensembles
  - EU FP7 project

- **WeVerca – verification Framework for dynamic languages**
  - taint analysis for PHP