RUI ZHANG’s RESEARCH AND DEVELOPMENT DELIVERABLES

**Patents**


   This technique, code named *Datalace*, will be incorporated into coming releases of IBM enterprise system management products to minimize data noise and facilitate better autonomic management decision making. **Technical details still sensitive and (partly) available upon request.**


   An implementation of this method, code named *zDolphin*, has been shipped to hundreds of IBM enterprise server OS developers to help them produce more efficient code. **Technical details still sensitive and (partly) available upon request.**

**Core Peer-reviewed Publications**


**Other Peer-reviewed Publications**


### Manuscripts under review or preparation


### Thesis’s


### Public Talks and Presentations


5. Progress presentations at UK DTI Project Reviews, October 2004 and May 2005.

### Software

1. **zDolphin Trace Annotator** - IBM proprietary. Java 6000 lines, Prolog 500 lines, Shell script 100 lines.

   zDolphin contains two parts: the Model Learner and the Trace Annotator. The Model Learner is only executed once per zSeries mainframe model, generating training examples from hardware simulator outputs and inducing an accurate (99.9%) performance hazard (e.g. Address Generation Interlock) model through Inductive Logic Programming. The Trace Annotator consumes instruction sequence, flags and visualizes performance hazards using the model learned.

2. **SOA Workload Management System** - Open source. Java 2400 lines, C 200 lines, Matlab 300 lines.

   The software consists of four components: 1) Instrumentation Points that are placed into Tomcat, Axis and web service code to trace and time user requests; 2) a Reporting Agent on each machine that reports the captured time and workflow data across using Java Messaging Services; 3) a Request Visualizer that presents the workflow and time information in the form of a Petri-net; and 4) a Performance Problem Locator that maintains a response time Bayesian network model from workload data and computes damage scores for monitored services using Matlab Bayesian toolbox routines.

3. **Sensor Network Event Manager** - Open source. nesC 300 lines. Java 200 lines.

   The infrastructure features an agent running on each node in sensor network driven by TinyOS, and a PC-based manager which consumes and visualizes faulty events (e.g. low battery) reported from the agents using an Intel ad-hoc routing protocol.

4. **SWI-Prolog z/OS Extension** - Open source. Compile script 100 lines. C 100 lines.

   The extension deals with compiler and character set differences between z/OS and existing SWI-Prolog-compatible platforms, thus enabling the SWI-Prolog engine to compile and run on IBM zSeries mainframes.

### Official Websites Designed

1. **IBM T.J. Watson Research Center Enterprise Systems Department Website**
   

2. **IBM Enterprise Workload Manager Product Website**


3. **Heterogeneous Workload Management Project Website**
   
   [http://web.comlab.ox.ac.uk/oucl/research/areas/softeng/eWLM/](http://web.comlab.ox.ac.uk/oucl/research/areas/softeng/eWLM/)