Analysis and Specialization for Pervasive Systems

EU Future & Emerging Technologies Project IST-2001-38059

Goals of the Project

Automate as much as possible the development of sophisticated and reliable software for pervasive computing platforms.

Use high-level languages and analysis, verification, and specialization techniques.

Develop a novel toolkit based on the ideas above and make it available as open-source code.

Technical Approach

- Study requirements of pervasive computing applications; develop case studies.
- Advance the state of the art in:
  - analysis, validation, and debugging based on abstract interpretation.
  - program specialization, and its combination with abstract interpretation.
- Develop a novel, integrated tool-set implementing these techniques.
- Apply to case studies, using real-life languages and benchmarks.
- Make it all available as open source code.

Project Overview

Partners:

- Technical U. of **Madrid**, Spain (G. Puebla, M. Hermenegildo)
- University of **Bristol**, U.K. (H. Muller)
- University of **Southampton**, U.K.
  University of **Düsseldorf**, Germany (M. Leuschel)
- **Roskilde** University, Denmark (J. Gallagher)

Total cost: 1.444.959 Euro
EU funding: 1.118.700 Euro
Project duration: 1 Nov. 2002 to 31 Oct. 2005.
WWW: http://clip.dia.fi.upm.es/Projects/ASAP/

Technical Achievements

The project has not finished yet but the main goals have been reached or are within reach:

- A set of case studies from pervasive and wearable computing projects. Furthermore, we were able to automatically squeeze pervasive application kernels written in Ciao Prolog onto a Gumstix embedded processor.
- A novel analysis and specialization tool-set.
- Experimental proof that the tool-set makes it possible to produce applications in high-level languages (including CLP) that: are correct, meet the efficiency requirements, and can be applied to a variety of programming languages, including assembly code for different devices.

Scientific Dissemination

In the first two years of the project: over 30 publications in international conferences and journals

- 6 invited talks in international conferences
- 3 workshops organized