Elena Lucherini

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RESEARCH INTERESTS

I am interested in the analysis, design and development of computer systems. My current work consists in investigating methods to improve isolation of real-time applications in multicore systems, namely addressing the problem of cache interference.

EDUCATION

Scuola Superiore Sant'Anna, University of Pisa 2014 - *present*
M.Sc. in Embedded Computing Systems

- *Thesis:* Improving predictability of real-time applications on multicore platforms with software cache-partitioning method page coloring *(ongoing)*.
- *Advisors:* Giorgio Buttazzo (SSSUP) and Björn Brandenburg (MPI-SWS).

University of Pisa 2011 - 2014
B.Sc. in Computer Engineering

- *Thesis:* Web interface for air quality index monitoring system MonIQA.
- *Advisor:* Giuseppe Anastasi (UniPi).

EXPERIENCE

Research Intern Dec. 2016 - *present*
Max Planck Institute for Software Systems Kaiserslautern, Germany

- *Advisor:* Björn Brandenburg.
- As part of my Master's thesis, I am looking into methods to improve the isolation and predictability of real-time applications on multicore platforms. In particular, I am implementing a software-based cache-partitioning mechanism, called *page coloring*, on Linux PREEMPT-RT, in order to mitigate the effects of cache interference.

ACADEMIC PROJECTS

***BeaCube:* An Event-Triggering System with iBeacon**

- Developed in Node.js. Noise filtering, event logging, and possibility of seamlessly adding custom third-party events.
- *Links:* GitHub, Report

Snow Level And Avalanche Monitoring: A Scale Distributed Application

- Developed in C on Contiki OS, network simulated with Cooja.
- *Links:* GitHub, Report

***MonIQA:* Air Quality Index MONitoring**

- Web interface for the visualization of official data about the quality of the air in Italy *(Bachelor's thesis)*.
- *Link:* http://anasim.iet.unipi.it/moniqa/ (in Italian).

A Few Real-Time Games

- Fishing game, developed in C using the Allegro game programming library: Report.

- ”Candy Crush”-like game for STM32F4 microcontrollers, developed in C on Erika Enterprise RTOS: GitHub, Report.
- Multi-player First Person Shooter, developed in the XVR framework.

Classifiers of Risk Perception

- Developed in Matlab, using neural networks and ANFIS. Comparison among the different classifiers using a genetic algorithm.
- *Link:* Report.

Cyclic Redundancy Check: A VHDL Implementation

- Tested with Active-HDL, synthesized in Xilinx ISE.
- *Link:* Report

3DoF Haptic Interface: Position Control

- Developed in Simulink. Kinematics of the device, driver calibration, gravity compensation, and design of a digital controller.

ACHIEVEMENTS

- Press coverage on Bachelor’s thesis at national level, on online and printed newspapers such as La Nazione, Repubblica.it, and Yahoo! Sport (all links are in Italian). Coverage on UniPi’s official news page.
- Recipient of a merit-based part-time collaboration opportunity with UniPi in 2015, chosen among the students of the university.
- Member of the winning team of *Accenture Italia Innovation Game*, 2016.
- *BeaCube* chosen as best project for the Spring 2016 *Industrial Applications* class at UniPi.