



 POLITECNICO DI MILANO

Embedded System and Computer Architecture

Dipartimento di
Elettronica e Informazione

Fostering Innovation for Cyber-Physical Systems, Advanced Computing & Manufacturing
Horizon 2020 LEIT-ICT Work Programme 2014/15

Overview of POLIMI Competencies

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People and projects

Main scientists

- 2 associate professors, 1 full professor (>20 Y of experience each)
- 4 assistant professors, 3 post-docs (>10 Y exp. each)
- 10 PhD students, dozen of Master students

Interaction with industry

- 18 years of experience in technology transfer and pilot products development
- Wide network of LEs and SMEs in several ICT related fields
- Many co-owned patents
- Research contracts
- **Consultancy and creation of startups**
- **Development of commercial products exploiting inertial sensors (already on the market)**

EU-funded Projects

- Present FP7 (kick off sept-oct 2013)
 - HARPA (Thermal reliability, Runtime Mgmt) adaptivity, Project Coordinator
 - CONTREX (Embedded Systems, including WSNs and distributed ES), WPL
- Past FP7
 - 2PARMA (Runtime Mgmt), Project Coordinator. **RANKED AS “SUCCESS STORY” BY THE EU**
 - COMPLEX (Embedded Systems, including WSNs), WPL
 - SMECY (Embedded computing), WPL
 - MULTICUBE (Design Space Exploration on multi/Many cores), Project Coordinator
- Main past projects (before FP7)
 - WASP (WSNs)
 - PEOPLE (sw power estimation) –WPL
 - POET (sw power optimization) – WPL
 - SEED (Hw/Sw Codesign), coordinator

Areas of expertise and products

Competencies

- **System-level low power design**
- **Software energy optimization**
- Real-time operating Systems
- Multi-many core architectures
- **Power, Thermal, Energy management**
- **Reliability**, robustness
- Networks on Chip (NoC)
- Design Space exploration
- Scheduling for soft real time on multi-many cores
- Mapping application onto parallel architectures
- **Run-time resource management**
- Design flows and co-simulation
- **Compilers**, programming paradigms
- **Wireless sensor networks**
- **Design of automotive products using inertial sensors**
- **Security for embedded systems**

Tangible products

- Run-time resource management for multi/many cores systems
 - BBQ tool framework (open source)
- Automatic Design Space Exploration
 - **MOST** tool (open to consortiums)
- Source-level Software power analysis (and optimization)
 - **SWAT** tool (open to consortiums)
- Wireless Sensor Networks and distributed embedded systems
 - **PoliNode** (hw + proprietary OS), design methodology and models
- Power/Thermal/Performance/reliability simulation and optimization
 - HANDS toolchain (open to the consortiums), including NoC optimization
- Side-channel analysis and countermeasures
 - **MEET** toolchain