

Security and Embedded Laboratory

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September, 7th-8th 2017



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VERSITA' DEGLI STUDI DI
FEDERICO II

DIPARTIMENTO DI INGEGNERIA ELETTRICA
E DELLE TECNOLOGIE DELL'INFORMAZIONE

Outline



- 1 The Research Group
- 2 Research Activities
- 3 Research Projects
- 4 Partners

The Embedded Research Group



- The Department of Electrical Engineering and Information Technologies has more than 120 full time academics and more than 50 researchers, including post-docs and Ph.D. students.
- The group involves **five full-time academics** and **nine researchers**:

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- The group involves **five full-time academics** and **nine researchers**:
 - Two full professors;



prof. Antonino
Mazzeo



prof. Nicola
Mazzocca

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- The group involves **five full-time academics** and **nine researchers**:
 - Two full professors;
 - Two associate professors;



prof. Valeria
Vittorini



prof. Valentina
Casola

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Dr. Alessandro
Cilardo



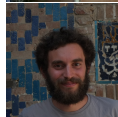
Dr. Flora Amato

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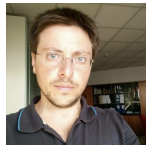
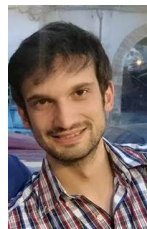
- The group involves **five full-time academics** and **nine researchers**:
 - Two full professors;
 - Two associate professors;
 - Two assistant professors;
 - Six post-docs;



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 - Two associate professors;
 - Two assistant professors;
 - Six post-docs;
 - Three Ph.D. Students;



Teaching



- The group manages five courses for the computer engineering Master Degree:
 - **Architettura dei Sistemi di Elaborazione** (~100 students);
 - **Calcolatori Elettronici II** (~100 students);
 - Secure System Design (~30 students);
 - Advanced Computer Architecture and GPU Programming (~30 students);
 - Sistemi Embedded (~30 students);

Current Main Research Activities



- The research activities of the Security and Embedded Laboratory group focus on:
 - Security of digital system:
 - hardware security and trust;
 - security of wireless devices;
 - High performance computing:
 - heterogeneous architectures;
 - post-Moore technologies;
 - critical-systems;
 - Formal verification and modeling of systems:
 - model-based analysis and assessment;

MANGO

Exploring manycore architectures for next-generation HPC systems



Performance/power efficiency

- High performance computing is dealing with the gap between the applications' requirements and the availability of underlying computing architecture;
- Need for customization of architectures to meet applications' demand and reach better performance/power-efficiency.

Infos

- EU's H2020-FETHPC-2014;
- Duration: 36 months;
- EU contribution: ~ 5M

Local Key members

- Dr. Alessandro Cilardo;
- Dr. Edoardo Fusella;

MUSA

Multi-cloud secure applications



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Security-intelligent lifecycle management

- Performance and the security management of the cloud-provisioned resources influence the security of multi-cloud applications;
- MUSA presents a framework able to support security-aware multi-cloud application lifecycle management.

Infos

- EU's H2020-ICT-07;
- Duration: 36 months;
- EU contribution: ~ 3M

Local Key members

- Prof. Valentina Casola;
- Dr. Alessandra De Benedictis;

SPECS

Secure Provisioning of Cloud Services based on SLA Management



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Security-as-a-Service

- User-centric negotiation of security parameters in Cloud SLA;
- Monitoring the fulfillment of SLAs agreed with one or more CSP;
 - SPECS monitoring services also enable notifying both users and CSPs, when a SLAs not being fulfilled (e.g., due to a cyber-attack).

Infos

- EU's FP7-ICT-2013;
- Duration: 36 months (ended);
- Budget: ~4.5

Local Key members

- Prof. Valentina Casola (vice-coordinator);
- Dr. Alessandra De Benedictis;

CRYSTAL

Critical system engineering acceleration



Model Engineering for safety critical applications

- Engineering methods on industrially relevant use cases (railway);
- Framework for interoperability;
- Support SME integration into the embedded systems engineering ecosystem;

Infos

- EU's ARTEMIS-ICT-2013;
- Duration: 36 months (ended);
- Budget: 82M;

Local Key members

- Prof. Valeria Vittorini;
- Dr. Roberto Nardone;

Academic Relationships



- The Security and Embedded Group is involved in several research projects, most of them funded by European Commission, Italian government and Campania Region;
- These activities are carried out in collaboration with many national and international working group, including:
 - University of Montpellier, University of Valencia, Imperial College London, Politecnico di Torino, University of Campania Luigi Vanvitelli, Italian Aerospace Research Center, and many others.

Industrial Relationships



- The research group has also several partnerships ongoing with private companies and organization in the area of design, security and dependability of embedded systems:
 - Technalia, CA, Lufthansa, Hitachi Railway Systems (Ansaldo STS), ST Microelectronics, Micron, Distretto Trasporti Dattilo, IVM, Bit4ID.

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