Resilient Computing Lab

Dipartimento di Matematica e Informatica

(DiMaI)

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RCL

RESILIENT COMPUTING LAB

UNIVERSITÀ
DEGLI STUDI
FIRENZE

RCL Group members

Paolo Lollini
Researcher

Andrea Bondavalli
Full Professor
Head of RCL

Andrea Ceccarelli
Researcher

Enrico Schiavone
PhD Student

Mohamad Gharib
Post-Doc

Tommaso Zoppi
Post-Doc

Research Projects since 2016 – funders and timeline

Regione Toscana

MINISTERO DELL'ISTRUZIONE, DELL'UNIVERSITÀ E DELLA RICERCA

2015 2016 2017 2018 2019

TENACE: Italian PRIN 2010

Concerto: Artemis 2012

AMADEOS: ICT-FP7-610535

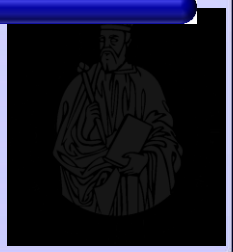
DEVASSES: IRSES-GA-2013-612569

IRENE: JPI-URBAN EUROPE

SISTER: Tuscany FESR

TOSCA-FI: Tuscany FAR-FAS

ADVANCE: H2020-MSCA-RISE-2018



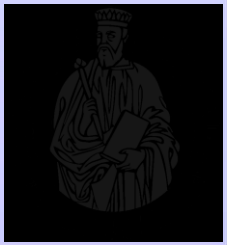
Main expertise on *dependable* and *secure* systems and infrastructures

Design

- Architectures for dependable, secure, real-time systems
- Security, intrusion detection/tolerance
- Monitoring, analysis, diagnosis

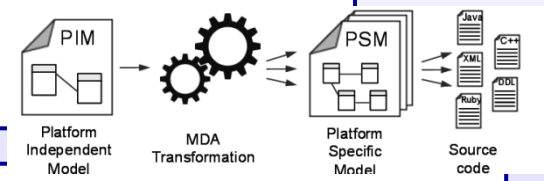
Validation and Assessment

- Threats analysis and validation
- Robustness and security testing
- Stochastic modeling

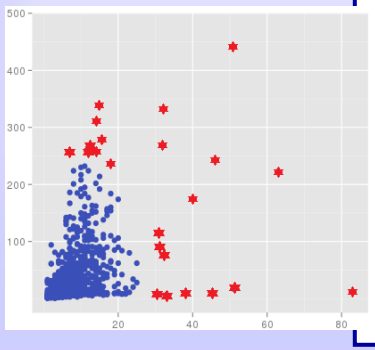


Research Activities – Design

- Dependability and performance analysis using Model-Driven Engineering (MDE) techniques
  - The analysis model is automatically derived from models in high-level engineering languages (e.g., UML)
  - Development of automated transformation for the generation of Stochastic Petri Nets models
- Definition of constructs for the specification of dependability properties at UML level
  - CHESS ML Dependability Profile for embedded systems
  - AMADEOS Profile for SoS



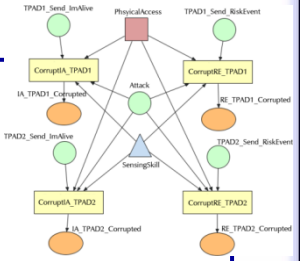
Statistical anomaly-based fault-detection



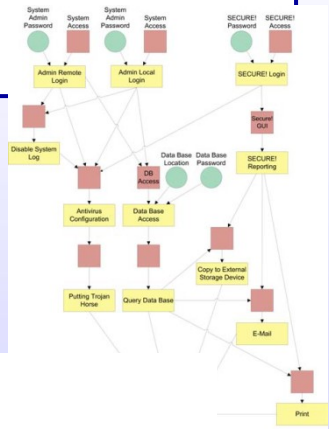
- Algorithms for anomaly-based error/intrusion detection by analyzing key system variables
- Statistical and adaptive

Research Activities – Assessment

Stochastic modeling and evaluation of systems, Critical Infrastructures, protocols, algorithms

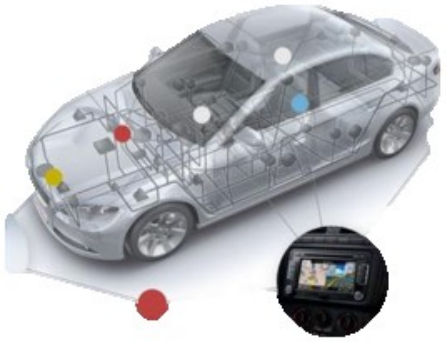


- To evaluate dependability, security, performance, performability
- **Security Models** considering different **Attack Execution** paths and different **Adversary Profiles**, for quantifying the Impact of Malicious Attacks.



Analysis of system/assets threats and identification of countermeasures

- Can support system design, using a logical description of the system
- Can validate system deployment an support maintenance procedures



Interactions with Companies

- Resiltech s.r.l
  - Ex-spinoff of UNIFI
- Ongoing Collaboration with RFI
  - Devising Generic Fault-Tolerant Architectures, including prototypes of key modules and compo
  - Cooperation with other universities
- Periodical training courses on
  - Safety Critical Systems
  - Fault-Tolerant Architectures
  - V&V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