HiPeRT Lab — High-Performance Real-Time Lab

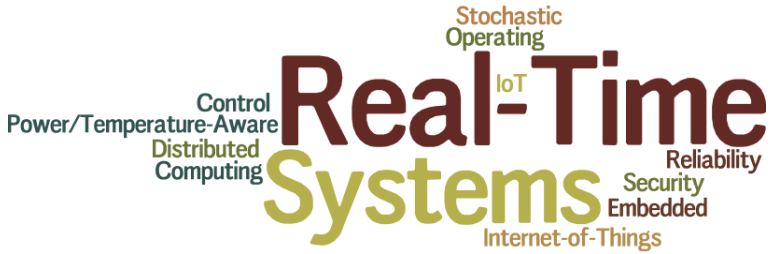
In a nutshell

- ✓ Since 2014 @UniMoRe
- ✓ 4 profs, 7 post-docs, 4(+2) PhDs, 1 admin staff + undergrads
- ✓ http://hipert.unimore.it

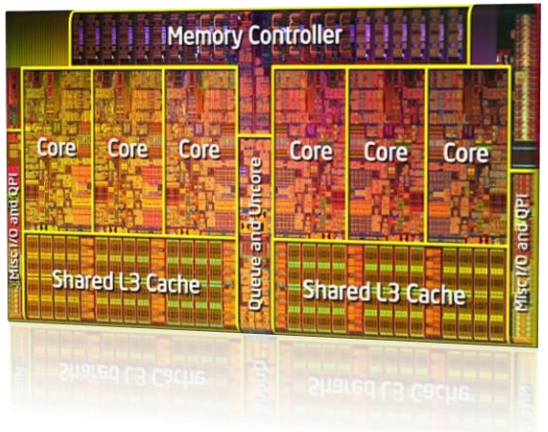
Funded by

- ✓ EU projects (H2020)
- ✓ E-R regional projects
- ✓ Industrial contractors

OPEN-NEXT



Embedded
Systems design



What do we do?

Industry 4.0

Autonomous driving
& ADAS

Neural networks
Artificial intelligence

Current EU projects and partners

HERCULES: High-Performance Real-time Architectures for Low-Power Embedded Systems

- ✓ Coordinators
- ✓ Automotive & avionics
- ✓ Jan 2016 – Dec 2018

HERCULES http://hercules2020.eu

ENABLE-S3: European Initiative to Enable Validation for Highly Automated Safe and Secure Systems

- ✓ Industry 4.0
- ✓ April 2016 – March 2019

ENABLE-S3 http://www.enable-s3.eu

I-MECH: Intelligent Motion Control Platform for Smart MECHatronic Systems

- ✓ Industry 4.0
- ✓ June 2017 – December 2020

I-MECH

Current regional projects and partners

OPEN-NEXT

- ✓ POS-FESR (ER region)
- ✓ Industry 4.0
- ✓ April 2017 – March 2020

OPEN-NEXT

http://www.t3lab.it/progetti/open-next/

COOPERATION with leading companies

- ✓ Packaging
- ✓ Semantic intelligence
- ✓ Document processing & analyis
- ✓ Computing platform manifactureres
- ✓ Automotive
- ✓ Defense
- ✓ …

NVIDIA

BOSCH

MASERATI

EXPERT SYSTEM
SEMANTIC INTELLIGENCE

SACMI

FINMECCANICA

doxee
Your Communication › Our Innovation

DATALOGIC

HERCULES

High-Performance Real-time Architectures for Low-Power Embedded Systems

The first industrial-grade framework for future real-time embedded systems

"An order-of-magnitude improvement of energy efficiency and cost"

AIRBUS

MAGNETI MARELLI

HERCULES

http://hercules2020.eu

http://hercules2020.eu

OPEN-NEXT

Open-source real-time software structures for next generation industrial embedded platforms

- ✓ Programming frameworks and methodologies
- ✓ Operating system support
- ✓ Tools for software development and real-time analysis

...for next-generation industrial (4.0) systems on multi-/many cores

OPEN-NEXT

- ✓ Key industrial partners

SACMI

DATALOGIC

http://www.t3lab.it/progetti/open-next/

- ✓ Research centers
  - TTLab, INFN
  - CRIT, Innovation centre

Istituto Nazionale di Fisica Nucleare
INFN | TTLab

t3lab TECHNOLOGY TRANSFER TEAM

crit SCOUTING YOUR NEXT TECHNOLOGY

softech-ict

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA A.D. 1088

ENABLE-S3

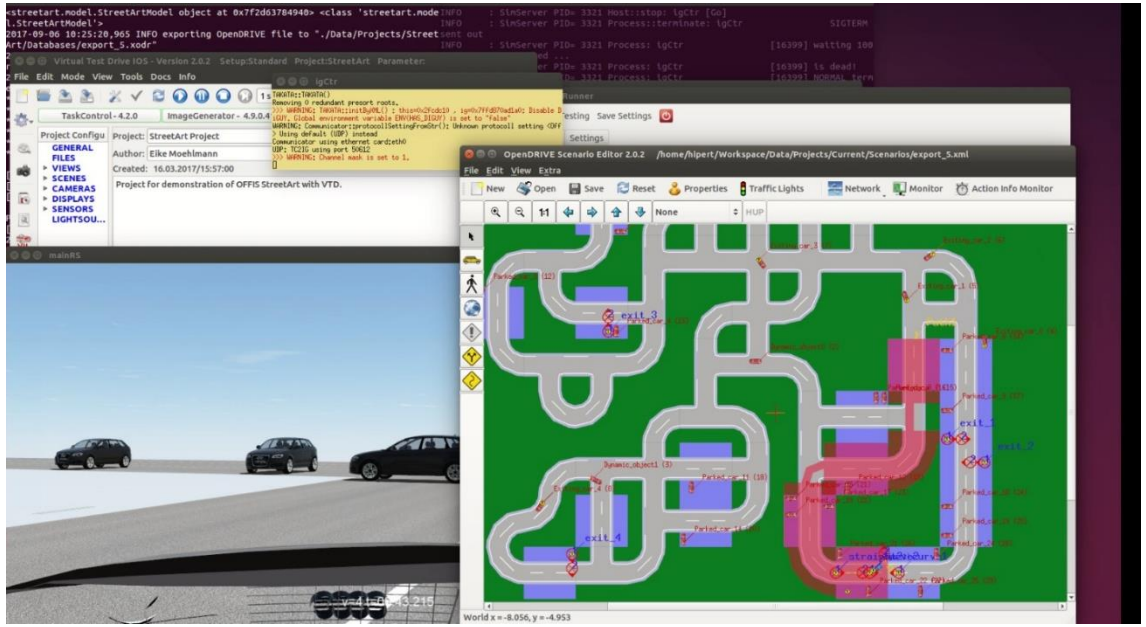
European Initiative to Enable Validation for Highly Automated Safe and Secure Systems

"Cost-efficient cross-domain virtual and semi-virtual V&V platforms and methods for Autonomous Cyber-Physical Systems"

- ✓ ECSEL Joint undertake (50+ partners!!!)
- ✓ Use-case driven, significant industrial presence

Our role

- ✓ Automate realistic scenario generation process and VP simulations
  - Focus on an valet parking ADAS
  - In unknown scenarios



Intelligent Motion Control Platform for Smart Mechatronic Systems

- ✓ Industry 4.0 requires smart, safe and reliable production complexes
  - Focus also on size, motion speed, precision, adaptability, self-diagnostic, connectivity, new cognitive features, etc..

- ✓ I-MECH will deliver augmented intelligence for wide range of cyber-physical systems having actively controlled moving elements

- ✓ Industry-driven, high degree of tech transfer

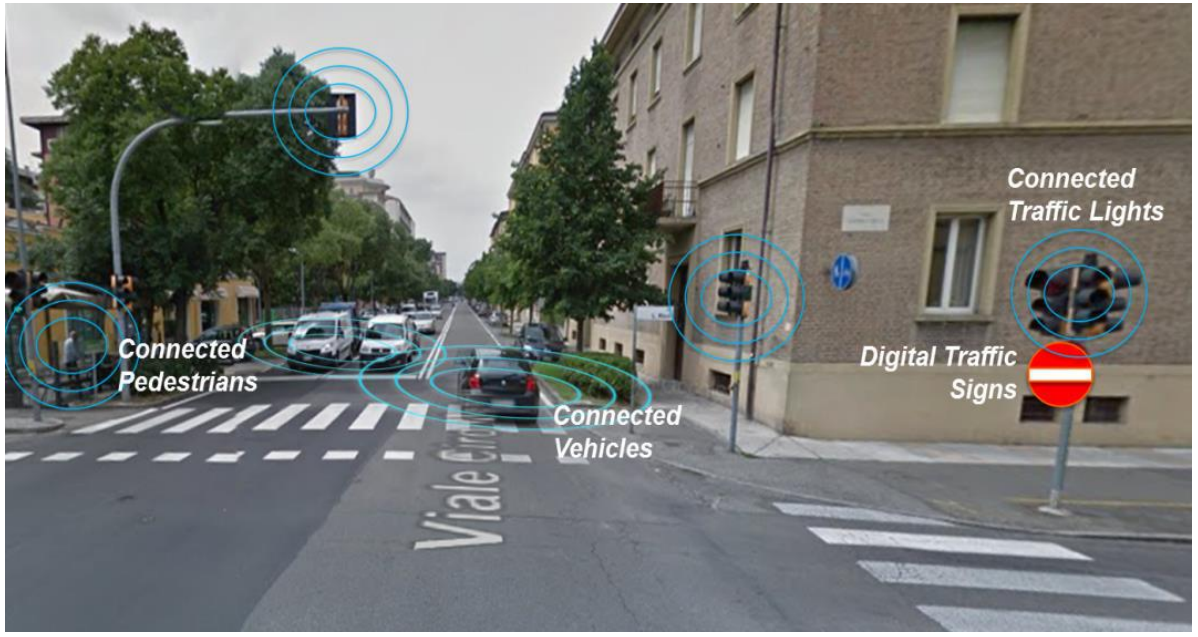
Our role

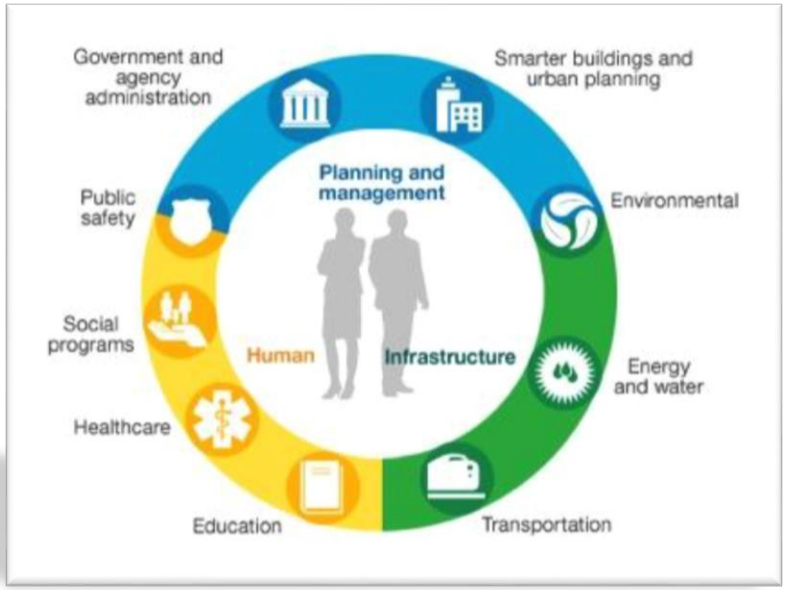
- ✓ Virtualization/OS on x86machines

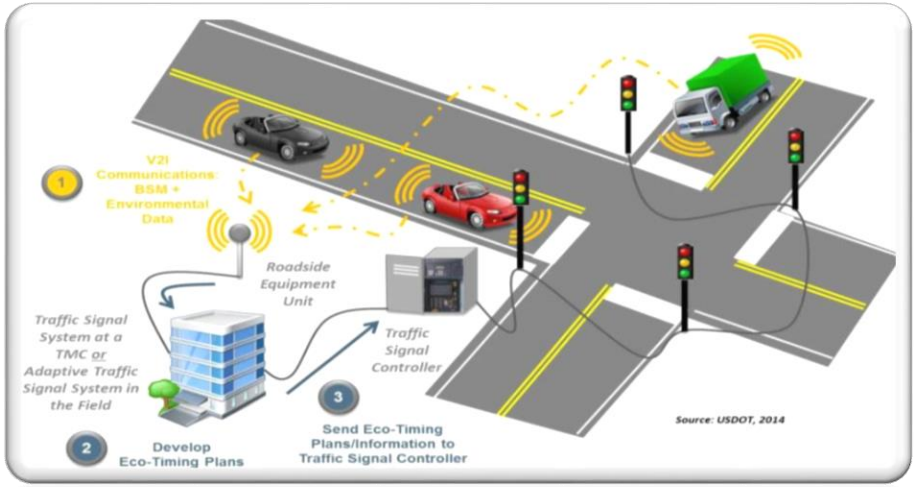
The Modena automotive smart area

The goal: a urban environment for city awareness, which integrates multiple (IoT) information channels to improve the quality of citizenship in terms of sustainability, services and safety.

- ✓ Testbed for research on smart cities, connected cities, autonomous driving…
- ✓ Both academical and industrial







http://hipert.unimore.it

OPEN-NEXT

HiPeRT Lab High-Performance Real-Time Lab