



UNIVERSITY OF CAGLIARI

DIEE - Department of Electrical and Electronic Engineering

MCLab

*Multimedia & Communication
Laboratory*

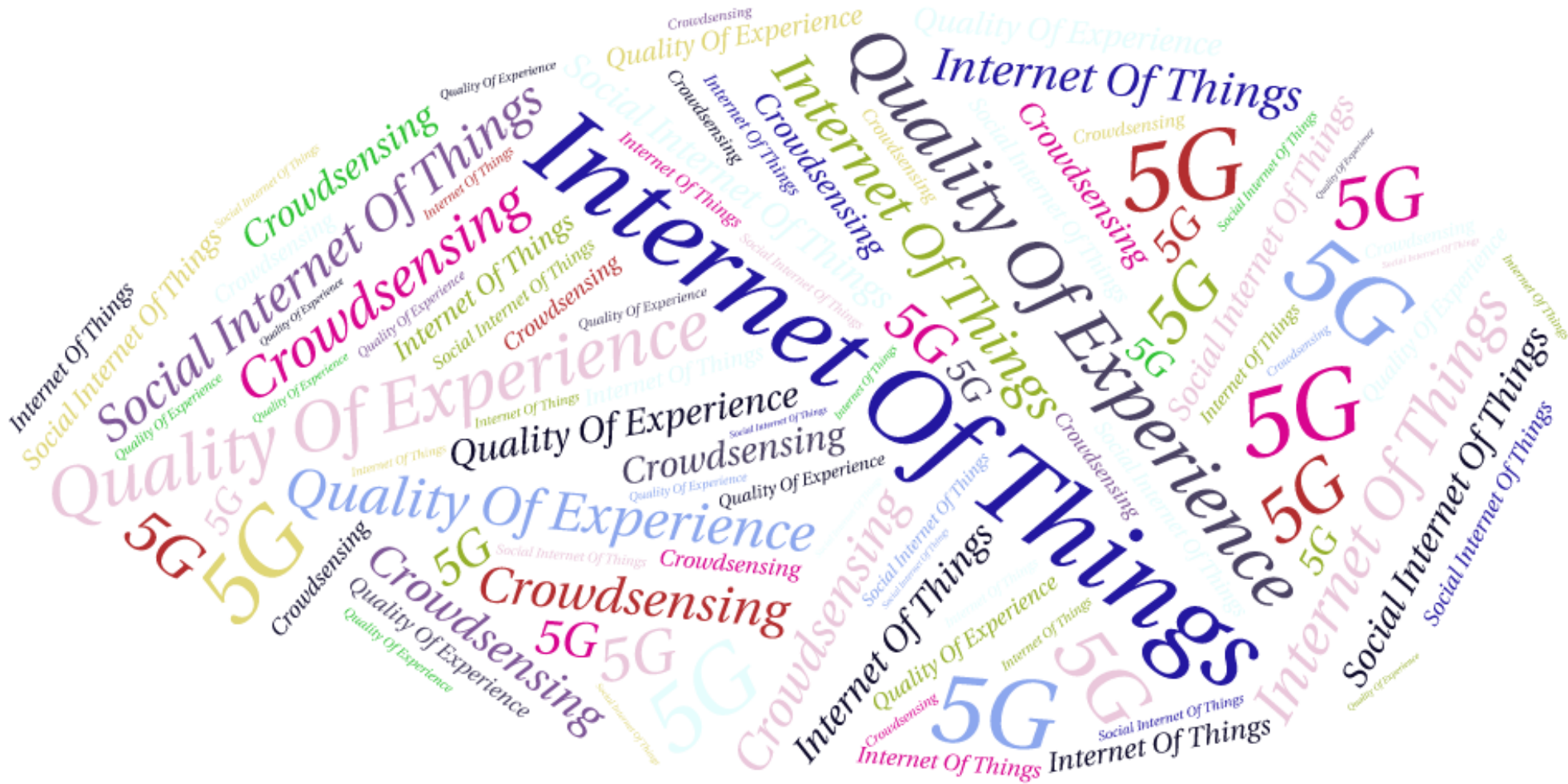
<http://mclab.diee.unica.it>

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Introduction

- The Multimedia & Communications Laboratory (MCLab) has been established in 1998.
- It is located at the Department of Electrical and Electronic Engineering (DIEE) of the University of Cagliari and is affiliated with the CNIT, the Italian University Consortium for Telecommunications.
- The Research Group of MCLab is made of around 20 people, including faculty members, research fellows and Ph.D. students.

Research activities

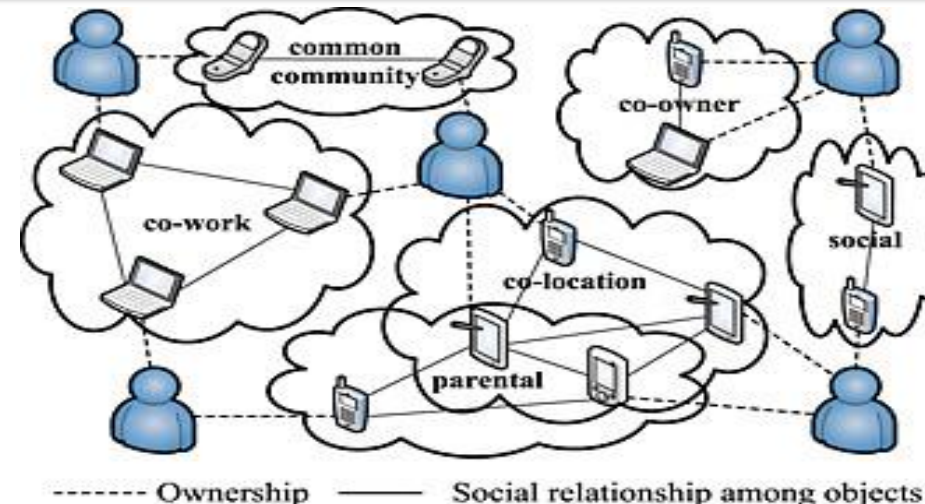


Internet of Things

- “A world wide *network of interconnected uniquely addressable objects, where objects look for others to provide composite services for the benefit of the humans*”



- The paradigm of “social networks of devices”
 - social ties create a social network of devices inherited from their owners
 - communication end-points identified in terms of social distance
 - device trustworthiness level computed by exploiting the view of the social network.

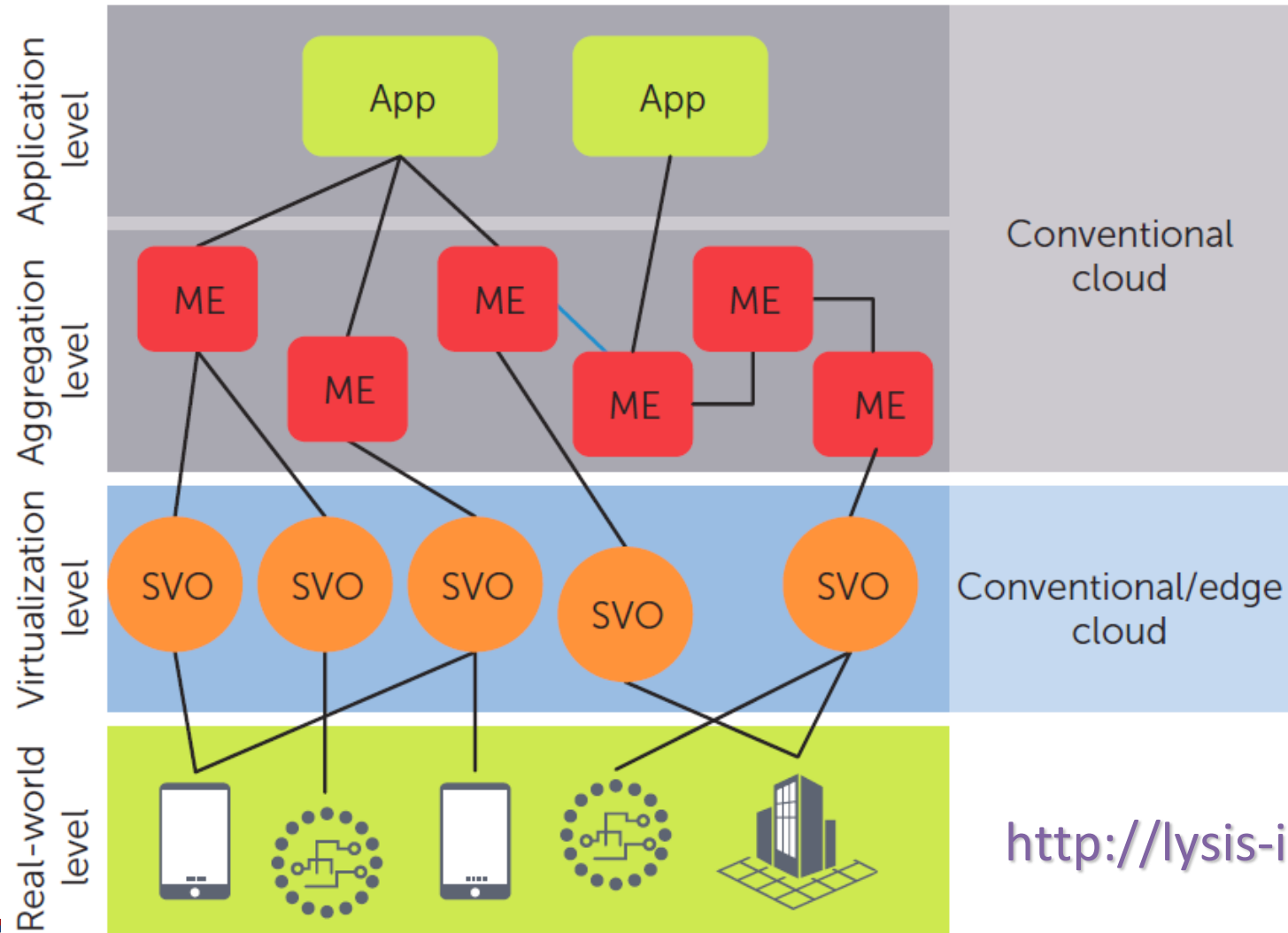


Advantages

- Navigability
- Scalability
- Trustworthiness

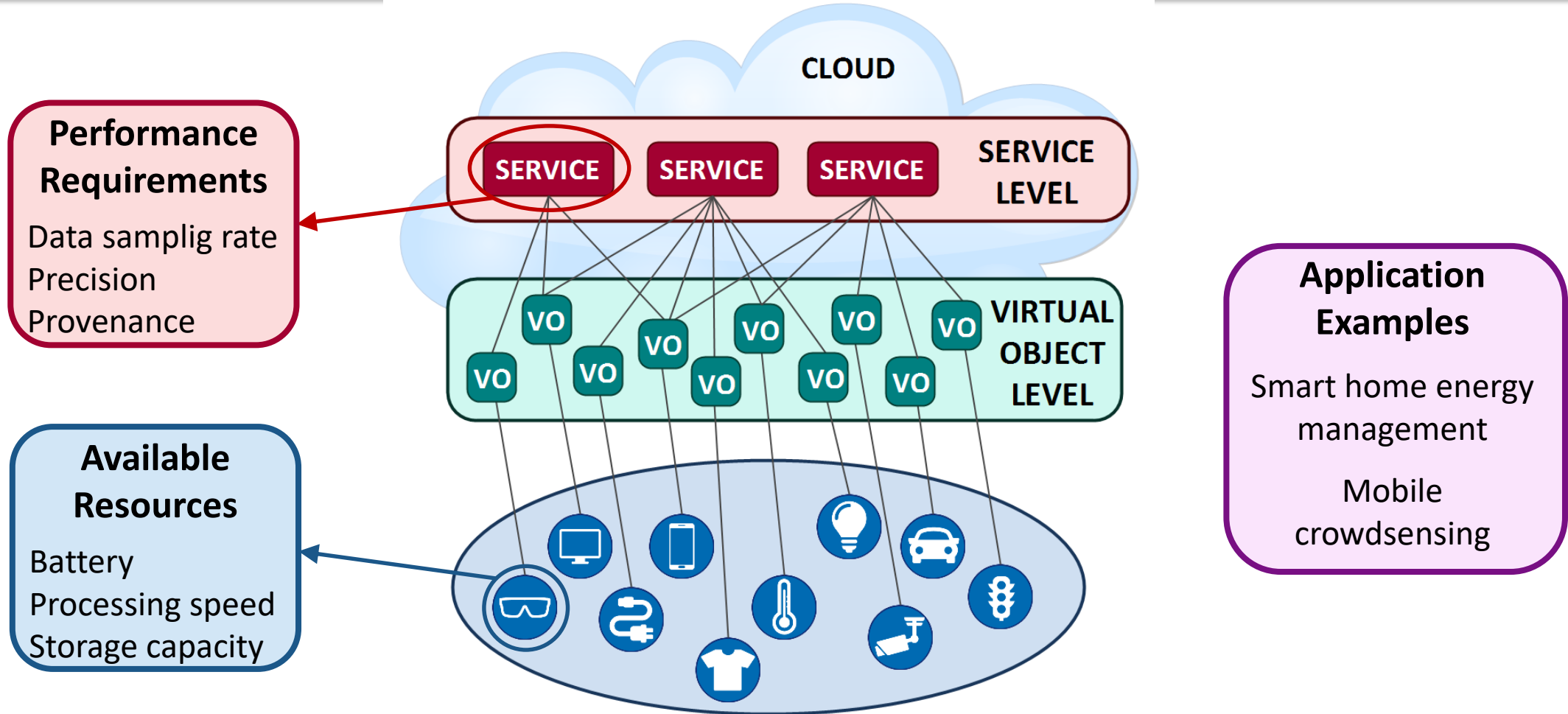
Reason	Humans	Things
<i>Become visible</i>	Increase popularity	Publish information/services
<i>Find resources</i>	Find old friends	Find information/services
<i>Obtain context information</i>	Get filtered information	Get environment characteristics
<i>Discover new resources</i>	Find new friends	Find new services/updated information

Lysis: a cloud IoT platform



<http://lysis-iot.com>

QoI/QoE-aware Resource Allocation



- Architectural solutions for the Cloud IoT
 - Conventional cloud
 - Edge/fog cloud
- Applications for the Cloud IoT
 - Social internet of vehicles
 - CrowdSensing
 - Nearby device detection
 - Sea/Air Pollution monitoring
 - Fleet Tracking
 - Vehicle Auto-Diagnosis

Quality of Experience - QoE



QoE definition and research focus

*“The **degree of delight or annoyance** of the user of an application or service. It results from the fulfillment of his or her **expectations** with respect to the **utility** and/or **enjoyment** of the application or service in the light of the **user’s personality and current state**”*

- Collaborative QoE-aware management among Over-The-Top (OTT) services and Internet Service Providers (ISP)
- On field QoE measurements: do equal subscribers (customers of the same ISP) receive the same QoE level?

Wireless Communications

- Cognitive Radios in TVWS
 - Devices able to detect and avoid primary licensed users (PUs) by adjusting functional parameters, such as carrier frequency, modulation type, and transmission power. Free channels in the UHF spectrum in each territorial area are called as TV White Spaces (TVWS).
- Vehicular Communications
 - Cooperation between high-speed vehicles (V2V) and between the vehicles and the roadside infrastructure (V2I) to create vehicular ad-hoc networks (VANETs) using the IEEE 802.11p standard and other technologies in the or in LTE band
- MBMS in LTE
 - Multimedia Broadcast / Multicast Services in LTE networks

Projects

- CagliariPort2020
 - Budget: 7 MEuros
 - Funded By: MIUR
 - Duration: 2015-2020
- QoE-NET
 - Budget: 550 KEuros
 - Funded By: H2020-MSCA-ITN-2014
 - Duration: 2015-2018
- Netergit
 - Budget: ca. 1.6KEuros
 - Funded By: MIUR
 - Duration: 2017-2020



Netergit

Projects

- Cog-lo
 - Budget (CNIT): 350 KEuros
 - Funded By: EU H2020
 - Duration: 2018-2021
 - <http://www.cog-lo.eu/>



Innovation

- The MCLab works to transform fundamental and basic research into products impacting industry, technology, and society.



GreenShare



SmarTicket

About us





UNIVERSITY OF CAGLIARI

DIEE - Department of Electrical and Electronic Engineering

Thank you for your
attention

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