THE CONSORTIUM

Academic and RTOs

Universitat Politècnica de Catalunya - BarcelonaTech
Spain, Barcelona

Centre Tecnològic de Telecomunicacions de Catalunya
Spain, Castelldefels

AIT Austrian Institute of Technology
Austria, Vienna

PIC & ASIC Developer

III-V Lab
France, Palaiseau

Ligentec
Switzerland, Ecublens

Innovative SMEs

Beamagine
Spain, Barcelona

Bifrost Communications
Denmark, Kongens Lyngby

System Integrators and Operator

Nokia Bell Labs
France, Paris

Nvidia
Israel, Yokneam

Magna
Sweden, Vargarda

Cosmote
Greece, Athens

OUR CV

11 partners
8 countries

Budget: M€ 5.2
EU-funded: M€ 4.0

Duration: 36M   01/2024 – 12/2026

Project Coordinator:
Dr. Jose Antonio Lázaro
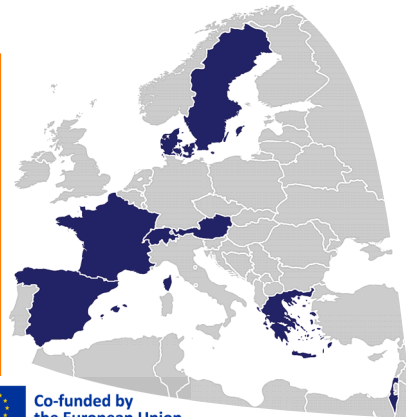Universitat Politècnica de Catalunya

✉ admin@6g-ewoc.eu
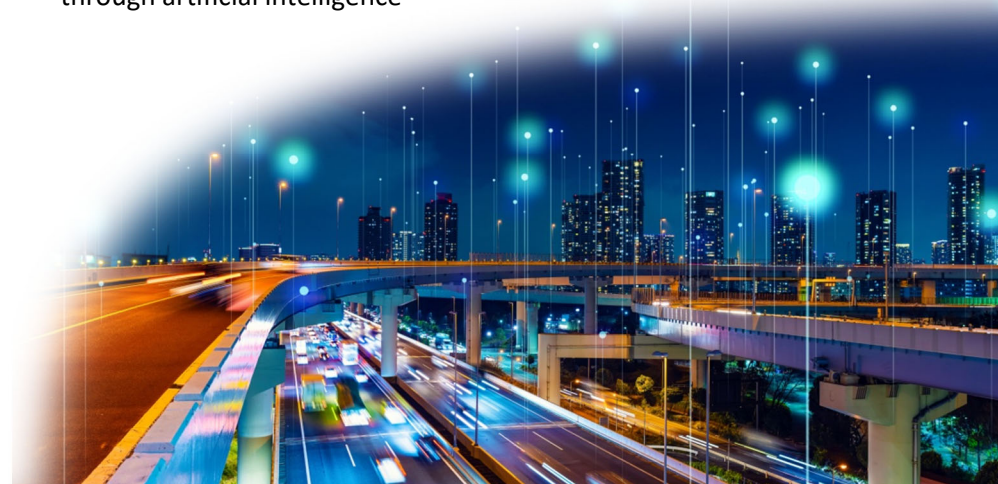☎ +34 934 017 348
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The sixth generation (6G) of wireless communication technology is touted as an enabler of our digital age. It bears vast potentials for individuals and businesses to enhance opportunities and create new technologies in a wide range of sectors, including industrial manufacturing, energy supply, digital healthcare, government and education, and efficient transportation.

AI-Enhanced Fiber-Wireless Optical 6G Network in Support for Connected Mobility

6G-EWOC contributes to this mission through its focus on autonomous driving. By connecting vehicles and making their collected information instantaneously available to all traffic participants, 6G provides a salient feature for safety and efficient transport on the road. 6G-EWOC contributes critical technologies:

- Optical wireless comms & sensing for situational awareness & connectivity
- Seamless access to edge datacentres through a high-capacity fiber fronthaul
- Real-time processing of the collected road-side data
- Orchestration of several constituents of 6G-enabled vehicular connectivity through artificial intelligence

6G-EWOC's MISSION

Road safety is a primary concern of the modern society as accidents cut short the lives of approximately 1.2 million people every year. Moreover, road traffic injuries remain as the leading cause of death for children and young adults and are responsible for a large number of non-fatal injuries, many of them incurring disability. Automated driving, enabled through instantaneous access to information for sharpening the situational awareness, can mitigate this toll on our society while enhancing the efficiency for transporting humans and goods.

To master this challenge, a large volume of information needs to be curated and made available to all traffic participants. This necessitates an upgrade of today's information networks, through inclusion of precise sensors, seamless connectivity at low latency, and a powerful compute infrastructures to fuse, in real time, the vast amounts of data generated along the roadside scenery.

Under this paradigm of a "connected mobility", photonics plays a key role by virtue of its bandwidth and efficiency offerings. 6G-EWOC will develop the key components concerning high-accuracy light-based sensing, high-bandwidth wireless optical access, high-capacity fronthauling through fibre-based access, and high-end datacentre technology. While this quiver of 6G technologies is highly heterogeneous, its efficient interplay will be ensured through the involvement of artificial intelligence in the overall orchestration of the 6G network.
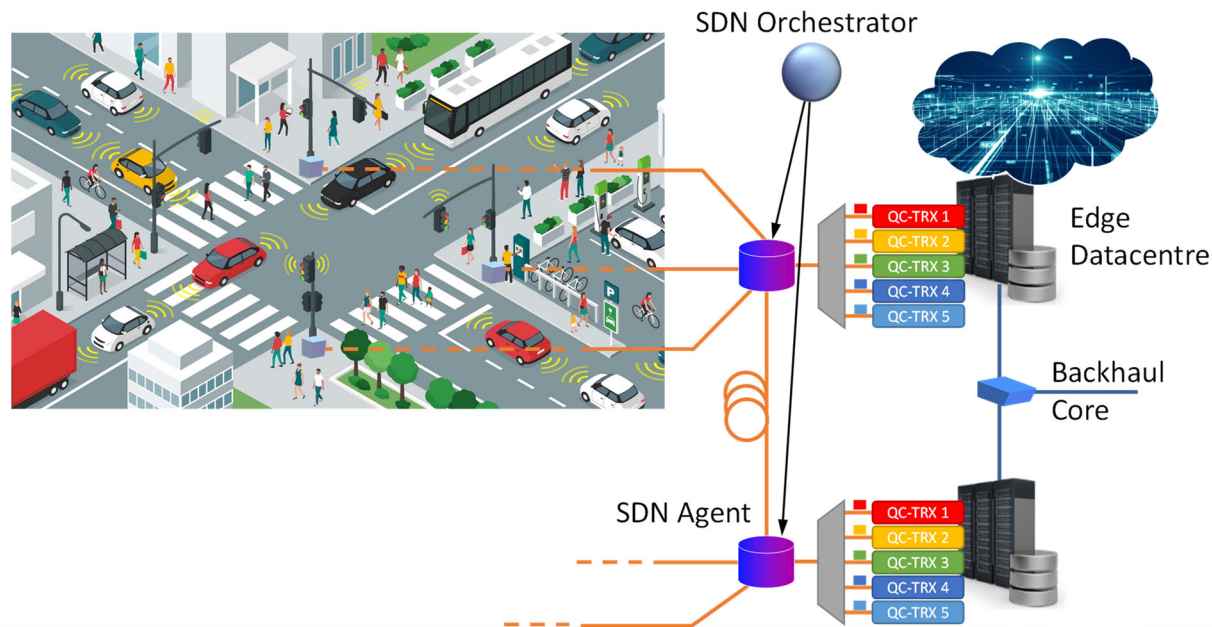
OUR OBJECTIVES

1 Optical wireless communication for vehicle-to-vehicle and high-rate vehicle-to-infrastructure applications, leveraging chip-scale optical beamformers

2 Efficient deployment of low-complexity connected laser/radio detection, ranging and communication (LiDAR/RaDAR) technology

3 Development of photonic integrated circuit (PIC) and electronic ASIC technology supporting high-capacity fronthaul enabled through quasi-coherent reception

4 SDN supporting the programmability of a flexible fronthaul network in connected mobility scenarios and intra-datacenter networks.

5 AI-assisted control and orchestration of network resources in the 6G-EWOC architecture

6 AI-based applications for autonomous vehicles employing multiple sensor technologies