6GSNS

Open Calls – Results
IMAGINE-B5G Project

5 Imagine
B5G

SUMMARY OF EXPERIMENTS AND IMPLEMENTATIONS

Results Achieved by 3rd Parties involved in 6G SNS Projects through the mechanism of Cascading Funding – Open Calls

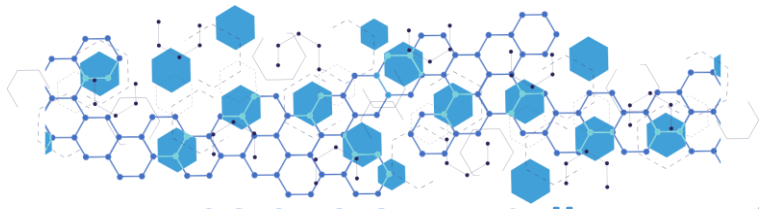**6G SNS Open Calls – Results**

SUMMARY OF EXPERIMENTS AND IMPLEMENTATIONS

Results Achieved by 3rd Parties involved in 6G SNS Projects through the mechanism of Cascading Funding – Open Calls

IMAGINE-B5G PROJECT

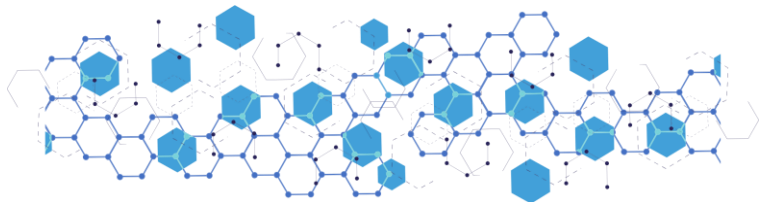Advanced 5G Open Platform for Large Scale Trials and Pilots across Europe

OVERVIEW

IMAGINE-B5G (Advanced 5G Open Platform for Large Scale Trials and Pilots across Europe) is an SNS Phase-1 Stream-D project, which aims to implement an advanced and easily accessible end-to-end (E2E) B5G platform for large-scale trials and pilots providing a set of B5G applications, enabled by the integration of advanced 5G disrupting technologies. The IMAGINE-B5G project aims to build an advanced, easy-to-access, secure, and programmable end-to-end (E2E) beyond 5G (B5G) platform to fill in the gap between the B5G market expectations and the capabilities of existing 5G-PPP infrastructure projects.

IMAGINE-B5G Facilities: The platform is composed of four advanced 5G experimental facilities, located in Norway, Spain, France, and Portugal, respectively. The goal of IMAGINE-B5G facilities is to contribute to the availability of resources and a conducive ecosystem for experimenting with innovative advanced 5G features within B5G use cases. Although all facilities provide 5G and B5G services, they each use different technology solutions, which lead to different ways of building, deploying, managing, and operating their 5G networks. For example, the French and Portuguese facilities are specialized in open-source solutions for trials of advanced features while other facilities provide near-commercial solutions for large-scale trials.
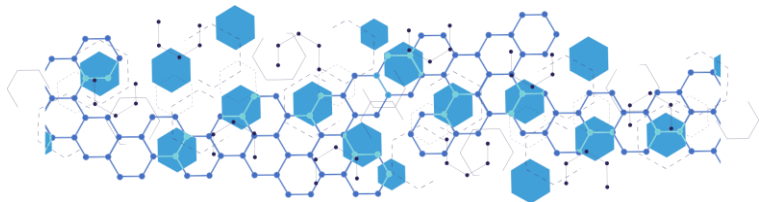
IMAGINE-B5G Open Calls: The IMAGINE-B5G platform is continuously evolving, associated with three platform releases, each of which was accompanied by the addition of advanced 5G and B5G features. With well-defined APIs, Open Callers have onboarded their applications and validated their specific KPIs and KVIs in one of the IMAGINE-B5G facilities. The platform evolution was also accelerated by the 8 Open Call projects that contributed platform extensions over the first two Open Calls and co-creation of innovative use cases.

In addition, advanced 5G networks are significantly changing the landscape of various industries and verticals, enabling the creation of efficient and scalable new solutions and products. To this end, IMAGINE-B5G funded 37 Vertical experiments, across a wide range of vertical industries.
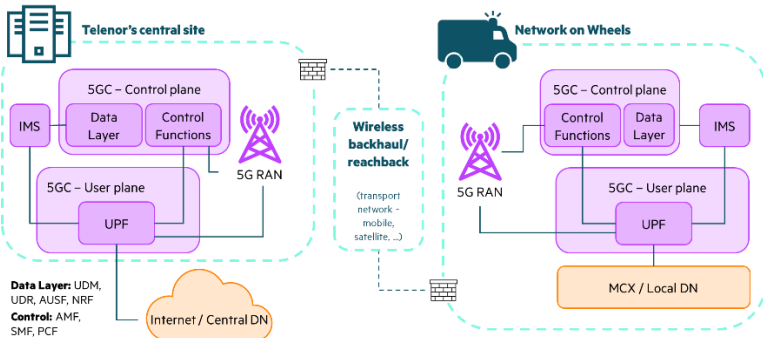
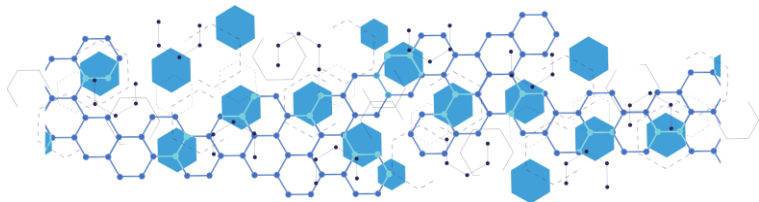| Vertical	Open Call projects
PPDR	OC1: ADAPT-G, SAFER-FLOW; OC2: RESCUE-5G, FIRESCAN, FORGuardian, CRITICAL; OC3: 5G-FIRE, AIRWAY, ABYSS-5G
Education	OC1: DEMOCRATS; OC2: SIMONE, VM4Academia; OC3: HoloMEd
eHealth	OC1: LEOSED, DCA; OC2: CogNetCare, CHHA, CRITICAL; OC3: 5G4Reha
Industry 4.0	OC1: ALMA, ULTRA-FAB5G; OC2: 5G-SEDAR, 5G-VirtuFix, OC3: SCANNER, NEURONET, PULSE-5G, WINGS
Media	OC1: PROSE-Serv, DEMOCRATS; OC2: Ntour-XP; OC3: 5G-PACE, Holo-MEd
Smart-Agri Forestry	&OC1: AI4FS, AGRO4-5G, OC2: FI-VEG, OC3: OPS-5G
Transport Logistics	&OC3: 5G-EVER, SMATRA-5G, PORTSAFE-B5G, ADS-5G

The outcome of the vertical experiments running on the IMAGINE-B5G platform has helped the project to gain a better understanding of the social implications of the proposed B5G solutions. As a result, society will be able to optimize the strategy and roadmap of adopting B5G into business and society development. The following sections detail some of the results of the 45 funded Open Call projects (8 Platform extension projects and 37 Vertical experiment projects).
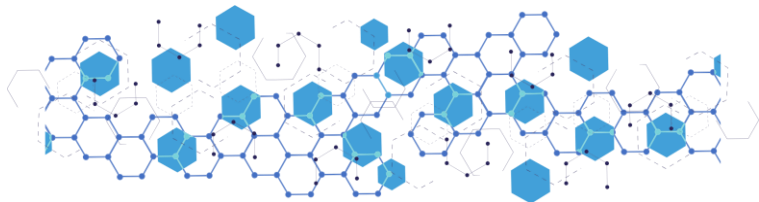
OPEN CALL 1

5G-NEPTUNE

OC Project Title	5G-and-beyond Network Extensions towards Public neTwork integrated non-pUblic NEtworks
Benefiaciary(s)/ Country	Hewlett-Packard Italiana S.r.l. (HPE)/Italy
Project Description	Extension of the IMAGINE-B5G Norwegian facility: i) installation of a 5G Core network (5GC) at Telenor's Experimentation Platform; ii) upgrade of the existing 5GC over IMAGINE-B5G's Network on Wheels 1 (NoW 1); iii) installation of IP Multimedia Subsystem (IMS) in both 5GC instances. 5G-NEPTUNE focuses on solutions to integrate NoW 1 with Telenor's Experimentation Platform towards a Public Network Integrated NoW (PNI-NoW). 5G-NEPTUNE includes trials of the PNI-NoW in collaboration with Public Protection and Disaster Relief (PPDR) stakeholders (the Norwegian Defense Material Agency and the Norwegian Police IT Department).
Vertical	The platform extension is vertical agnostic per se. In 5G-NEPTUNE, the platform has been tested for PPDR use cases.
Testbed	Two-site 5G network architecture. Each site can operate independently. In particular, the NoW is a moving 5G bubble, providing 5G services and local access to mission-critical applications. When wireless backhaul is active between sites, the overall infrastructure operates as a single network, and users get access to data networks independently from their location.
Implementation timeframe	January 2024 – June 2025.
Results & Impact	The platform extension was carried out as planned. Trials with PPDR stakeholders have involved up to 55 users simultaneously. Communications happened over a 20-MHz bandwidth (2300-2320 MHz) within band N40, kept as reduced as possible to test possible congestion or communication delays. Traffic was monitored via Wireshark and MRTG. The 5G network performed well. MC-PTT services required approximately 270 kbps per session per user.

ADAPT-G

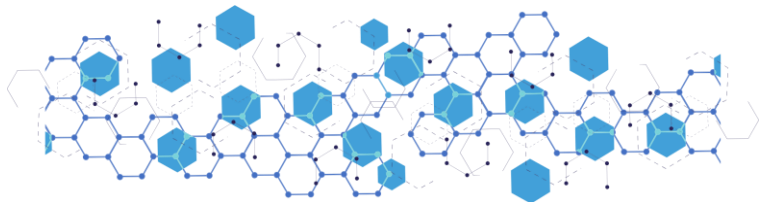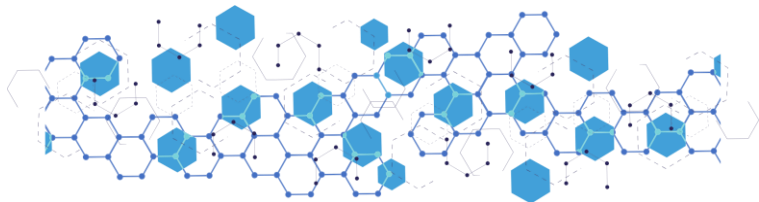|	
OC Project Title	Advanced Drone-Assisted Port Technology with Augmented Reality and 5G Communications
Benefiaciary(s)/Country	ETRAIR /XRF; Spain
Project Description	ETRA AIR and XRFactory initiated a collaboration in the pursuit of the "ADAPT-G" project, with a strategic focus on revolutionizing port surveillance and operational efficiency at the esteemed Port of Valencia. Merging our technologies, including drones, augmented reality (AR), and 5G communications, the project endeavors to establish an advanced port monitoring system.
Vertical	PPDR. Ensuring the safety and well-being of the public in times of crisis through effective protection and relief efforts.
Testbed	Port of Valencia
Implementation timeframe	1st October 2024- 1st October 2025
Results & Impact	The experiment fulfilled the following objectives: Surveillance system combining drones, AR devices, and 5G communications. Optimization access verification thought high-resolution drones equipped with advanced cameras. Integration of the drones with the XRSandbox platform. This integration allowed operators to remotely control and operate the drones, access live video feeds, and interact with the XR environment for enhanced situational awareness. With Video Analytics and AI algorithms, the experiment detected unauthorized intrusions into restricted areas within the port premises. Upon detection, drones were quickly dispatched to closely track and monitor intruders. Leveraging the high-speed and low-latency capabilities of 5G networks, the experiment ensures seamless real-time communication between drones, the Video Analytics platform, and XR devices.

AI4FS

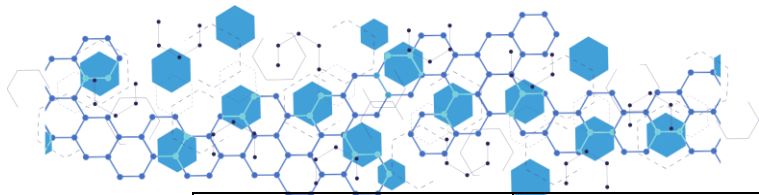| OC Project Title	Artificial Intelligence for Forest Surveillance
Beneficiaries/Country	ILINK NEW TECHNOLOGIES (1), LOCAL-AI (2) [Greece]
Project Description	AI4FS pilot was developed to improve forest monitoring operations by providing a platform for advanced data analytics. UAVs and IoT sensors have been utilized for data collection, including environmental metrics, RGB, and multispectral images. On top of this, we have utilized Computer Vision (CV) models to implement tree-counting for the periodic monitoring of the forest density. The Normalized Difference Vegetation Index (NDVI) provided data for further analysis regarding the tree's health. The overall data pipeline has been based on 5G technology, aiming to decrease latency and provide sufficient bandwidth.
Vertical	Local Authorities, PPDR, Forest Surveillance stakeholders
Testbed	Telenor, Jaren Forest
Implementation timeframe	1 November 2024 to 1 November 2025
Results & Impact	The AI4FS pilot successfully demonstrated a robust, AI- driven forestry monitoring system that leverages 5G connectivity, edge computing, UAVs, and IoT sensors for real- time environmental surveillance. Key outcomes include high-performance KPIs such as downlink throughput of 695 Mbps, latency as low as 15 ms, and model inference times below 2 seconds. The fire/smoke detection model achieved an impressive 98% accuracy, while the overall CV model exceeded the 80% performance threshold. These results confirm the system's operational reliability and responsiveness. The impact spans across multiple verticals, particularly forestry and agriculture, enabling early fire detection, optimized forest thinning, and precision vegetation health assessment through NDVI. Furthermore, the solution contributes to societal and environmental goals by improving response times, reducing greenhouse gas emissions, and minimizing energy consumption in remote monitoring operations. Overall, AI4FS has reached TRL 7 and lays a strong foundation for future adoption and scaling across Europe.

ALMA

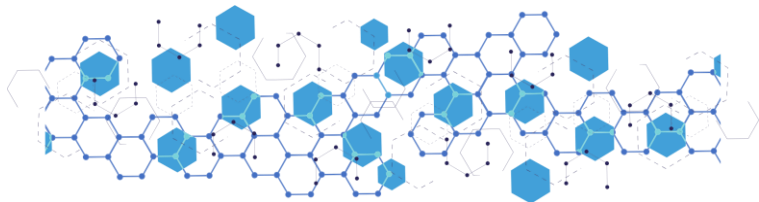|	
OC Project Title	5G-enabled AI gloves as Industry 4.0 IoT sensor of human activity ALMA (Ai gLoves huMan Activity)
Benefiaciary(s)/Country	Mimetik GmbH, Germany
Project Description	Mimetik integrated the solution for the training of blue-collar workers in a realistic Industry 4.0 environment, which contains a 5G network and on-premise cloud. Mimetik smart gloves are used by workers. They measure the hand motion and send it to a backend server. Mimetik data gloves have been equipped with 5G in the course of this project.
Vertical	Vertical Experiments: Industrial Innovation
Testbed	-
Implementation timeframe	2023/11/01 - 2024/10/30
Results & Impact	Mimetik used the fully functional prototype that was available at the start of the project, which had wifi for communication with a backend server. During the project, Mimetik added a 5G capability and tested the full system with resources available at the IMAGINE-B5G facility in Norway. Mimetik added 5G in two stages: 1) using a smartphone as a bridge between wifi and 5G, 2) replacing wifi with 5G on the glove. Mimetik conducted two trials in Oslo, Norway, together with UiO and Telenor, and one trial at Malaga, Spain, together with KeySight.
	It has been proven with the trials that a communication of Mimetik gloves is possible through a private 5G network. This allows Mimetik to demonstrate a case study to Mimetik customers and use their 5G private network infrastructure. The usage of 5G private network in the 3rd trial demonstrated sufficient communication quality for over 150 Mimetik gloves active in the network at the same time and utilising the same 5G core.
	The results of this project allow Mimetik to effectively increase the number of potential users by 310%. This will include the customers with numbers of employees >1.000. The usage of 5G also improves environmental sustainability. In comparison to wifi, 5G allows an increase in the ratio of services delivered per energy unit and a decrease in CO_2 emissions for a service load.

DCA

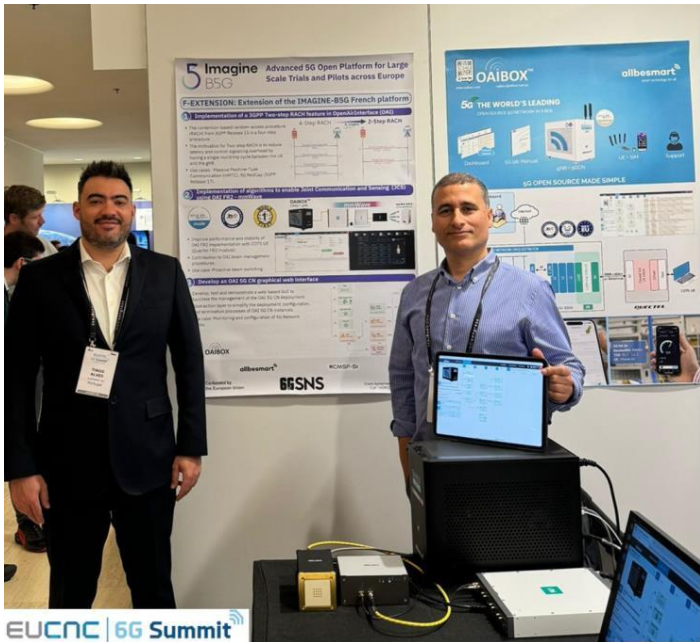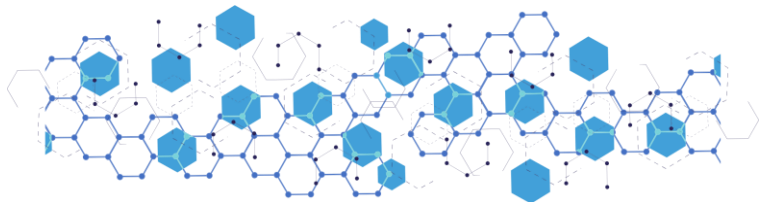| OC Project Title	Mobile health monitoring as a service enabled by beyond 5G
Benefiaciary(s)/Country	LOAD and IPN
Project Description	This project validates beyond 5G features for a Drone Care Angel (DCA) service, focusing on the real-time health monitoring of individuals on the move. This novel service was enabled by the transmission of a richer amount of information collected and aggregated by a drone, while tracking a person, with the support of additional data collected via available Internet of Things (IoT) devices (e.g., video, health sensor data). Upon identification of health-impacting incidents (e.g., heart attack, robbery attempts), a top data tier was activated to enable a perception of the scene via the increase of volume, complexity and/or richness of transmitted data (e.g., additional data sources, increased video resolution or derived Augmented Reality (AR) elements).
Vertical	Vertical Experiment eHealth
Testbed	IT Aveiro, Portugal
Implementation timeframe	Nov. 2023 – October 2024
Results & Impact	The demonstration took place at Jardim Oudinot and was attended by the Deputy Mayor of Ílhavo Municipality and the Municipal Civil Protection Coordinator of Ílhavo. LOAD presented its DCA solution, where the health of a person in motion can be monitored by a drone with a high-resolution camera. If any health anomaly is detected, a medical assistance team can be informed through an IoMT application with IR supported by AI techniques. This team can visually monitor the scene in real-time by observing the image in AR, which graphically highlights the areas of the affected person's body, as well as their vital data, and thus decide the best approach to take while moving to the location to assist the patient.
	The impact at the technical level: Drones need stable, high-quality connections for remote visualisation of transmitted data. The associated AI-based IR module significantly benefits from edge processing for reducing data transmissions to the stream's recipient, while the AR module requires seamless real-time data streaming to ensure QoE. These trials validated the MEC components deployed in the Imagine-B5G infrastructure and their impact on healthcare scenarios; at the same time showing that 5G/6G networks can meet the demanding technical requirements of these applications, validating their readiness for such scenarios - They will also aid in identifying the main difficulties faced from the perspective of vertical application providers, collectively contributing to identifying research directions for future 6G specifications.

DEMOCRATS

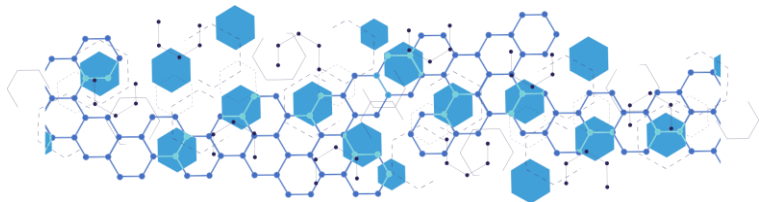| OC Project Title	eDgE platforM fOr dynamiC xR applicATionS
Benefiaciary(s)/Country	HUN-REN TKI / Hungary
Project Description	XR applications with a new level of immersive interactions enable a new generation of applications in many fields. However, the required quality of user experience poses several challenges. In this project, we deploy our novel edge/cloud-based XR platform into the IMAGINE-B5G infrastructure, where resource-intensive tasks are offloaded to the edge, while delay-critical tasks are executed on the head-mounted display. The deployed use case is a multi-player car soccer game, where small real remote-controlled cars, detected/tracked in real-time, play with a virtual ball, achieving true XR in which virtual and real elements are presented to the user and interact with each other. Real-world experiments were conducted and analyzed regarding KPIs and user experience in different network scenarios.
Vertical	Media (XR gaming) / Education
Testbed	Spain, UPV Campus
Implementation timeframe	1/11/2023 – 31/10/2024
Results & Impact	The results were summarized in a joint paper presented at ACM MMSys'25. We have analyzed the operation of the XR platform in different scenarios, revealed the impact of congestion in the radio access network and evaluated mitigation techniques at the network level (slice prioritization) and at the application level (dimensioning of a jitter buffer). Besides, the QoE has also been assessed via real-life experiments conducted as part of a student competition. We found that the remote-rendered video stream has the greatest impact on the user experience. The results show that the latency and jitter characteristics can be managed efficiently together by slice prioritization and a dynamic jitter buffer in the application.

F-EXTENSION

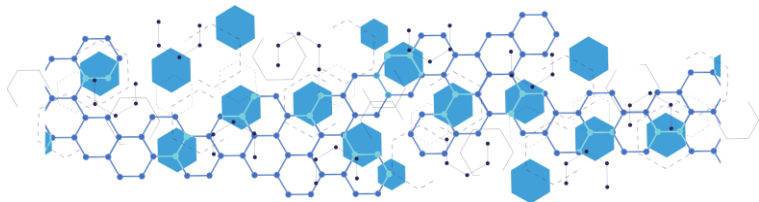|	
OC Project Title	Extension of the IMAGINE-B5G French platform
Benefiaciary(s)/Country	Allbesmart Lda, CMSF-Sistemas de Informação Lda / Portugal
Project Description	The F-EXTENSION OC project implements three extensions of the IMAGINE-B5G French Platform at Eurecom: 1.Implement a 3GPP-compliant Two-step RACH feature to support Short Data Transmission (SDT). 2. Implement algorithms to enable Joint Communication and Sensing (JCAS) using OpenAirInterface (OAI). 3. Develop an open-source graphical web interface for the OAI 5G CN that allows deploying, configuring, and terminating CN instances.
Vertical	IoT and JCAS applications
Testbed	French Platform
Implementation timeframe	18 months from November 2023 to April 2025
Results & Impact	This OC project resulted in the development of two new products, expanding the OAIBOX (www.oaibox.com) product line: the OAIBOX mmWave and the OAIBOX 5G RedCap. A project demonstrator was presented at the EuCNC & 6G Summit held in Antwerp from 3 to 6 June 2024. Figure 1 Project demonstration at EuCNC & 6G SUMMIT, Antwerp, 3-6 June 2024 (Tiago Alves left and Paulo Marques right).

LEOSED

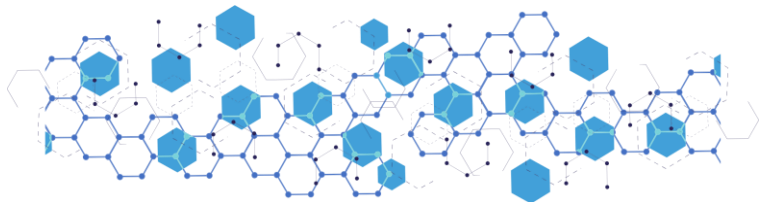|	
OC Project Title	Leveraging Edge Optical Sensing for Emergency Diagnostics
Benefiaciary(s)/Country	Germany
Project Description	LEOSED achieved remote patient care support in B5G/6G system at minimal cost per intelligent sensing device. The sensed data are postprocessed through the Optical wireless sensing of pulse and blood oxygen saturation (OWSPOS) algorithm in real-time, and the results of the health monitoring are visualized back to the client end point.
Vertical	eHEALTH
Testbed	The physical environment contained the wheeled stand with the mobile client to simulate a waiting room or a resting space for patients. A single client station should allow for the inclusion of the stand containing the sensing equipment, the chair, at ideally a distance of 1-1.5m between both. The patient initiates the experiment, stands still for several second, and observes the results on the touchscreen.
Implementation timeframe	12 months
Results & Impact	The final network measurements reported a stable capacity of the 5G RAN of 179Mbit/s in uplink, with an average RTT latency of 13.8ms. Under this network KPIs, The final error measured by our OWSPOS algorithm was an average of 5 beats per minute for the heartbeat and 1% error for the oxygen saturation. Compared with a monolithic implementation, no difference of precision was measured, showing the potential of B5G for eHealth traffic. To take a single OWSPOS measurement of the testbed needed between 22-25 seconds.

Prose-Serv

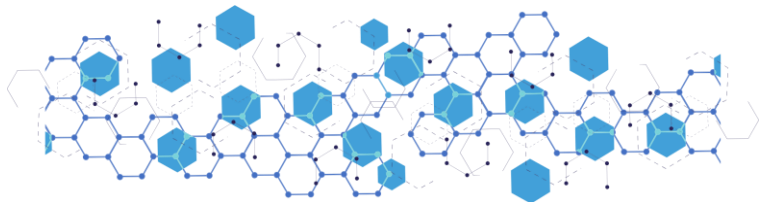| OC Project Title	Prose-Serv
Benefiaciary(s)/Country	Hopcast, France
Project Description	The ProSe-Serv proposal targets the first topic of the Open Call #1 "to test and validate novel vertical applications", focusing on "Vertical Experiments: Scientific Excellence". At Hopcast, we have been developing, implementing, and testing cutting-edge orchestration solutions tailored for content distribution through efficient mobile data offloading strategies. Our focus extends beyond traditional boundaries, pushing the concept of far-edge orchestration all the way to User Equipment. We believe that IMAGINE-B5G stands to gain significantly from Hopcast's vision, particularly in enhancing the use of proximity services that empower User Equipment to seamlessly support a variety of services. Basic communication services, highly popular on smartphones, leverage technologies such as Apple's Multipeer Connectivity and Google's Nearby Connections. These technologies form the underlying frameworks for well-known features like Apple's AirDrop and Android's Nearby Share. While current services are relatively straightforward, we anticipate that more advanced and sophisticated services will emerge in the near future, with the communication dimension evolving into a mere enabler. Despite being acknowledged by 3GPP, proximity services are not yet widely deployed in the cellular context, likely due to historical market size constraints. However, we are confident that they will play a pivotal role in 6G networks. Various indicators, including considerations of carbon footprint, inclusiveness, and cost-effectiveness, underscore the growing importance of proximity services.
Vertical	Vertical Experiments: Scientific Excellence
Testbed	Eurecom, France
Implementation timeframe	Nov. 2023 – October 2024
Results & Impact	Integration of Prose-Serv orchestrator in Eurecom's edge network and use of NWDAF for users location. Hopcast's content distribution app has been tested. We have demonstrated the ability to establish D2D communications with an integration in a 5G core network. The experiment showcased how advanced D2D communication and edge orchestration can scale across a diverse 5G infrastructure, enhancing service resilience in fluctuating network environments.

AGRO4-5G

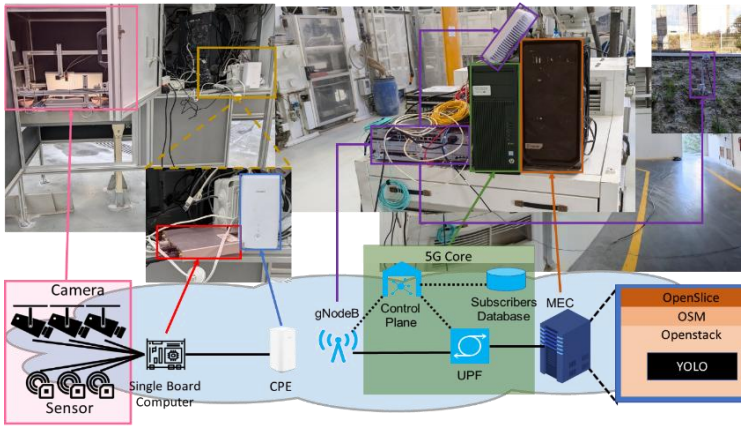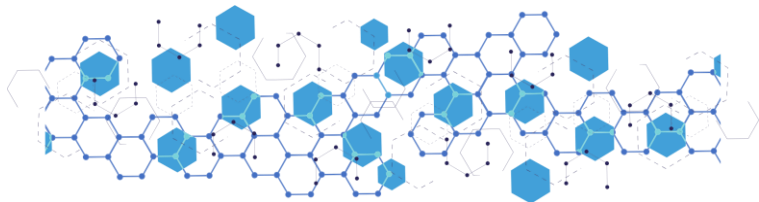| OC Project Title	Agro-4.0 based on 5G
Benefiaciary(s)/Country	Spain
Project Description	The aim of the test is to verify the feasibility of using 5G technologies in agriculture IoT deployments. through the combination of different data sources. QAMPO works by combining data from sensors and stations installed on a plot, with data from climatic stations, soil analysis data and satellite images. This data is processed together to provide it with a context and provide notices and recommendations that allow the farmer to make the right decisions on time.
Vertical	Smart Agriculture
Testbed	Matanza-de Soria (Spanish facility) Puerto de Valencia (Spanish Facility) Universidad Politecnica de Valencia (UPV) (Spanish Facility) NOKIA- Maria Tubau (SPanish Facility)
Implementation timeframe	Start: Dec-23 End: Oct-24
Results & Impact	 An important conclusion considering the power consumption is that the average power consumption of the whole communication system could be reduced in a factor of 15 to 20 times. Productivity increment along 2 campaigns: It is not possible to determinate that in the time frame of the vertical experiment OC1. But in our experience, an average grower, for the mere fact of measuring, improves 10% the productivity. Energy and water usage reduction along 2 campaigns: There are big differences in water requirements, depending on the type of crop, the geography and the regulation. We could conclude that approximately: 1 KWh of 5G saved = 1.27 million liters of water saved.

SAFER-FLOW

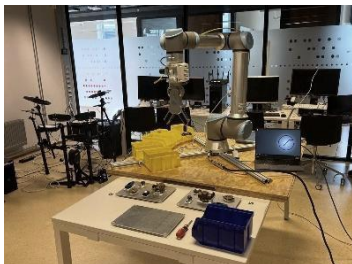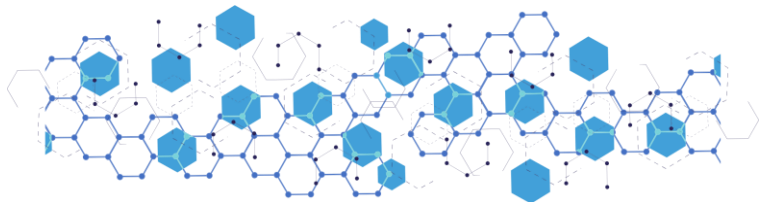|	
OC Project Title	Situational Awareness Framework Enabling Robust Emergency Response for Urban Flood Warnings
Beneficiary(s)/Country	ONESOURCE, Consultoria Informática Lda. / Portugal
Project Description	SAFER-FLOW enhances Public Protection and Disaster Response (PPDR) for urban flood emergencies by integrating advanced beyond 5G technologies. Piloted in Aveiro, Portugal, it includes real-time water level monitoring, drones with live video and AI-assisted mapping, wearable devices for first responders with biometric/environmental sensing, AR-assisted navigation, and centralized Command and Control Centre (CCC) interface. The platform leverages the IMAGINE-B5G infrastructure for ultra-reliable, low-latency communications and edge AI/ML processing.
Vertical	Public Protection and Disaster Response (PPDR)
Testbed	Portuguese IMAGINE-B5G Facility, primarily in the Aveiro urban flood-prone areas
Implementation timeframe	12 months (01/09/2023 – 31/08/2024)
Results & Impact	SAFER-FLOW validated a complete flood response solution by integrating beyond-5G technologies in real-world trials in Aveiro, Portugal. The platform combined IoT water sensors, drones with multispectral imaging and AI mapping, biometric wearables, and AR glasses, all connected to a 5G-enabled CCC. Collaboration with the Ílhavo Municipality, Aveiro Port, and the Portuguese National Authority for Emergency and Civil Protection was key to adapting the system to real operational needs. Their input shaped the platform's features and confirmed its relevance for first responders and local authorities. The solution successfully achieved its key performance indicators, including low latency below, high throughput, and near perfect AI accuracy. Stakeholder engagement and feedback not only enhanced the system's usability but also proved essential in shaping business strategies and ensuring acceptance and scalability of the platform and B5G technologies in real-world applications.

ULTRA-FAB5G

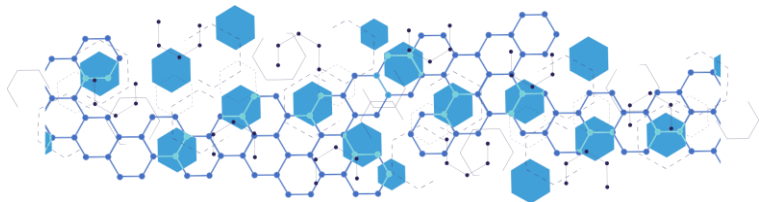|	
OC Project Title	Ultra-Low Latency M2M communications for 5G enabled Fabrication Systems "ULTRA-FAB5G"
Benefiaciary(s)/Country	Portugal
Project Description	The objective of ULTRA-FAB5G was to assess and validate a comprehensive Industrial shopfloor-centric private 5G communications network layer. The implementation was initially validated in a lab environment and progressed to an industrial site implementation in the second and final phases. The ULTRA-FAB5G PoC demonstrated that a dependable, secure, low-latency 5G communication framework can eUectively replace legacy wired cable systems-based communication networks on the shop floor.
Vertical	Riastone
Testbed	Portuguese Facility with installation on Riastone for final trial
Implementation timeframe	The ULTRA-FAB5G open call started on 1/11/2023 and ended on 31/10/2024
Results & Impact	The final deployment, as represented in the figure, was performed on the Riastone Factory Floor, and the deployment consisted of the following: • Open 5GS core • 5GAiner RAN solution • PC to process images, used as MEC. • CPE providing 5G connectivity to the end device. • A single-board computer, as an end device, is connected to the cameras and sensors inside the QCP. The final trial, conducted at the Riastone factory, lasted a week and was integrated into the production line, achieving a Technology Readiness Level (TRL) of 7. This demonstrated the viability of using a 5G network in industrial processes. During experimentation and evaluation, a gap was identified related to the equipment release available. The network was restricted to R16, with a few R17 features, and end devices only supported R15. Even though this limitation restricted the KPIs achieved, the final results were highly satisfactory. A second trial is planned for future work with end devices supporting R17.

OPEN CALL 2

5G-SEDAR

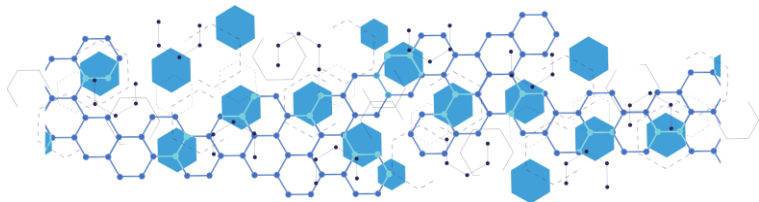|	
OC Project Title	5G Sensor Platform-Enabled Dynamic AR Assistance for Enhanced Manufacturing
Benefiaciary(s)/Country	HUN-REN SZTAKI (Hungary), MM-VILL Kft (Hungary)
Project Description	5G-SEDAR uses an AR assistant to enhance human-robot collaboration in assembly scenarios. A wireless 5G sensor platform captures the work cell to identify parts and guide users. The project ensures efficient, cable-free operation, validated via mental stress assessment and network measurements.
Vertical	Industrial Innovation
Testbed	Norwegian Facility
Implementation timeframe	12 months duration
Results & Impact	The proposed vertical experiment encompasses the following results: • Development of a novel wireless, 5G sensor platform for robotic arms to remove excessive wiring and ensure smooth communication. • Integration of augmented reality (AR) and machine learning (ML) to guide human operators in collaborative assembly and disassembly tasks. • Validated AR assistance through both objective (electrodermal activity) and subjective measurement (questionnaire) types ensuring human-centered design and usability. • Demonstrating setup flexibility by recreating the robot cell in both Hungary and Norway in different environmental conditions. • Tests on 5G's low-latency, high-reliability performance over traditional network setups. The first version of the 5G sensor platform is functional and the ML algorithm was tested in both countries. For further enhancements, the database for parts' recognition was extended. The progress of the project will be presented at the Hungarian NETWORKSHOP conference in May, while the pre-experiment of the final setup will be carried out in June at the Norwegian facility. Robot cell setup in Hungary Robot cell setup in Norway

CHHA

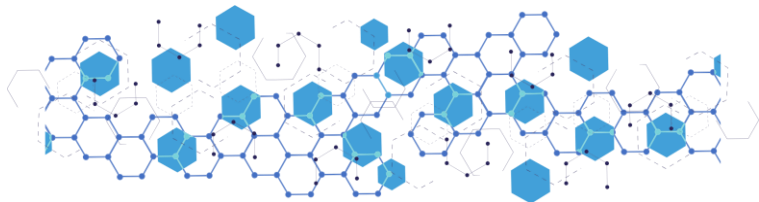| OC Project Title	Connected Home for Healthy Ageing
Beneficiary(s)/Country	University of Aveiro, Portugal
Project Description	CHHA is pioneering solutions for independent living of older adults. Through **5G-enabled smart homes,** CHHA project is developing: • **A Gamified Virtual Gym** to boost exercise adherence and reduce loneliness. • **Activity Monitoring** to detect changes and enhance prevention and care.
Vertical	Health
Testbed	The experiment is conducted on the IMAGINE-B5G Advanced 5G Open Platform Portuguese facility.
Implementation timeframe	2 January 2025 to 30 September 2025
Results & Impact	By integrating innovative eHealth use cases with cutting-edge network services, the project fosters healthier, more connected lives for older adults, reducing healthcare costs through virtual exercise and activity monitoring, while enhancing independence. We completed functional prototypes with the essential functionalities to enable initial performance tests of the two scenarios, planned for May. For both, backend services were deployed on remote VMs (at the facility). The prototype system for the Gamified Gym, illustrated in the Figure, consists of: (1) a client running locally including capture of video from high definition camera(s); (2) transmission using WebRTC; (3) reception of frames by a remote service; (4) processing of images by media pipe to extract the skeleton; (5) transmission of the results to the client; (6) display of information to the end-user. Timestamps of several of the processing steps are saved for assessment purposes (A to F in the Figure). The Activity Monitoring prototype has a similar flux, the video capture and images replaced by radar(s) and the data captured by the radar(s), respectively. In preparation for the first trials to be performed in May, some informal tests were performed with non 5G networks and commercial 5G, resulting in initial estimates for latencies, throughput, and jitter. An example is included at the right of the figure. As planned, these tests will be replicated in May at the PT facility (Institute of Telecommunications Aveiro).

CogNetCare

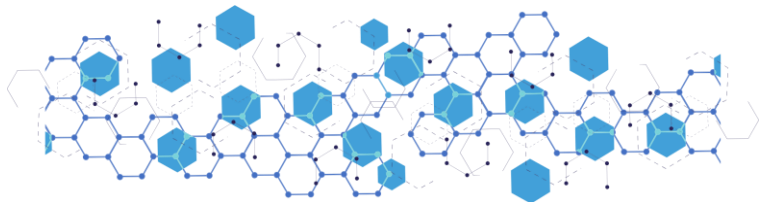|	
OC Project Title	Advancing Population Cognitive Health with 5G
Benefiaciary(s)/Country	Neuroinova, Lda / Portugal
Project Description	The CogNetCare project aims to integrate a comprehensive cognitive health solution enabling early risk detection and continuous monitoring of cognitive impairments outside traditional clinical environments. Leveraging advanced 5G technologies, the project combines Brain on Track (a medically certified serious games-based cognitive screening tool) and Neuro on Stride (a remote walking speed and motor control assessment solution). The goal is to ensure reliable, low-latency, and accurate cognitive and physical performance monitoring for individuals at risk of neurological disorders such as Parkinson's disease or stroke. The project will validate the adequacy of 5G networks for these clinical applications, focusing on reliability, latency, availability, bandwidth and positioning accuracy.
Vertical	Industrial Innovation / eHealth
Testbed	PT facility (Portugal), leveraging 5G infrastructure and B5G features
Implementation timeframe	01 October 2024 to 01 October 2025 We are now at M7 out of 12.
Results & Impact	Testing with the Brain on Track cognitive screening solution is currently ongoing. Several sessions have been conducted under different network quality conditions, including the use of a pre-loaded server and scenarios without resource transfer optimization (on-demand). These tests aim to evaluate the impact of network quality on cognitive performance assessment. The Neuro on Stride mobile application for gait and fine motor control monitoring has been fully developed, and initial testing is underway. In these tests, walking speed measurements obtained via GPS were compared with timings recorded using photoelectric detection cells, with preliminary results indicating good coherence between the two methods. By the end of the project, key expected impacts include improved access to early diagnosis and remote monitoring for patients with neurological disorders. The integration of Brain on Track and Neuro on Stride offers a unique and competitive market solution for comprehensive cognitive health management, with strong potential for large-scale adoption across Europe.

FIRESCAN

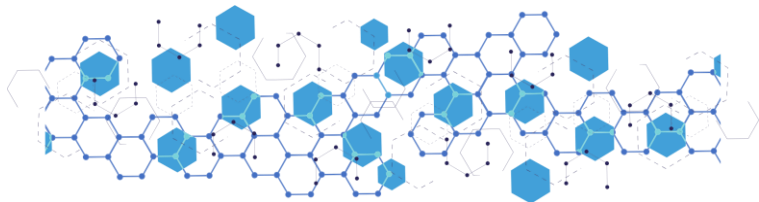| OC Project Title	Forest Incident Response and Emergency Security Coordination And Networking
Benefiaciary(s)/Country	MidGard - France
Project Description	MidGard is collaborating with Airbus to integrate its FireGard and SitGard systems with the AGNET communication platform, aiming to enhance firefighting operations and forest monitoring. FireGard uses AI for real-time fire surveillance across 2 million hectares in France, and its integration will enable instant fire alerts and live video transmission to firefighters. SitGard, which provides live drone video and GPS data, will also connect to AGNET, improving location tracking and crisis coordination. This initiative, leveraging beyond 5G capabilities, will boost communication, operational efficiency, and strategic decision-making for emergency response teams.
Vertical	
Testbed	French Facility
Implementation timeframe	12 months
Results & Impact	The integration of FireGard with AGNET has been successfully completed, enabling the direct transmission of fire alerts to AGNET devices. This achievement marks a major milestone in enhancing the speed and reliability of fire detection and response coordination. The integration will soon undergo operational testing at a French facility, which will validate the system's performance in real-world conditions. This collaboration is expected to significantly strengthen emergency communication networks, improve situational awareness for firefighting teams, and contribute to faster, more effective interventions in critical situations.

FI-VEG

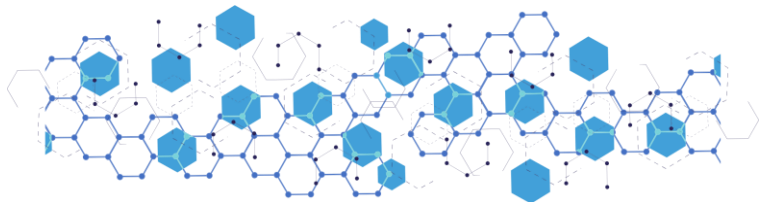| OC Project Title	Phenology and Innovation for Vegetation
Benefiaciary(s)/ Country	Instituto Tecnológico Agrario de Castilla y León (ITACyL) Spain
Project Description	The FI-VEG project integrates 5G technology with real-time sensing and analysis in agriculture to enhance precision and efficiency in crop monitoring and management. This is achieved through three main components: - An IoT sensor network for ripening tracking to facilitate precise decisions - Pan-Tilt-Zoom (PTZ) sensors for phenological crop monitoring and wildlife and security management using AI via 5G connectivity. - Integration of cameras onboard Automated Guided Vehicles and Drones for real-time crop inspection for proactive field operations management.
Vertical	The project focuses on the agricultural sector, particularly the wine industry (viticulture), and the technological sectors of telecommunications
Testbed	The experiment is conducted on the IMAGINE-B5G Advanced 5G Open Platform at the Spanish Rural Site in Matanza de Soria (Soria). This site is equipped with different Radio Access Technologies (RATs) and independent 5G Cores with end-to-end network slicing capabilities. The site is ideal for testing in isolated agricultural areas using private 5G infrastructure and for its potential for cultivating high-quality grapes due to favorable microclimate, altitude, day-night temperature fluctuations, and age of vines.
Implementation timeframe	The expected duration is 12 months aligns with the vegetative cycle of the vine, beginning in November 2024 and concluding in October 2025.
Results & Impact	By integrating these technologies through the 5G network, the project aims to transform the agricultural sector by improving data-driven decision-making. In particular: - Agricultural Sector: Potential for more efficient and sustainable viticultural practices, optimizing grape production and wine quality, mitigating climate variability challenges, improving mechanization, and enhancing profitability and sustainability of vineyards. Improved harvest precision by using real-time data among other uses. - Technological Sector (Telecommunications): Revolutionizing connectivity in rural/agricultural areas through 5G and IoT solutions, facilitating real-time data collection and analysis for improved decision-making. - Technological Sector (Precision Agriculture, Sensor Technology): Improving the accuracy, reliability, and accessibility of sensor technologies and data analytics for precise crop monitoring and management. - Broader Research Community: Sharing methodologies, findings, and data to foster collaboration, inspire further research to the collective knowledge. - Scalability: Potential to scale the experiment to other agricultural production areas with 5G coverage. Grape color sensors and PTZ cameras can be used in other vineyards or crops with 5G coverage - Key Societal Value: Promoting Economic Growth through increased productivity and optimized management, fostering Innovation by integrating advanced technologies.

FOR-5G

OC Project Title	FORestGuardian: 5G-powered Forest Firefighting and Surveillance System
Benefiaciary(s)/ Country	France
Project Description	FOR-5G tackles the critical challenges of forest fighting by uniting the expertise of Rinisoft (Bulgaria) who contributes mission-critical drones and Correlation Systems (Israel), and their innovative IoT sensors. The project leverages the 5G networks to deliver a comprehensive firefighting toolkit.
Vertical	PPDR
Testbed	EURECOM, French Facility
Implementation timeframe	12 months, from October 2024 to September 2025
Results & Impact	On April 25, 2025 we had the first trials at EURECOM facility (France) and got the following results: Test 1 – Connectivity. Eurocom provided two 5G modems and SIM cards, installed in the 5G controller and video wall system. After network activation, camera streaming and the people detection dashboard were successfully tested, showing reliable performance and smooth 5G integration. Test 2 – Performance. Using Eurocom's indoor 5G network, camera streaming and dashboard components were tested under normal conditions and performed consistently in all trials. Test 3 – Range. A continuous ping from the video wall system to the moving payload confirmed stable 5G connectivity across a 60-meter range, with no signal loss or latency, validating reliable communication throughout the tested area. Also we have tested SMAUG AI Software developed by Rinisoft to evaluate its fire and smoke detection capability over a 5G network as part of the For5G project. Test 4 - Network setup was completed without issues, confirming strong connectivity. Test 5 - Rooftop tests included controlled fires using dry alcohol. The video transmitted over 5g was successfully processed by the SMAUG AI software. After minor modifications the flames were successfully detected. Test 6 - A smoke bomb test confirmed the system's ability to detect non-flame smoke sources. A secondary fire test failed due to weather. SMAUG AI was applied on the video transmitted over 5G, smoke was detected.

FUSION

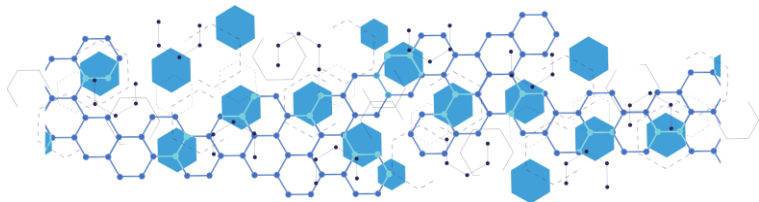|	
OC Project Title	A novel Framework for Unified Sensing, Insights, Observability and Networking
Beneficiary(s)/Country	Erevnitiko Panepistimiako Institouto Systimaton Epikoinonion kai Ypologiston (ICCS), Greece
Project Description	FUSION aims to design and implement an open-source observability and analytics framework that integrates diverse signals (i.e., metrics, traces, and logs). The framework will support efficient collection and analysis of heterogeneous data and expose the results through open Application Programming Interfaces (APIs). By applying various analysis pipelines to the fused data, FUSION will deliver advanced analytics, support mitigation strategies, and enhance orchestration mechanisms.
Vertical	N/A
Testbed	Norwegian Facility
Implementation timeframe	12 months, from October 2024 to September 2025
Results & Impact	FUSION extends the functionalities of the IMAGINE-B5G Norwegian facility. The developed framework leverages open-source tools (e.g., Prometheus, Grafana, Elasticsearch) and is published under a permissive free software licence. The first release of the platform extension has been completed and deployed at the Norwegian facility (see Fig. 1). *Figure 1: FUSION platform architecture* It incorporates the foundational tasks of setting up data collection mechanisms to handle heterogeneous data from diverse sources in accordance with the OpenTelemetry standard, aggregating this data into a unified schema, and implementing APIs to facilitate seamless data integration. It includes prototype AI-based analytics functions and components such as anomaly detection, and root cause analysis. Future development will focus on advanced reporting/visualization tools. To demonstrate real-world applicability, an Industry 4.0 robot-based application will be used. FUSION will help build trust in the IMAGINE-B5G facilities and drive adoption among SMEs, academia, and other users.

N-TOURXP-5G

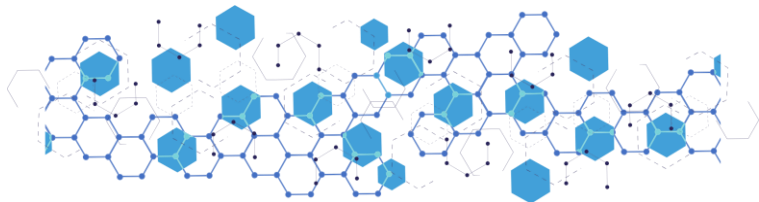| OC Project Title	Enhanced Touristic eXperiences with 5G
Beneficiary(s)/Country	Nomad River, Portugal
Project Description	N-TourXP5G aims to revolutionise touristic experiences on-the-go by leveraging 5G technology. The project will conduct extensive testing and pilots using the IMAGINE-B5G platform in Portugal, focusing on the Aveiro region. The main goals are to improve touristic experiences through high-bandwidth dynamic and hyper-targeted content, focusing on two main use cases: 1) Augmented Tourism Experiences and 2) Automated and Anonymised Tourist Personalisation.
	The project seeks to enhance connectivity for travellers, provide immersive experiences, and offer real-time, personalised recommendation. It will utilise 5G infrastructure, edge computing, and AI to create seamless, engaging experiences for tourists while also benefiting local businesses and authorities through improved tourism management in the slo.travel platform.
Vertical	Tourism
Testbed	Portugal
Implementation timeframe	Oct-24 to Sep-25
Results & Impact	The slo.travel system has been re-architected for decentralized N-TOURXP-5G environments, with new components supporting edge-cloud coordination. It is deployed across a Portuguese edge VM and Nomad River's cloud infrastructure for testing (June–September). The system enables authenticated edge node connections, health checks, and AI agent handovers between edge and central nodes. Edge agents dynamically sync data via a queueing mechanism and leverage either local LLModels or cloud-based models, depending on hardware capabilities (e.g., Jetson devices). They support geo-aware queries with full anonymization, local databases, and low-latency user servicing.
	Content delivery now supports XR/AR/VR media from the edge, with sync/backfill to central servers and adaptive routing based on content type or network health. Sandbox support enables future edge-side content generation. The IMAGINE-B5G client has been updated to handle node discovery, media streaming, and XR widget integration. Orchestration and monitoring for decentralized deployments are in place, alongside a regional Aveiro test dataset with 100 services and 5 media types. The system is deployed in the facility infrastructure with testing due to take place between June and September.

OpenInfra

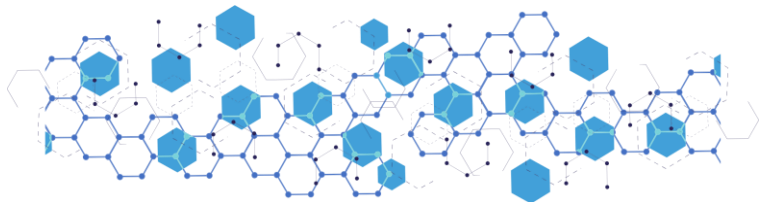| OC Project Title	An Open Infrastructure Portal for facilitating operations with LLM enhancements.
Benefiaciary(s)/Country	UNIVERSITY OF PATRAS, GREECE (EL)
Project Description	OpenInfra is an IMAGINE-B5G platform extension which aims to integrate and enhance infrastructure operations associated with the Spanish Facility. It enhances its operational capabilities through a dedicated open-source standards-based portal, including large language model (LLM) framework functionalities.
	OpenInfra is designed for Communication Service Providers (CSPs) and end users who can authenticate and gain access to the necessary resources of the Spanish Facility which exposes its infrastructure capabilities via NOKIA's Network as Code (NaC) (https://www.nokia.com/networks/network-as-code/) and CAPIF as defined by 3GPP.
	The OpenInfra project leverages the open-source framework of OpenSlice, based on ETSI's OSL SDG work, adding new functionalities. OpenSlice supports standardized TMF APIs, whereas NaC utilizes proprietary APIs. To bridge this gap, OpenInfra will implement the necessary API translations using available libraries, enabling seamless interactions between different systems. The graphical user interface (GUI) extensions developed within OpenInfra will be integrated into OpenSlice, facilitating service order processes and catalogue exposure of NaC service specifications, exposed via CAPIF.
Vertical	N/A
Testbed	Spanish Facility
Implementation timeframe	12 months duration, including long-term support towards the end of IMAGINE-B5G.
Results & Impact	The proposed solution encompasses the following functionalities:
	• An invoker extension for monitoring CAPIF APIs
	• A NaC API translation extension for User management, SIM subscription handling, QoS allocations, application and reading of KPIs
	• Integration with user access management
	• Exposure of Spanish facility services through Standardized TMF APIs
	• Seamless GUI experience based on OpenSlice
	• LLM prototype integration

OPTIMITER

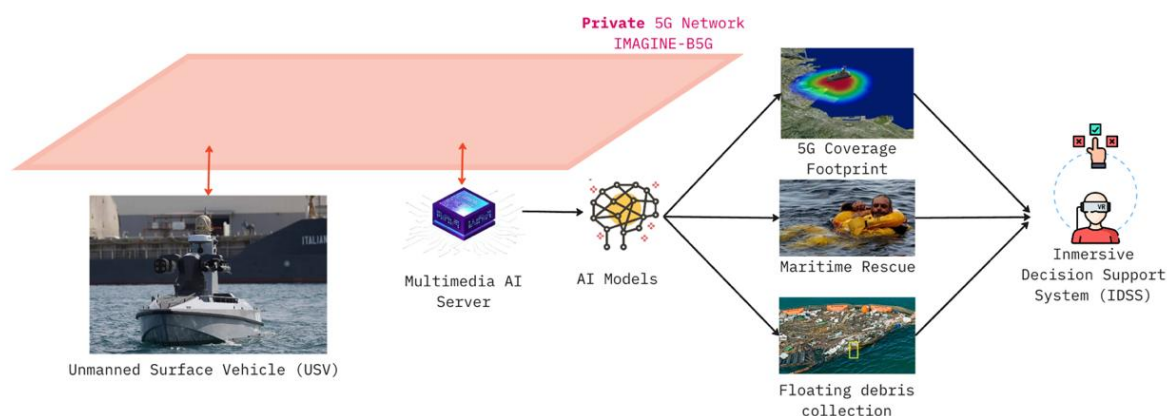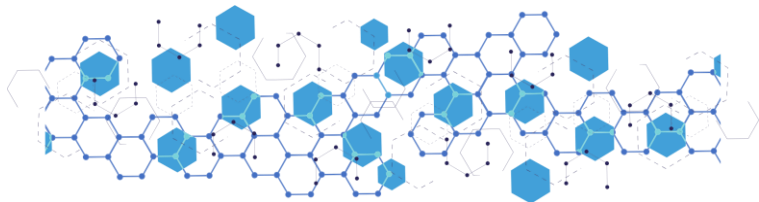|	
OC Project Title	Open and Programmable Telemetry for Disaggregated Monitoring of Energy and Resource Consumption in B5G Experiments and Research
Benefiaciary(s)/Country	Nextworks, Italy, Pisa
Project Description	The project implements a monitoring platform for collection and exposure of metrics on resource and energy consumption in 5G/B5G/6G experimental facilities. The platform integrates and extends open-source tools (Telegraf, Kafka, InfluxDB, Scaphandre, Prometheus, Grafana) to provide open interfaces to i) retrieve stored or streaming data, ii) configure monitoring jobs in a programmable manner, and iii) allow the integration with external data consumers and orchestrators for on-demand collection of metrics with variable setups.
Vertical	N/A
Testbed	Portugal facility
Implementation timeframe	October 2024 - September 2025 (12 Months)
Results & Impact	During its initial phase, the project defined the necessary extensions to collect heterogeneous data under a unified protocol. Subsequently, an implementation has been tested in Nextworks' Lab, successfully integrating multiple data sources into the extended platform. In particular, physical and virtual computational metrics such as CPU utilization, memory usage, disk I/O and network throughput are retrieved from Scaphandre, Kubernetes, OpenStack, and ProxMox agents. Energy consumption measurements are collected from smart PDUs (EATON G4) and software probes such as Kepler, Scaphandre. All metrics are unified and streamed in Kafka for real-time access and stored into InfluxDB for historical access. The platform API have been extended for configuring and triggering monitoring jobs dynamically, demonstrating high programmability and flexibility. Integration and initial tests on Portugal Facility (Aveiro) are expected for the second half of M8 (May 2025).

CRITICAL

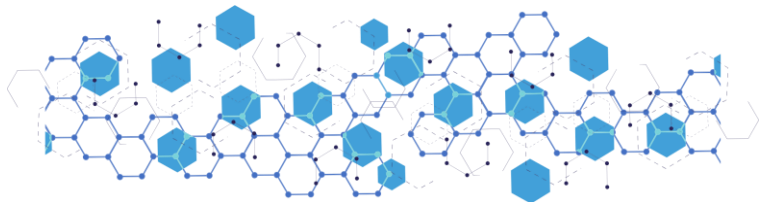| OC Project Title	Connected Paramedics and IoT Sensors for Real-Time Emergency Care
Benefiaciary(s)/Country	RedZinc Services Ltd. – Ireland
Project Description	Project CRITICAL demonstrates a novel 5G-enabled emergency response solution using the BlueEye platform, combining wearable biometric sensors, real-time video, and Mobile Edge Computing (MEC). The system supports paramedics in the field by transmitting live patient data and video to remote hospital specialists, ensuring faster, more informed interventions. It enables both critical hospital transfer and remote triage with hospital-at-home pathways, aligned with European Health Data Space (EHDS) principles for data sovereignty and privacy.
Vertical	Public Protection and Disaster Relief (PPDR) / eHealth
Testbed	Altice Labs / Aveiro, Portugal
Implementation timeframe	October 2024 – May 2025
Results & Impact	Completed system architecture design and deployment of the BlueEye Virtual Network Function (VNF) at the Aveiro 5G testbed. Successfully performed end-to-end (E2E) testing with real-time transmission of vital signs (ECG, respiration, pulse, temperature, Blood pressure) and live video from simulated field to hospital. Penetration testing and data governance validation completed, including simulation of Private APN, VPN over GRE, and MEC emulation. Demonstrated compliance with GDPR and data sovereignty requirements using European cloud infrastructure. Final preparations underway for full-scale polytrauma demo and ambulance-initiated hospital-at-home scenario.

RESCUE-5G

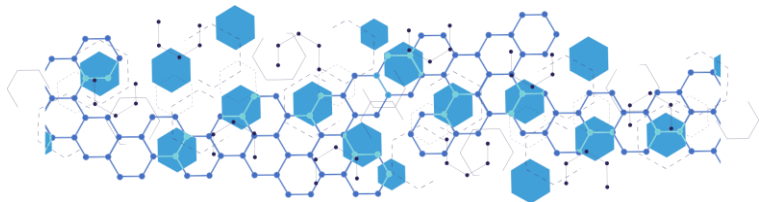| OC Project Title	Leveraging 5G and USVs for Enhanced Maritime Port Surveillance and Safety
Benefiaciary(s)/Country	FAVIT (Spain), LEMVOS (Germany)
Project Description	RESCUE-5G demonstrates an integrated solution combining 5G connectivity, Unmanned Surface Vehicles (USVs), Artificial Intelligence (AI), and Immersive Decision Support Systems (IDSS) to enhance safety, security, and operational efficiency in maritime ports. Conducted at the Port of Valencia using the IMAGINE-B5G platform, the project validates critical use cases such as person-overboard rescue and environmental monitoring (e.g., floating debris detection). Real-time FHD video and sonar data is transmitted over a private 5G network, processed using advanced AI models, and visualized via AR/VR tools to support timely and effective decision-making.
Vertical	Maritime Port Operations / Critical Infrastructure Protection
Testbed	Port of Valencia & UPV Campus (Spain)
Implementation timeframe	1/10/2024-30/09/2025
Results & Impact	RESCUE-5G delivered measurable improvements in safety, responsiveness, and automation for port surveillance and emergency response. Key achievements include real-time video/sonar streaming via 5G, AI-based anomaly detection with ≥90% accuracy, end-to-end latency under 200ms, and ≥30% reduction in operational load through immersive visualization tools. The final demonstration showcased network slicing, URLLC capabilities, and autonomous rescue/monitoring operations using USVs. The project validated a scalable and replicable model for other ports and critical infrastructures.

SIMONE

OC Project Title	Evaluating immerSIve coMmunicatiOn for eNhanced remote Education
Benefiaciary(s)/Country	Sweden
Project Description	The SIMONE project explores immersive remote education over Beyond 5G (B5G) networks, aiming to enhance instructor–trainee interaction through AR/VR technologies. It focuses on evaluating real-time, interactive learning experiences, with applications in engineering, art education (e.g., music), and healthcare training. The project is a collaboration between Karlstad University (KAU) and Softcode.
Vertical	Education
Testbed	Norwegian facility
Implementation timeframe	12 months, from November 2024 to October 2025
Results & Impact	We completed a fully functional SIMONE setup, integrating a Ricoh Theta 360° camera and Meta Quest Pro 2 as the HMD client using the WebRTC framework. Softcode developed the SphereVision app, enabling 360° live viewing from the HMD, while KAU provided the capture server, streaming server, and signaling server. The full system was successfully demonstrated at the University of Oslo (UiO) on April 28–29. Following the demo, we tested the SINLAB use case involving robotic hand tracking via a glove worn by a subject. After confirming accurate robotic hand responses to finger movements, we positioned the hand within the 360° camera view. The subject then used SphereVision on the HMD to observe the robot's actions in real time. The immersive view introduced no noticeable delay compared to earlier tests. One limitation remains: we couldn't assess performance over a B5G network due to connectivity issues at UiO. Figure: Highlights from the SIMONE demonstration at UiO: live 360° streaming, immersive HMD experience, and robotic interaction.

5G-VirtuFix

OC Project Title	Immersive Maintenance from Miles Away
SNS JU Project/Logo	IMAGINE-B5G
Benefiaciary(s)/Country	INTELLIA ICT/Greece, Neuron AI/Greece
Contact point	Vassilis Papataxiarhis, vpap@intellia.gr
Project Description	The 5G-VirtuFix project delves into the integration of Beyond 5G (B5G) technologies with immersive telepresence systems to contribute to the domain of machinery maintenance in logistics environments. Leveraging the low-latency communication capabilities of 5G networks, this initiative aims to facilitate real-time remote assistance for on-site engineers during intricate repair tasks. The core premise of the project is predicated on the hypothesis that many machinery maintenance tasks, which traditionally necessitate the physical presence of specialized experts, can be effectively executed by minimally trained on-site personnel, provided they receive real-time guidance from remote experts. This guidance is facilitated through an advanced telepresence system which employs AR interfaces. Such a system obviates the need for experts to travel, thereby reducing carbon footprint and operational costs, and ensures that the machinery downtimes are minimized.
Vertical	Transport
Testbed	Spain
Implementation timeframe	1-Oct-2024 – 30-Sep-2025
Results & Impact	By integrating advanced AR devices (Vuzix M4000 and Shield), AI-driven personal assistants, and a cloud-native backend architecture, 5G-VirtuFix will significantly reduce the need for expert travel, cutting operational costs and carbon emissions. Its main results include: • Immersive Remote Maintenance: real-time, hands-free machinery repair using AR devices at the Port of Valencia, with remote expert support from UPV. • Reduced Carbon Footprint: minimizes the need for expert travel through remote assistance. • AI-Driven Personal Assistant: integrates an intelligent assistant powered by Large Language Models (LLMs) to provide context-aware guidance based on technical manuals and operational procedures. • Improved Safety and User Experience: enhances worker safety and operational efficiency by enabling intuitive, real-time expert guidance in complex environments.

Volograms

OC Project Title	Volograms for Academia
SNS JU Project/Logo	IMAGINE-B5G
Benefiaciary(s)/Country	Volograms, Ireland
Contact point	Rafael Pagés, rafa@volograms.com
Project Description	Volograms for Academia is a project exploring the innovative application of volumetric video and WebAR to bring immersive educational content closer to a wider audience. Utilising Volograms' AI-powered volumetric video technology and leveraging the high-speed capabilities of 5G networks, we aim to enable educators to create, share, and access immersive educational experiences with unprecedented ease and accessibility. By integrating this technology with WebAR, students and educators can interact with volumetric holograms using everyday devices like smartphones and tablets. This approach democratises access to advanced educational tools, making high-quality, interactive learning experiences available to a broader audience.
Vertical	Education
Testbed	Spanish facility
Implementation timeframe	12 months, from November 2024 to October 2025
Results & Impact	The project will develop a streamlined platform where educators can easily produce their volumetric videos by uploading a video with their lecture. These volumetric videos will be hosted online, creating a rich repository of educational content that can be accessed on demand. Whether it's a detailed anatomical study, a historical re- enactment, or a complex scientific demonstration, educators can bring subjects to life in a way that is both engaging and pedagogically effective. Project VM4Academia will advance the objectives of the IMAGINE-B5G project on multiple levels: • Enhancing the accessibility and effectiveness of the XR remote educational tool, transforming it into a more impactful human-to-human experience. • Facilitating seamless interaction among users from diverse contexts, utilising the devices they already have, and avoiding the need of downloading apps. • Demonstrating the substantial impact of Vologram Messages, an accessible XR solution, in educational environments and vertically integrated with the IMAGINE-B5G facilities.