



Boosting Short-Range Wireless Communications in Entities: the 6G-SHINE Vision

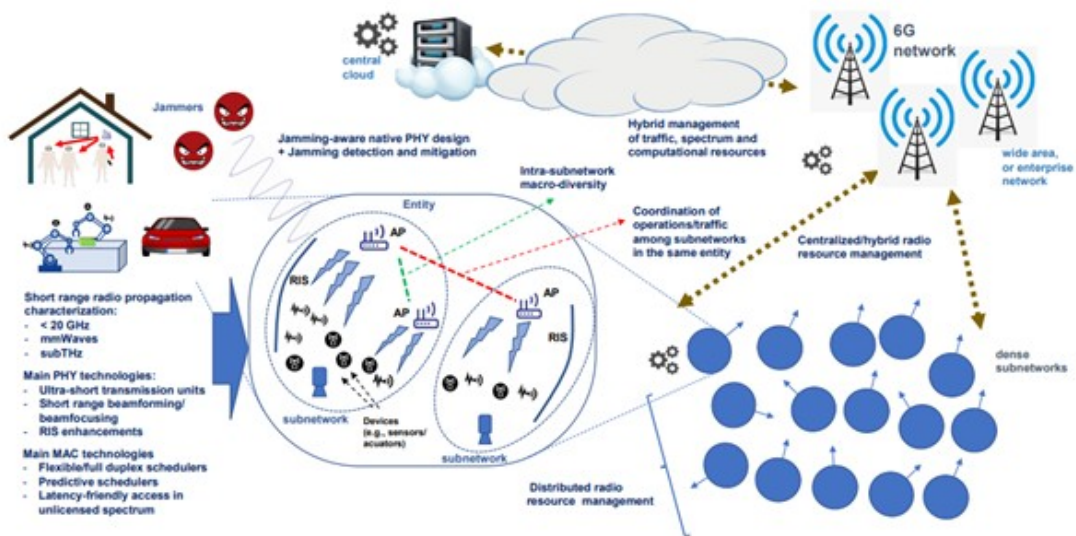
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Read our 6G-SHINE Vision Paper

In-X subnetworks are short-range low power radio cells, located at the edge of the 6G 'network of networks', to provide highly localized and high-performance wireless connectivity in entities like robots, production modules, vehicles, classrooms, gaming arenas.

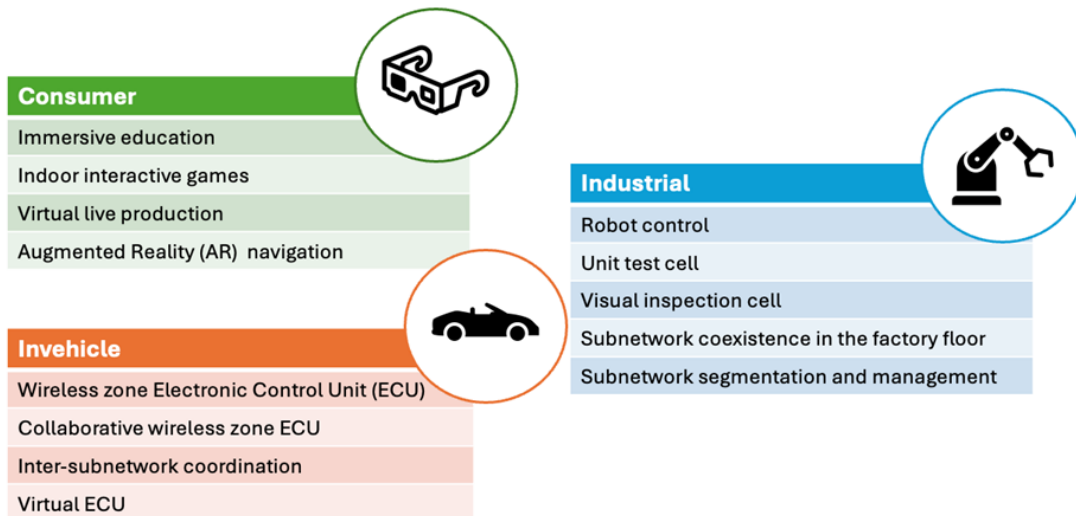
Discover the vision of the 6G-SHINE project in this paper authored by all project partners!

[Read the vision paper here](#)



6G-SHINE defined in-X subnetworks use cases

A significant effort has been spent in the project in defining the relevant use cases for 6G in-X subnetworks, encompassing consumer, industrial and in-vehicle use cases. The following use cases have been defined:



For each use case, a detailed description of application and deployment scenarios, architectures, requirements, key performance indicators (KPIs) and key values indicators (KVIs) has been extensively presented in deliverable D2.2, submitted on February 28, 2024. In the same deliverable, we have introduced the essential definitions and nomenclature for all subnetwork elements that are relevant in the different use cases. They include network elements, their roles and different communication modes, along with a reference architecture. Such descriptions are being used by partners active in WP3 and WP4 for tailored physical layer, medium access control, radio and computational resource management solution design.

[Read deliverable D2.2 here](#)

Dissemination activities



6G-SHINE at 2023 IEEE Future Networks World Forum

On November 15, coordinator Gilberto Berardinelli presented the vision of the 6G-SHINE project at the 2023 IEEE Future Networks World Forum, Symposium on Vision and Facts on 6G and Future Networks in Europe, held in Baltimore, USA.

Gilberto also participated in a panel discussion moderated by Antonio Skarmeta (Universidad de Murcia, Spain) on the Challenges for 6G in Europe, together with Konstantinos Trichas (6G-IA), Johann Marquez-Barja (imec), Andreas Kunz (Lenovo), and Michail Kourtis (NCSR Demokritos).



Keysight introducing 6G-SHINE at MWC'24

The Mobile World Conference (MWC'24), a mega connectivity event for the technology industry, was held this year in Barcelona, Spain, where Keysight Technologies actively participated and presented several technology demos at different booths. At booth #5E12, a VRACK was organized to highlight Keysight research activities across various 6G SNS JU projects including 6G SHINE. The 6G SHINE project framework was introduced along with different technology components (TCs) and work packages (WPs), and Keysight's role was highlighted concerning TC2/WP2 and WP5.



Webinar on RIS

On February 22, Vittorio Degli Esposti and Enrico Maria Vitucci (CNIT) hosted a webinar on “Macroscopic ray based modeling of scattering from Reconfigurable Intelligent Surfaces (RIS)”, in collaboration with the TIMES project. In the webinar the speakers presented an innovative, fully ray-based approach to RIS scattering that is both efficient and electromagnetically consistent. The presented model is suitable for forward ray tracing simulations in systems that incorporate RIS to improve performance and functionality. The webinar had around 55 attendees and was followed by an interesting discussion with some of the attendees on the applicability of the presented model to wireless communication system design.



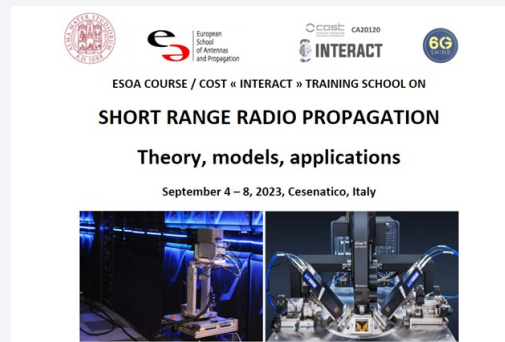
Joint SNS TIMES, 6G-SHINE, TERRAMETA workshop at WiLab laboratories, Bologna

Together with SNS projects TIMES and TERRAMETA, we have organized a workshop on 6G research, with particular focus on



Keynote talk at VTC2023-Fall

On the 11th of October 2023, the 6G-SHINE project coordinator Gilberto Berardinelli, Aalborg University, gave a keynote presentation titled “6G Subnetworks for Vertical Industries: Opportunities and Challenges” at the 2nd IEEE Workshop on "B5G/6G support for space/air/ground/marine/submarine cooperative, connected, and autonomous vehicles", co-located with IEEE VTC2023-Fall.



PhD course on short range radio propagation

On September 11-14, a PhD course on “Short-range radio propagation: Theory, Model and applications” was organized by Vittorio Degli Esposti and Enrico Maria Vitucci (CNIT) in Cenesatico, Italy, in collaboration with COST action INTERACT. The course was followed by 26 PhD students from several European universities, and delved into fundamentals of propagation and scattering, ray-tracing models, MIMO channels,

smart radio environments and signal processing enhancements. The workshop took place at WiLab laboratory, Bologna, Italy, on February 1st. The workshop also included speakers from the Italian project RESTART-IN. The project PLs Gilberto Berardinelli (6G-SHINE), Luca Sanguinetti (TIMES), Luis Pessoa (TERRAMETA), and Giampaolo Cuozzo (RESTART-IN) introduced the vision of their projects. The program included high quality presentations from each of the projects, with focus on physical layer components such as reconfigurable intelligent surfaces, THz communication enablers, self-conjugating metasurfaces. Presentations have sparked interesting discussions among the participants and pave the way for future collaboration and common dissemination activities. Well done!

regulation and standardization aspects for short-range communication. The course also included a practical session on mmWave and THz channel sounding, led by Usman Virk (Keysight).



2nd 6G-SHINE consortium meeting in Munich

On September 11th and 12th, 2023, the 6G-SHINE project held its second consortium meeting in Munich, Germany, kindly hosted by Apple.

The two-day gathering featured presentations on progress in the project's first six months, including plans for upcoming activities, deliverables, and milestones. Key highlights included identifying use cases for consumer, industrial, and automotive subnetworks and initial proposals for physical layer enablers, medium access control, radio resource management, and architecture solutions for in-X subnetworks. We are excited to continue our journey towards realising 6G in-X subnetworks!



IEEE Conference on Standards for Communications and Networking
6-8 November 2023 // Munich, Germany

SPECIAL SESSION

Key challenges for enabling high-performance short-range communications in extreme propagation environments

(organized by Research Projects SNS TIMES, TERRAMETA, and 6G-SHINE)

Wednesday, November 8 2023, 10:00-13:30

Special session at IEEE CSCN 2023 organized by SNS TIMES, TERRAMETA and 6G-SHINE

We have organized a special session on “Key challenges for enabling high-performance short-range communications in extreme propagation environments” at the coming IEEE Conference on Standards and Communication Networking. This special session will address the research challenges that are common to the three projects, including the provision of high demanding communication services in industrial, automotive and consumer scenarios. The special session featured two keynote presentations by Sean Ahearne (Dell EMC, Portugal), and Andreas Mueller (Bosch GmbH, Germany), followed by a panel discussion featuring other representatives from industry and academia.

[Read more](#)

6G-SHINE project

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6GSNS

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