one6G ASSOCIATION

AN OPEN ACCELERATOR FOR 6G RESEARCH IN EUROPE

Assoc. Prof. Nancy Alonistioti
FOUNDING PHASE

OVERVIEW

• Launched in March 2021.

• one6G is a non-profit and membership fee free association.

• Offering an open collaborative framework to explore how to move beyond current communication networks technologies and business.

FOUNDING MEMBERS

one6G envisions a future where 6G technologies and solutions allow to unleash the potential of smart connectivity for a secure, resilient and sustainable development of our society and economy.

VISION
one6G aims to act as the 6G Research an Innovation hub, gathering major stakeholders from various research, innovation and technological areas and vertical domains.

Early on-boarding of vertical industries targets:

- Smart networks for green transition
- Energy sector
- Automotive, Transportation, Maritime sector
- Industrial-smart factory sector
- Health sector
- Cities and public services sector
- Media and entertainment sector
- Tourism, culture and heritage sector

one6G facilitates collaborations for the development of 6G solutions targeting economy and societal needs such as knowledge transfer, verification and validation for 6G solutions. one6G is open to focus on new topics brought in by members, as far as contribution driven.
MEMBERS
As of Nov. 2022 (87 members from 26 countries)

Latest info please refer to: https://one6g.org/members/
**ORGANIZATION STRUCTURE**

**one6G Board** *(Chair, Secretary)*

**WG1**  
Use Cases, KPIs, Future Market and Business Scenarios  
Collecting and analyzing 6G related use cases, scenarios, and requirements

**WG2**  
Enabling Technologies and System Architecture  
Shaping the overall technology foundation  
(Higher frequencies, intelligent user plane / in-network computing, distributed / federated AI, next generation MIMO, integrated sensing and communication, NTN, etc.)

**WG3**  
Communication and Dissemination  
Community building and association promotion  
(6G position paper, web portal, events, newsletter/news, liaisons, webinars, etc.)

**WG4**  
Evaluation, Testbeds, and Pilots  
From development to deployment  
(Guidelines, gap analysis, testing procedures and certification, testbeds and trials, integrated sensing and communication)

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General Assembly
ONE6G LEADERSHIP TEAM

one6G Board

General Assembly and Board Chair
Assoc. Prof. Nancy Alonistioti

WG1
Use Cases, KPIs, Future Market and Business Scenarios

WG1 Chair: Prof. Mohammad R Shikh-Bahaei, KCL
WG1 Vice Chair: Prof. Periklis Chatzimisios, IHU

WG2
Enabling Technologies and System Architecture

WG2 Chair: Dr. Zoran Despotovic, Huawei Technologies
WG2 Vice Chair: Prof. Luca De Nardis, CNIT

WG3
Communication and Dissemination

WG3 Chair: Dr. Xueli An, Huawei Technologies
WG3 Vice Chair: Prof. Albena Mihovska, CTIF Global Capsule (CGC)

WG4
Evaluation, Testbeds, and Pilots

WG4 Chair: Josef Eichinger, Huawei Technologies
WG4 Vice Chair: Youssef Nasser, Greenerwave

Note: one6G governance has been elected following the e-voting procedure, defined by the association RoP (Rules of Procedure), which started in August and completed on 4.11.
## CURRENT WORKING PROGRAM

<table>
<thead>
<tr>
<th>Work Items</th>
<th>Scope of the WGs</th>
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| **WG1 Use cases, KPIs, and Future Market and Business Scenarios** | • Consolidate vision  
• Use case and requirements analysis  
• Streamline terminology, etc. |
| WI 101 - Collection of 6G-related Use Cases and Related Scenarios (completed and in the maintenance mode) | |
| **WG2 Enabling Technologies and System Architecture** | • Research of key enabling technologies, concepts, etc.  
• Evaluation and selection of most promising ones  
• Integration thereof into a coherent architecture |
| WI 204 - Higher Frequencies  
WI 205 - 6G Radio Access  
WI 207 - Intelligent User Plane, In-Network Computing  
WI 208 - Distributed/Federated AI  
WI 209 - Next-generation MIMO  
WI 210 - Integrated Sensing and Communication  
WI 211 - Flexible Programmable Infrastructures  
WI 212 - Non-terrestrial Networks | |
| **WG3 Communication & Dissemination** | • Liaisons and partnership management  
• Marketing and promotional activities  
• Preparation of workshops, conferences, etc. |
| WI 301 - 6G position paper (completed)  
WI 302 - Dissemination: web page, social media, newsletter, one6G internal and external events, webinars | |
| **WG4 Evaluation, Testbeds, and Pilots** | • Aspects of testing and evaluation  
• Test procedures and verification  
• Testbeds, prove of concepts and trials, etc. |
| WI 210 - (cross WG2/WG4) Integrated Sensing and Communication  
WI 402 - Definition of the evaluation guidelines for simulation/emulation | |
KEY MILESTONES

2021

Feb 5
one6G
启动

March 29
Founding of one6G

June 9
EuCNC one6G Special Session

Sept 16
China IMT-2030 6G Summit (Keynote)

Oct 7
Second info. Day

Oct 17
ITU-R IMT2030 First contribution

Nov 10
53 members
1st one6G Summit
one6G position paper

2022

Jan. 12
ITU-R IMT-2030 2nd contribution

Feb. 08
one6G in WiLab workshop

Mar. 02
one6G 1st GA

Mar. 28
one6G in WiLab workshop

Apr. 13
EuCAP one6G session

May 5
Open Lecture - 1: 6G Network AI

Jun. 8
EuCNC one6G special session on AI for 6G and vertical

Jun. 9
Open Lecture - 2: one6G 6G WP

Jun. 13
Open Lecture - 3: one6G 6G WP V2

June 15
ITU-R IMT-2030 3rd contribution (ITU-R IMT-2030 workshop)

July 7
Open Lecture - 3: ISAC

Sept 6
Open Lecture - 3: 6G Testing/Simulation

Sept 15
WPMC2022 Invited speaker

Sept 21
RSPG workshop

Nov 1
2nd one6G Summit

Nov 10
87 members !
from 26 countries
one6G published the 1st position paper to lay out its vision and work plan in Nov 2021.

Vertical Use Cases and Requirements

- Higher and THz frequencies
- Radio Access
- Next generation MIMO
- Integrated sensing and communication
- Distributed and federated AI
- Flexible programmable infrastructures
- Non-terrestrial networks
one6G published 2 white papers during EuCNC2022 and ITU-R June meeting time period.

6 Use cases families with 25 use cases analyzed:
- Manufacture: 7
- Automotive: 5
- Health: 5
- Telecom (MBB/Resiliency): 4
- Agriculture: 3
- Transportation (railway): 1

7 technologies identified:
- THz Frequencies
- 6G Radio Access (6GRA)
- Next Generation MIMO
- Integrated Sensing and Communication (ISAC)
- Distributed Federated AI
- Intelligent User Plane, In-Network Computing
- Flexible Programmable Infrastructures
VERTICAL SURVEY

one6G deeply engages with vertical partners to understand 6G use case and requirements.

"6G will support advances in communications technologies" – that is what the responders who work in the telecommunications domain are hoping for. Their top 3 expectations for 6G are:
1. IoT data exchange and processing
2. Digital twin
3. Unmanned vehicles/autonomous driving

"Reliability and positioning accuracy are essential for industrial stakeholders," said the responders from the manufacturing sector. What they need 6G to provide is:
1. AR/VR services
2. Digital twin
3. Robotic infrastructure

Representatives of the automotive sector are hoping for "100% safe and cheaper real-time data exchange with better coverage." Their top expectations for 6G are:
1. Advanced safety services
2. Faster access to cloud and virtual services
3. IoT data exchange and processing

The responders from the education domain highlighted that "enriched online courses are becoming a trend." What they expect 6G to provide is:
1. Faster access to cloud and virtual services
2. AR/VR services
3. Extended reach of connectivity service
one6G deeply engages with academic ecosystem and organizes many industry special sessions.
one6G establishes open lectures series in 2022, as an open 6G knowledge sharing platform.
one6G actively engages with external organizations to shape 6G vision together.

- 3 contributions to ITU-R IMT 2030 Vision
- Liaison partner of ETSI
- Consultation partner of RSPG
- MOU partner of WWRF

WWRF-one6G MoU Signing Ceremony on Nov 9th, 2022
NEW ACTIVITIES ANNOUNCEMENT (1/4)

WG1: New initiative on 6G enabled Robotic use cases

• Definition and Classification of robotic usage scenarios
• A deep insight of the actual robotics requirements for 6G and corresponding enabling technologies
• Impact areas of 6G on robotics applications
• Increasing market and business interests in connected robotics via 6G
NEW ACTIVITIES ANNOUNCEMENT (2/4)

WG2: New work item on non-terrestrial networks (NTN)

Motivation for NTN in 6G:

- Provide ubiquitous connectivity to areas with limited or no coverage
- Complement TN to improve reliability and resilience of communications
- Guarantee service continuity for mobile mission-critical applications (e.g. V2X, IoT)

Opportunities and challenges:

- vLEO satellites at high density and with gNB capabilities enable reduced latency thanks to close distance to earth, but high moving speed induces Doppler and tracking problems.
- Connection network between satellites via inter-satellite links (ISL) to enable reliable and frequent satellite handover.
- Integration of NTN and TN to allow multi-connectivity and seamless service continuity is a system design challenge.
NEW ACTIVITIES ANNOUNCEMENT (3/4)

WG3: New open lecture on “Flexible Programmable Infrastructures”

Rui L. Aguiar
Full Professor at University of Aveiro

Henning Schulzrinne
Levi Professor of Computer Science at Columbia University

Diego R. Lopez
Senior Technology Expert at Telefonica I+D

REGISTRATION NOW OPEN
NEW ACTIVITIES ANNOUNCEMENT

WG4: new initiative on "Open and shared measurement data"

- Starting with recorded subTHz sensing data.

- Recorded sensing data will be available for one6G members on one6G Sharepoint.

- WG4 welcomes all one6G members to use it for further experiments (e.g. data analytics, imaging, etc.)
Contributors

- **THz Frequencies:** Thomas Kürner, Tobias Doeker (TU Braunschweig), Mate Boban, Tommaso Zugno (Huawei), Claudio Paoloni (Lancaster University).

- **6G Radio Access:** Israel Leyva Mayorga (Aalborg University), Nikolaos Pappas (Linköping University), Najeeb Hassan (Huawei), Peter Trifonov (NTMO).

- **Next generation MIMO:** Danasly P. Prado Alvarez (Universitat Politècnica de València), Eduard A. Jorzwieck (TU Braunschweig), Ferhad Askerbeyli, Mario Castañeda, Martin Schubert, Michail Palaiologos, Ronald Böhnke, Samed Bazzi, Tobias Laas (Huawei).

- **Integrated Sensing and Communication:** Andrea Giorgetti (University of Bologna), Richard Stirling-Gallacher (Huawei).

- **Distributed Federated AI:** Ramin Khalili (Huawei), Sokratis Barmpounakis, Lena Magoula, Nikolas Kourisliropas (NKUA), Claudia Campolo, Antonio Iera, Antonella Molinaro (CNIT), Elizabeth Palacios (Universitat Politècnica de València), George Karetsos (University of Thessaly).

- **Intelligent User Plane:** Susanna Schwarzmann (Huawei), Jari Mutikainen, Riccardo Guerzoni (Docomo Euro-Labs).

- **Flexible programmable Infrastructures:** Carlos Guilmarães, Luca Cominardi (ZettaScale Technology SARL), Altar Zabala Orive (Telcoaria), Artur Hecker, Dirk Trossen, Zoran Despotovic (Huawei).

https://one6g.org/resources/publications/
CONTACT US TO LEARN MORE

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THANK YOU FOR YOUR ATTENTION

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