

European Technology Platform Networkworld Europe

Workshop on ISAC/JSAC

POST-EVENT DETAILED REPORT

Jointly Organized by

September 18th , 2026



Event Overview

Objective: The workshop aimed to exchange perspectives on the maturity, emerging use cases, technical challenges and standardization priorities of JCAS/ISAC, and explore how sensing capabilities can be introduced into future communication networks.

- **Location:** Hybrid, Virtual and onsite in Shanghai
- **Date:** 18/2026
- **Duration:** 3 hours
- **Number of registrations:** 130
- **Event post-report drafted by:**
Fatma Marzouk, with contributions from Networld Europe and CCSA organization teams.

Agenda

Workshop	Introduction of JCAS/ISAC in Networks - NetworldEurope & CCSA	
Date	September 18 th 9:00 – 12:30 CET, 15:00 – 18:30 Beijing	
Agenda	Talks	Speakers
09:00-09:20	Opening speech and introduction	Rui Luis Aguiar Networld Europe, Steering board chair Wen, Ku CCSA Board Chair
Panel 1		
09:20-09:50	Current Situation, Challenges & Evolution	Razvan Mihai, IoT Architecture & Services Expert, Orange Romania TONG, Wen, CTO, Wireless Network, Huawei Technologies
09:50-10:20	New Use Cases & Technology Trends	Ljupco Jorguseski - Senior Consultant at TNO ICT GAO Yin, Standard Director, ZTE
10:20-11:00	Current Situation & Challenges / New Use Cases & Tech Trend Q&A – (Speakers + Panel Guests Xin GUI senior researcher, China Mobile Communications + Mika Rantakokko, Connectivity Systems Lead, VTT Finland)	
11:00-11:20	Break	
Panel 2		
11:20-11:50	Standards & Next Step Industry Development	Du, Ying, Deputy Director, CAICT Sebastian Robitzsch, Senior R&I Manager, InterDigital Europe Ltd.
11:50-12:20	Standard & Next Step Industry Development Q&A - (Speakers + Panel Guests Wang, Xuemin VP of Huawei European Research Institute, Mingyang ZHAO, Wireless Technology Expert at China Unicom Research Institute.)	
12:20-12:30	Closing words	Rui Luis Aguiar Networld Europe, Steering board chair Wen, Ku CCSA Board Chair

Program Summary

Opening Speech and introduction

Rui L. Aguiar (Networld Europe, Steering Board Chair/ University of Aveiro)

Prof. Aguiar welcomed the speakers and the audience and described the motivation of the workshop. He introduced the two-session format and emphasized the value of comparing the perspectives of operators, industry and researchers. Prof. Aguiar concluded his opening speech by describing the workshop program, the speakers' lineup and the interaction guidelines.

Wen, Ku (Board Chair, CCSA)

Mr. Wen, Ku welcomed the participants on behalf of CCSA. He described JCAS/ISAC as a prominent 6G research direction that breaks the traditional separate model of communication and sensing by combining data transmission, environmental sensing, and spectrum resource. He described the solid progress in China through collaboration among enterprises, universities and research institutes, from basic research and prototypes to field trials and more systematic integration. He also acknowledged obstacles to wider deployment, including technical bottlenecks, limited use cases, incomplete standards and insufficient industry coordination. Against this background, he presented this workshop as an opportunity for open exchange with European partners and for building a shared understanding of technical challenges and industry priorities.

Looking ahead, Mr. Wen, Ku identified four priorities. First, research should address interference between communication and sensing, unified signal design and intelligent network management. Second, trials should be guided by practical scenarios, including low-altitude applications, intelligent transport, smart IoT and space-air-ground networks, to help connect research with commercial use. Third, international standardization should clarify technical parameters, interfaces and test methods to support development at scale. Finally, he called for closer cooperation among enterprises, universities, research institutes and standards bodies, including continued exchanges between China and Europe.

Panel 1

Razvan Mihai (Orange Romania)

Mr. Mihai presented ISAC from a mobile operator's perspective. He first discussed 5G positioning as a relevant precursor, illustrating it with an Orange Romania trial at an automotive factory. A 5G standalone network tracked delivery carts sent their location data to the factory's digital twin, achieving accuracy below 50 centimeters with data sent at one-second intervals. He distinguished positioning connected devices from sensing unconnected targets.

He then described Orange's assessment of current drone-detection approaches, including active and passive radar that could be integrated with cellular infrastructure, Open RAN applications analyzing radio measurements, and solutions that examine signalling from connected devices. Turning to future ISAC, he identified challenges such as spectrum availability, the cost of massive MIMO antennas, precise synchronization between base stations and computing capacity. He also described Orange Romania's participation in the 6G-MUSICAL and ICCG projects, including a planned agricultural trial involving ground and airborne radio units, vehicle localization and energy transfer to passive sensors. Finally, he identified defense, vehicles, environmental

monitoring and public safety as potential areas of demand, while stressing that operators still need convincing use cases and paying customers.

Tong, Wen (Huawei Technologies)

Dr. Tong, Wen began his presentation by distinguishing between two approaches to ISAC. In what he called Type 1, communication remains the network's primary function, while sensing shares its signals, spectrum and radio infrastructure. He explained how long-term radio measurements could be used to build a site-specific wireless twin that models signal propagation and helps improve communication performance. Further processing could identify objects in the surrounding environment and produce a fuller digital twin to support AI services. To illustrate this possibility, he described the use case of sensing a person's arm movement, using deep learning to extract its trajectory and converting that movement into instructions for a robot to imitate it. He also noted the different processing and privacy considerations for long-term environmental models and short-term information about people.

The speaker then introduced Type 2 as a dedicated sensing approach, designed for applications whose detection requirements cannot readily be met by a network built primarily for communications. He linked this approach to the growth of low-altitude activity and the need to detect small, potentially hostile drones. Such drones may fly slowly or among buildings, where conventional cellular coverage can leave blind spots. For Type 2, he compared a large, horizon-facing antenna array at a macro cellular site with a second design that keeps the cellular base station for communications and adds a separate, wider-bandwidth mm-wave sensing array. He highlighted that he favors the second design, while noting that missed detections, false alarms, interference and jamming remain difficult challenges. Dr. Tong, Wen concluded that the performance assessed still fell short of stringent defense requirements for hostile-drone detection.

Ljupco Jorguseski (TNO ICT)

Dr. Jorguseski presented TNO's work within the Future Network Services (FNS) programme in the Netherlands, a public-private 6G consortium involving more than 70 partners. He noted that radar sensing is well established, but argued that the challenge for ISAC is to integrate sensing into communications infrastructure at a cost that supports viable services. FNS therefore examines the full chain: measurements at the base station, processing by a sensing function, exposure of the results through the network, and their eventual use by other organizations. This incremental approach aims to make sensing available as a network service.

He then explained how FNS is assessing that approach against the needs of potential users. Discussions with traffic authorities concern counting cars and bicycles, while work with drone stakeholders and the Port of Rotterdam explores monitoring, inspections and other port operations. TNO is also speaking with radar specialists, police and air traffic control to understand performance requirements and each organization's possible role. Alongside these use cases, interviews address who owns sensing data, who may access it and how it should be protected. These findings feed into FNS contributions to 3GPP and ETSI, while developments in those bodies guide the consortium's research.

Yin Gao (ZTE Corporation)

Ms. Gao, Yin began with a brief review of sensing development from 5G Advanced toward 6G. She explained that work in 5G Advanced gives the industry practical experience, while 6G is expected to support more sensing arrangements and more demanding performance requirements. She said that 5G Advanced work has focused on detecting and tracking UAVs, vehicles, people and automated guided vehicles. Building on this foundation, she presented a wider range of 6G scenarios, including low-altitude security, intelligent transport, waterway monitoring and long-term observation of bridges, tunnels and other infrastructure. She linked these scenarios

to the use cases captured in 3GPP TR 22.870. In low-altitude security, a particular challenge is detecting and tracking uncooperative aerial targets, including drones that are not connected to the mobile network. Moving from applications to radio capabilities, Ms. Gao contrasted the base-station monostatic sensing discussed for 5G Advanced with the additional base-station and user-equipment sensing modes envisaged for 6G, alongside higher accuracy requirements. To illustrate the technical progress towards these scenarios, Ms. Gao presented ZTE field tests using a monostatic prototype for UAV detection, reporting sub-meter sensing accuracy, a range exceeding one kilometre and 99% detection accuracy under the test conditions. She also showed a multiple-target test with a sensing range exceeding 1.4 kilometres, followed by waterway demonstrations that detected vessel movements and triggered alerts when a ship entered or left a monitored area.

Turning to the technologies that could support future ISAC services, Ms. Gao, Yin described a framework in which a sensing function in the core network requests measurements from the radio access network or user equipment, provides assistance information and receives the measurements in return. She noted that the final sensing result could be derived at the user device, the base station or the sensing function, depending on the design. At the radio level, Ms. Gao explained that pulsed signals can detect distant targets but may miss nearby ones whose echoes return before the receiver is ready. Continuous-wave signals can help cover this short-range blind zone. She therefore discussed combining the two to improve coverage across different distances. She also considered how sensing, communication and positioning could share reference signals and measurements, including measurements useful for communication feedback. Finally, she explained that upward-directed sensing signals could interfere with neighbouring users, requiring interference measurements and coordination between network nodes.

Open Challenges from Panel Discussion 1

The first panel moved from the presented trials and use cases to whether ISAC could become a dependable and commercially viable service. Dr. Mika Rantakokko (VTT) argued that sensing must create revenue, reduce costs or improve resilience. Mr. Xin, Gui (China Mobile) described a low-altitude security demonstration network in Zhuhai that had been delivered to a customer. Responding to the question of operational readiness, Ms. Gao, Yin (ZTE) cited an air-to-ground monitoring system at Baoshan Airport in Yunnan, a police UAV management platform in Zhejiang, and sensing-integrated base stations used for low-altitude UAV transport applications in Shanghai and Zhejiang. She presented these as practical applications of 5G Advanced sensing, while acknowledging limits in accuracy, competition for radio resources and synchronization. Dr. Jorguseski (TNO) added that the technology is nearly mature but stressed that sensing systems must be flexible enough to be configured for the specific needs of each deployment. Without that adaptability, and a careful balance with existing communication services, he warned that they could face difficulties in the market. Mr. Razvan Mihai (Orange Romania) expected the first deployments to be highly localized, in places where there is clear demand and a customer willing to pay.

The panel then considered why customers in those locations would choose ISAC over existing radar or camera systems. Mr. Xin, Gui described their company's approach in China: upgrading selected 5G Advanced base-station sites for drone sensing instead of building new sites. The changes included additional sensing-processing boards, greater upward antenna coverage and radio modifications to reduce self-interference. This raised the question of whether the equipment costs and radio resources used for sensing would be justified. Dr. Rantakokko pointed to ports, airports and logistics facilities where ISAC could complement existing surveillance and mainly fill coverage gaps. Dr. Jorguseski cautioned that its added value must justify the cost; otherwise, a separate sensing system might be preferable. Razvan Mihai described sensing as part of private-network offerings that combine communications with other sensors.

Regulation remained an open question, particularly whether spectrum licensed for communications could also be used to provide sensing services. Dr. Jorguseski called for early engagement with regulators; Razvan linked the issue to standards for sharing resources between sensing and communications; and Ms. Gao identified spectrum allocation as a condition for wider deployment. The panel also considered what 6G sensing would add beyond 5G positioning. Dr. Mihai pointed to accurate outdoor sensing and unconnected targets, while Ms. Gao argued that sensing could provide a broader representation of the physical environment than positioning alone.

The discussion closed with examples of services already delivered using current or pre-standardized technologies, alongside more tentative expectations for standardized ISAC services. Dr. Rantakokko added that ownership and control of sensing data must be clear if new services are to gain trust and commercial value. Asked which services could be sold first and to whom, Ms. Xin Gui said China Mobile's Zhuhai low-altitude security system had already been delivered, Dr. Mihai cited Orange Drone 360 as an existing commercial service based on pre-standardized technology, while Dr. Rantakokko suggested the situational-awareness service for ports, airports and other critical infrastructures. Dr. Jorguseski indicated that further standardized ISAC services might emerge around early 2028, although the timing remained uncertain.

Panel 2

Sebastian Robitzsch (InterDigital Europe Ltd)

Dr. Robitzsch reviewed the work of ETSI ISG ISAC and its relationship with 3GPP's 6G standardization. The group began its first work programme at the end of 2023. Release 1 comprises five work items, four of which had resulted in published Group Reports covering use cases, channel modelling and evaluation, architecture, and security and privacy. The report for the fifth work item, on integrating computing with ISAC, is still in preparation. He stressed that these are exploratory reports rather than specifications, allowing ETSI to examine requirements and possible solutions ahead of 3GPP's specification work. He then turned to Release 2, started in 2025, which looks beyond the initial 6G specifications through work on enhanced architecture, security and resilience, AI and sensing-data handling. It is also inviting results from trials to establish what performance and functionality are feasible. Dr. Robitzsch linked data handling to a potential business opportunity for operators: processing sensing data could allow them to offer services beyond connectivity, while also requiring attention to the sensitivity of that data. Before turning to architecture, he noted that Release 1 had examined 18 use cases focused on 6G, some of which were subsequently brought into 3GPP SA1 discussions and refined there.

To illustrate the architectural work, he presented a reference model from Release 1 to clarify the functions involved in providing a sensing service, rather than define a final 6G architecture. It distinguishes sources of sensing data, a producer that turns those inputs into a service, and consumers of that service, including possible third parties. He also described sensing tasks that could involve both 6G and other technologies. Building on this model, the ISG examined how the 6G core network could coordinate sensing tasks, with possible functions for sensing coordination and analytics, privacy and data confidentiality. It also considered whether these functions should be separate or combined, along with more forward-looking ideas for data storage, charging, sensing gateways and a distinct sensing plane for data handled within the network. Dr. Robitzsch closed by noting that Release 2 continues the architecture work and develops security, data-handling and AI questions further, drawing on results from trials to assess what sensing technologies can deliver [in a dedicated work item of the ISG ISAC].

Du, Ying (CAICT)

Ms. Du Ying's presentation began with a brief standardization timeline for 5G Advanced and 6G sensing. She described 5G Advanced work centred on base-station monostatic sensing, alongside large-scale trials and initial commercial applications in China. She presented this experience as a foundation for 6G, whose commercial

deployment is expected beyond 2030. She also highlighted that future work should identify the gap between the performance required by each use case and what communication-oriented designs can provide. She then turned to sensing signal design, outlining candidates that reuse existing uplink sounding, downlink and positioning signals, enhance their design or introduce dedicated sensing waveforms. Their assessment must consider sensing performance, coexistence with communications and flexibility across scenarios.

Building on signal design, Ms. Du discussed how to configure and report sensing measurements. Options include alignment with existing communication measurement procedures or more independent configuration, while accounting for resource overhead, synchronization errors and interference. Reports could contain information at different processing levels, from raw measurements to point clouds and initial positioning results, together with assistance information. She also described two directions for AI: improving sensing through AI, and using sensing data to support digital twins, AI models and network performance. She emphasized collaboration with other sensing sources to meet diverse application needs. At the network level, she outlined roles for sensing entities, core-network sensing functions and service consumers, while noting that architecture, control and data delivery remain under discussion. Security must protect service requests, measurements and their transmission. Turning to practical experience, she traced trials under the IMT-2030 (6G) Promotion Group from monostatic sensing in 2022 to bistatic, cooperative and AI-assisted approaches, illustrated through environmental reconstruction, low-altitude and indoor sensing. Building on these results, the 2026 trials focus on enhancing sensing over the radio interface, integrating sensing with AI, multiple sources and digital twins, and using sensing to improve communications. Although demand is becoming clearer in low-altitude industries and city monitoring, she noted that a complete business model remains unresolved. Experience from 5G Advanced should therefore help clarify valuable scenarios, target capabilities and research priorities for 6G.

Open Challenges from Panel Discussion 2

The second panel examined what should be standardized first for 6G ISAC and how that work could support viable services. Mr. Xuemin, Wang (Huawei) stressed that technical readiness and standards alone would not establish a viable business model. Drawing on experience with connected vehicles, he noted that AI and computing play a major role in autonomous driving, emphasizing that the commercial value of ISAC must be demonstrated in the industries it aims to serve. Ms. Du, Ying (CAICT) pointed to trial networks and commercial applications in several cities, including coastal monitoring, as signs that demand is becoming clearer. Dr. Robitzsch highlighted the difficulty of securing initial investment when operators need customers before deploying ISAC, while customers need services to be available before buying them. He identified public safety and defense, including airport drone detection, as likely early markets. More demanding 6G applications, such as cm-level sensing involving UEs for home entertainment, would require more time for standardization and to establish customer demand. He therefore stressed early involvement of vertical industries, which he considered insufficient in 5G.

Turning to the first 6G specifications, Ms. Du, Ying highlighted the sensing architecture, core-network functions and the framework for transferring sensing data. At the radio level, priorities include obtaining measurements, triggering sensing and defining reporting procedures. She also emphasized using sensing data to tune AI models and using ISAC to build digital twins of base stations or robots. Dr. Mingyang, Chao (China Unicom) favoured standardizing basic physical-layer capabilities first, while leaving higher-layer applications and services open to innovation. Mr. Xuemin, Wang broadened the discussion to Wi-Fi sensing integrated with AI-capable chips for homes and factories, including reducing energy use in unoccupied areas. He suggested that Wi-Fi sensing could progress sooner than cellular sensing.

The panel then considered how to avoid fragmentation across standards bodies. Dr. Robitzsch explained that 3GPP would define the common 6G specifications, while complementary work in ETSI and IETF would support

data exchange, protocols and services beyond the cellular network. He also cited a demonstration combining cellular sensing with Wi-Fi, LiDAR and cameras to improve the overall sensing service. Ms. Du, Ying described the bodies as having different focuses, including equipment interoperability and higher-level service exposure. However, the boundary between common standards and supplier-specific solutions remained under discussion.

Finally, the discussion addressed how sensing performance claims should be validated. Ms. Du, Ying explained that early metrics draw on radar experience, but their importance varies by application. Testing is progressing from laboratories to outdoor trials and larger deployments, with validation still presenting challenges. Dr. Robitzsch emphasized that agreement across organizations would develop through continued exchanges and consensus, as practical experience clarifies both technical requirements and standardization responsibilities.

Closing Words

In his closing remarks, Prof. Aguiar concluded that ISAC is already feasible in several scenarios, including with 5G, and highlighted two deployment directions: localized applications and wider-area sensing, such as maritime monitoring. He also emphasized the challenges of sensing-data handling and the continuing need to clarify standardization responsibilities, while noting the positive outlook for cooperation among standards bodies. He looked ahead to ISAC becoming essential for operators across multiple use cases as the market responds, the technology matures and practical experience grows.

