



INTERACT

Poznan, Poland, 12-14 September 2023

SUBJECT | Minutes of the 6th Management Committee Meeting of COST Action CA20120 “The Intelligence-Enabling Radio Communications for Seamless Inclusive Interactions (INTERACT)”

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Country	Name	Surname
Ireland	Hamed	Ahmadi
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Netherland	Haibin	Zhang
SUBSTITUTE:	Hong	Zhu

Delivered	TD Number	TD Author	TD Title	TD Abstract	TD WG	TD Data	Nome	Cognome	Email	Acronimo	Notes
Y	TD(23)06053	Adam Samorzewski, Margot Deruyck, Adrian Kliks	Energy Consumption in RES-aware 5G Networks	In this work, the impact of using Renewable Energy Source (RES) generators in next-generation (5G) cellular systems on total power consumption (PC) has been investigated. The paper highlights the gain related to the use of photovoltaic (PV) panels and wind turbines (WTs) in the form of two factors – the average extension of battery lifetime (AEBL) powering a single network cell and the average reduction in energy consumption (AREC) within the whole network. The examination has been conducted for four different seasons of the year and various configurations of available power sources. Provided system scenario was based on real data on weather conditions, buildings placement, and implemented mobile networks for the city of Poznan in Poland. Used RES generators were designed in accordance with the specifications of real devices.	WG1		Adrian	Kliks	adrian.kliks@put.poznan.pl		
Y	TD(23)06052	Marcin Hoffmann, Pawel Kryszkiewicz	Optimization of power amplifier IBO in Massive MIMO Network via Contextual Bandit and Deep Q network	Massive Multiple-Input Multiple-Output (MMIMO) constitutes a pivotal element within the realm of 5G. However, the most of research assumes perfect hardware characteristics. On the other hand, while aiming at high energy efficiency of the transmission the Radio Frequency components operate in a nonlinear regime, e.g., Power Amplifier. In MMIMO system it is possible that the nonlinear distortion will be directed towards the served user, independently from the number of utilized antenna elements. To address this concern, one potential solution involves dynamically adjusting the operational point of the PA, called Input Back-Off (IBO), finding a balance between the desired signal power and the nonlinear distortion power. This research introduces the Contextual Bandit to find the optimum IBO value. The viability of the proposed solution is assessed within a realistic MMIMO cell simulator encompassing various functional components such as precoders and user schedulers, using a precise 3D Ray-Tracing radio channel model. The proposed solution enhances users' throughput in comparison to the state-of-the-art solutions	WG1		Adrian	Kliks	adrian.kliks@put.poznan.pl		
Y	TD(23)06051	Salim Janji, Adrian Kliks	Multi-agent Q-learning for Drone Base Stations	We formulate a drone base stations (DBSs) localization problem that improves the users' received signal-to-interference-plus-noise ratio (SINR) and the fairness between users in terms of receiving sufficient channel quality. In contrast to other works, our algorithm adapts to the actual users distribution on the ground without knowing their locations but rather their channel measurements history. We also leverage the fact that moving a DBS results in reduced aerodynamic energy consumption and illustrate that moving DBSs intelligently at a certain speed actually reduces energy consumption. We propose a multi-agent Q-learning formulation to solve this problem which requires less computation than its single agent counterpart and show by extensive simulations the improvements in terms of system fairness and link reliability relative to the benchmark solutions while leveraging a realistic users mobility model.	WG1		Adrian	Kliks	adrian.kliks@put.poznan.pl		

Y	TD(23)06050	Flor Ortiz, Nicolas Skatchkovsky, Eva Lagunas, Wallace A. Martins, Geoffrey Eappen, Saed Daoud, Osvaldo Simeone, Bipin Rajendran, and Symeon Chatzinotas	Energy-Efficient On-Board Radio Resource Management for Satellite Communications via Neuromorphic Computing	The latest satellite communication (SatCom) missions are characterized by a fully reconfigurable on-board software-defined payload, capable of adapting radio resources to the temporal and spatial variations of the system traffic. As pure optimization-based solutions have shown to be computationally tedious and to lack flexibility, machine learning (ML)-based methods have emerged as promising alternatives. We investigate the application of energy-efficient brain-inspired ML models for on-board radio resource management. Apart from software simulation, we report extensive experimental results leveraging the recently released Intel Loihi 2 chip. To benchmark the performance of the proposed model, we implement conventional convolutional neural networks (CNN) on a Xilinx Versal VCK5000, and provide a detailed comparison of accuracy, precision, recall, and energy efficiency for different traffic demands. Most notably, for relevant workloads, spiking neural networks (SNNs) implemented on Loihi 2 yield higher accuracy, while reducing power consumption by more than 100% as compared to the CNN-based reference platform. Our findings point to the significant potential of neuromorphic computing and SNNs in supporting on-board SatCom operations, paving the way for enhanced efficiency and sustainability in future SatCom systems.	WG1, WG2, WG3		Flor de Guadalupe	ORTIZ GOMEZ	flor.ortiz@uni.lu
Y	TD(23)06049	Fred Wagen and Yann Maret	Small Ad-Hoc MANET: simulations and measurements	From the perspective of a group of users using ad-hoc Vehicular to Vehicular (V2V) or MANET communication, the optimization of radio resources depends on the service or application. Considering the completion ratio for a given user traffic requires to trade-off reliable routes with congestion on these "good" routes. How to optimise routing and scheduling in time varying environments is particularly complex. Datasets are missing to investigate and quantify the performance in realistic scenarios. This TD discuss our experiences with two MANETs: (1) 24 vehicles in the open source Anglora.net scenario and (2) 6 laptops moving by pair in a school building. Multi-user system level simulations and measurements, Delivery Ratio and Goodput using so-called Abstract PHY radio models, are presented to evaluate the interest of the COST INTERACT community in the datasets we plan to provide.	WG1, WG3, HA1		Jean-Frédéric	Wagen	jean-frederic.wagen@hefr.ch
Y	TD(23)06047	Simona Valbonesi, Andrea Garzia, Elena Mammi, Nerea Canales Sebastian, Marcella Di Mario, Mirko Ermini	Ray-tracing simulation of railway station ecosystem in 5G scenario	The railway station environment is complex and characterized by communication needs of different types, which can be satisfied efficiently by modern technology. The specific characteristics of 5G technology make it extremely suitable to support a multitude of use cases including the specific requirements of the railway station ecosystem. For this study, the pioneering band for 5G in the European Union, 3.7 GHz, will be considered. This band represents a good compromise between capacity and coverage; indeed, with these frequencies it is possible to obtain wide coverage, deep indoor environments excluded, and an adequate transmission capacity. The medium band frequencies, therefore, lend themselves to responding to the different requirements of the 5G scenarios. The objective of the current analysis is the evaluation of the coverage of the stations through 5G networks: a calculation methodology based on ray-tracing simulations will be used to analyze the coverage of a railway station by a public 5G network and verify if this coverage can satisfy the diagnostics related use cases and, if necessary, to deploy low/very low power femtocells in strategic points to obtain ubiquitous coverage. The use of femtocells non-public network (NPN) can represent a reliable and scalable solution to any coverage problems in railway station scenarios.	Sub-VT1, VT2	29/08/2023 13:40	Paolo	Grazioso	pgrazioso@FUB

Y	TD(23)06046	A.Frömming, S. Diederich, L. Häring and A. Czylik	Clipping noise mitigation for coherent OFDM systems using decision-aided reconstruction combined with neural networks	This paper introduces a novel algorithm for mitigating clipping noise at the receiver end of a coherent transmission system.	WG2	2023-08-25 22:00:59	Andreas	Czylik	czylik@n	UDE	
Y	TD(23)06045	Michiel Sandra, Christian Nelson, Xuesong Cai, Fredrik Tufvesson, Anders J Johansson	Wideband USRP-based Channel Sounder for Distributed Massive MIMO	In this work, we present the design and implementation of our distributed massive MIMO channel sounder with a bandwidth of 400 MHz, taking the state-of-the-art to the next level. Our design is based on the NI Universal Software Radio Peripheral X410 and utilizes multiple parallel RF chains, each connected to an RF switch, trading off the dynamic capability and cost. The channel sounder also features processing on the FPGA to limit the data stream to the host computer and increase the signal-to-noise ratio. The whole implementation of the sounder is based the open-source USRP Hardware Driver and the RF Network on Chip (RFNoC) framework. Our current implementation is capable of measuring 7686 antenna combinations in 44 ms and has been validated by a demo measurement in our laboratory.	WG1	2023-08-25 16:58:52	Michiel	Sandra	micheel.sai	LUND	
Y	TD(23)06044	S.Kodra , M.Barbiroli , E.M.Vitucci , F. Fuschini , V. Degli Esposti	Mm-wave building penetration losses: A measurement based critical analysis	The limited power-budget is known to be one of the main problems in mm-wave radio links, especially when in-building applications are considered. In particular, outdoor-to-indoor and through-floor attenuation need to be analysed and carefully characterized at mm-waves in order to correctly approach both coverage and interference assessment problems. Surprisingly, only a few studies addressed the problem and no recommendation has been provided by standardization bodies so far for mm-wave through-floor attenuation in different building types. Therefore, a measurement campaigns at 28 and 38 GHz was carried out to investigate the aforementioned issues. It is observed that the in-building losses heavily depend on the building type and that modern construction techniques make through-floor propagation almost impossible. This fact highlights the need for standard models for mmwave through-floor propagation in different kinds of buildings.	WG1,Sub-WG1.1	2023-08-25 15:31:43	Vittorio	Degli-Esposti	v.degliesp	UNIBO	
Y	TD(23)06043	Mohammed Mallik, Benjamin Allaert, Esteban Egea Lopez, Joe Wiart, Davy P. Gaillot and Laurent Clavier	COTANK: A Fast Method to Reconstruct Urban Electromagnetic Field Exposure by Matrix Completion	Electromagnetic field exposure (EMF) has grown to be a critical concern as a consequence of the ongoing installation of fifth-generation cellular networks (5G). The lack of measurements makes it difficult to estimate an electromagnetic field accurately in a specific urban area. Exposure map reconstruction techniques construct these maps from a collection of measurements recorded by spatially distributed sensors where large areas data are missing. To overcome this issue, The exposure map estimation task is addressed as an image inpainting/missing data imputation task. In this work, a matrix completion method using a convolutional neural tangent kernel (COTANK) is proposed to estimate EMF exposure from a few sensor measured values located in an urban environment. Experimental result shows that the kernel adapts to the propagation characteristics of the electromagnetic field from the sensor data producing accurate estimates, and is a promising solution for exposure map reconstruction.	Sub-VT1	2023-08-25 13:37:22	Mohammed	Mallik	mohamme	CNRS	

Y	TD(23)06042	Joonas Kokkonen	Analysis of RIS in Near Field Energies in LOS Channels	The reconfigurable intelligent surfaces (RISs) are expected to be a cheap way to extend service areas of base stations. This is especially promising in the millimeter wave and THz bands (from 30 GHz to +300 GHz) where base station coverage is expected to be modest and suffer greatly from blockages. As the RISs can potentially be large (physically and via number of sub-elements), there is a good chance that a user is in the near field of the RIS. This paper considers RIS near field propagation and achievable power levels close to these surfaces. Ideal energy levels are looked into among with the impact of beamforming and beam squinting. Human safety issues close to these surfaces are also analyzed from the energy density point of view. It is shown that the achievable received power in the near field are very good, but the beam squinting may have a significant impact on the received power and frequency response. We also conclude that RISs are safe for humans even at close proximity due to relatively large channel losses in the reflected channels and hence low power densities in the air.	WG1,Sub-WG1.2	2023-08-25 11:17:50	Joonas	Kokkonen	joonas.kok	OULU
Y	TD(23)06041	Botond Tamás Csathó, Zsolt Badics, József Pávó and Bálint Péter Horváth	Fast Numerical Analysis of Metasurfaces by Characteristic Basis Functions in EFIE Framework	Metasurface-based reconfigurable intelligent surfaces (RIS) are able to actively control the reflection and refraction patterns on a surface to create a programmable and reconfigurable wireless propagation environment. A fast electric field integral equation formulation is developed here to model metasurface-field interactions for RISs. The novelty of the formulation is that it utilizes characteristic basis functions designed specifically for approximating surface current densities on metasurfaces, thereby significantly reducing the necessary number of unknowns and decreasing the solution time compared with employing the standard Method of Moments technique with Rao-Wilton-Glisson surface basis functions. In this work, we validate the novel numerical technique and demonstrate the substantial improvement in numerical performance utilizing a two-dimensional illustrative structure.	WG1,Sub-WG1.2	2023-08-25 10:29:48	Botond Tamas	Csatho	csatho.bot	BME
Y	TD(23)06040	Alister Burr, Abigail Elcock and Junbo Zhao	Bussgang revisited: effect of quantization on signal to distortion plus noise ratio	Quantization plays an important role in the physical layer (PHY) disaggregation which is fundamental to the Open Radio Access Network (O-RAN) architecture, since digitized signals must be transmitted over fronthaul connections. In this paper we explore the effect of quantization on PHY performance, drawing on the Bussgang decomposition and the implications of the Bussgang theorem and extending it to the case of non-Gaussian signals. We first prove several theorems regarding the signal to distortion plus noise ratio for a general non-linearity, applicable to both the Gaussian and the non-Gaussian case, showing that the decomposition can be applied to the non-Gaussian case, but that formulae previously introduced should be amended. We then apply these results to the non-linearity created by quantization, both for Gaussian and non-Gaussian signal distributions, and give numerical results derived from both theory and simulation.	WG2	2023-08-25 10:09:11	Alister	Burr	alister.bur	UOY

Y	TD(23)06039	Remco Heijs, Gerhard Steinböck, Bengt-Erik Olsson, Bengt-Erik Olsson, Bart Smolders	On the Importance of Scattering From Poles in Ray Tracing Simulations	For enhancing the latest mobile networks, a more precise approximation of ray propagation in complex environments is necessary to position the base stations and optimize network performance. The scattering from a cylindrical metallic object, which could represent lampposts, poles of traffic signs or trashcans, is implemented in ray tracing simulations. In this paper, the addition of cylindrical metallic objects in ray tracing simulations is done via analytically derivable radar cross-sections. Furthermore, objects are decomposed to utilize plane wave excitation in the near field of the object. Implementing this approach results in an augmentation in the channel richness and increases the best available path gain. The comparison of simulation results to measurements clearly indicates that poles contribute significantly and should not be ignored in raytracing simulations.	WG1	2023-08-25 07:47:13	Remco	Heijs	r.heijs@st	TUE	
Y	TD(23)06038	Bariş Fındık, Pekka Kyösti, Peize Zhang	A channel model modification for large arrays, large bandwidth, and near-field effects	This document introduces a simple modification to geometry based channel models to incorporate spherical wavefronts, frequency dependent array responses, and frequency dependent Doppler components. These effects may become relevant on large array sizes, large bandwidth, and small link distances. In the proposed modification per antenna propagation distances are determined and used instead of mere phase phase shifts, as is done in most geometry based stochastic models.	WG1	2023-08-25 05:44:08	Pekka	Kyösti	pekka.kyo	KEYSIGHT	
Y	TD(23)06037	Yang Miao, Carsten Smeenk	What is the definition of ISAC from COST INTERACT?	We shall define together our ISAC use case scenarios, channel measurement scenarios, ISAC channel models, ISAC system prototypes, waveform and signal processing pipelines. In this TD, we list a few starting points for discussions, and will prompt the discussions and collaborations for moving towards a joint output for future whitepaper and survey.	Sub-WG2	2023-08-25 01:36:04	Yang	Miao	y.miao@u	UT	
Y	TD(23)06027	Amar Al-Jazri, Jiahao Ju, Sana Salous	Indoor measurements and models for 6G	Frequencies in the sub THz bands are envisaged for future wireless communications. This requires propagation models to predict coverage. The wideband channel sounder at Durham University was recently upgraded to cover the frequency bands 110 to 170 GHz and 235 to 300 GHz. The TD will present results of measurements in typical indoor environments.	WG1	2023-08-24 23:23:52	Sana	Salous	sana.salou	DURHAM	

Y	TD(23)06026	Robin Wydaeghe, Sergei Shikhantsov, Emmeric Tanghe, Günter Vermeeren, Luc Martens, Piet Demeester, Wout Joseph	New Hybrid QuaDRiGa-FDTD Method for Realistic Human Exposure Assessment at 28 GHz with 6G Cell-Free Massive MIMO in 3D Outdoor Environments	<p>A new computational method for realistic exposure assessment is presented for millimeter-wave 5G and 6G networks. For 5G, collocated Multiple-Input-Multiple-Output (MIMO) base stations beamform the signal toward the user and create hotspots of increased exposure. For 6G, cell-free Massive MIMO (MaMIMO) networks use a large number of access points (APs) distributed over the urban landscape. The propagation of the fields through the environment is hybridized with the computation of the exposure on a virtual human. A trajectory from Google Maps between any two addresses in the world is placed in a 3D semantically labeled mesh from Google Earth. In the propagation step, APs are distributed on the faces of buildings using Poisson Disk sampling. This data is used by QuaDRiGa, a powerful quasi-deterministic channel generator, to obtain channel realizations as a function of time.</p> <p>After precoding the signal, the total fields are evaluated on a Huygens surface around the head of a detailed virtual phantom.</p> <p>These form the input to the exposure step, where an FDTD simulation is performed. A post-processing step yields the surface absorbed power density at 28 GHz. The method is applied to a walk through central Helsinki. The range of exposure from a 5G collocated base station is 100 times (20 dB) higher than that of a cell-free MaMIMO network. A precoding gain of up to 20 dB is observed only for the beamforming collocated base station.</p>	WG1,Sub-VT1	2023-08-24 16:31:08	Robin	Wydaeghe	robin.wydaeghe@ugent.be	UGENT
Y	TD(23)06025	Minseok Kim, Riku Takahashi, Anirban Ghosh	Double-Directional Channel Measurements in an Indoor Corridor Scenario at 300 GHz	<p>As commercial deployment of fifth-generation (5G) mobile communication systems using the Sub-6 GHz and 28 GHz millimeter wave bands expands, industry and academia are increasingly changing their attention to the development and realization of next-generation communication systems beyond 5G (B5G). Future mobile networks and other ubiquitous applications are expected to utilize the THz band (100 GHz to 10 THz) due to stringent requirements in terms of data transfer rate, response delay, service reliability, and communication security. This paper presents the double-directional channel measurement campaign conducted in a corridor scenario using the developed 300 GHz channel sounder and the channel characterization results.</p>	WG1,Sub-WG1.1	2023-08-24 12:34:16	Minseok	Kim	mskim@ee.knu.ac.kr	NU
Y	TD(23)06024	Werner G. Teich, Thanawat Thiasiriphet	Chirp-Spreaded OFDM-MFSK with Differentially Encoded Phase for Applications in Low-Power Wide-Area Networks	<p>For the unlicensed frequency bands, long-range wide-area networks (LoRaWAN) is a widespread solution for low-power wide-area networks. The physical layer of LoRaWAN is long range (LoRa) which uses a combination of chirp spread spectrum (CSS) and M-ary frequency-shift keying (M-FSK) for transmission. LoRa is known to be highly robust and well-suited for low-complexity implementation, but the weak aspect is its low spectral efficiency. Orthogonal frequency division multiplexing M-FSK (OFDM-MFSK) is a technique which combines M-FSK with OFDM. The bandwidth is divided into several parallel M-FSK transmissions, i.e., more than one sub-carrier is active at a time. This leads to an increased peak-to-average power ratio of the transmit signal. On the other hand, it allows to combine OFDM-MFSK with differential phase-shift keying (DPSK) to increase the data rate and thus the spectral efficiency. The reception of OFDM-MFSK as well as the DPSK demodulation can be done non-coherently. Therefore, they hold many similar design principles as LoRa. We propose a combination of OFDM-MFSK with differentially encoded phase and CSS. Simulation results show, that LoRa and OFDM-MFSK with CSS show similar performance with respect to power and bandwidth efficiency. Adding DPSK leads to an improved spectral as well as power efficiency.</p>	WG2	2023-08-24 12:07:04	Werner	Teich	werner.teich@uniulm.de	UNIULM

Y	TD(23)06023	Steffen Pahlke, Tommaso Zugno, Mate Boban, Diego Dupleich, Thomas Kürner	Ray tracing and measurement-based characterization of inter/intra-machine THz wireless channels	We make use of channel measurements and ray tracing simulations to characterize wireless propagation at 300 GHz in an industrial environment. We consider two different scenarios representing wireless connections between access points and industrial machines, and between two components inside the same machine. For each scenario, we compute the channel response in terms of power-angle-delay profile and compare the results obtained through measurements and simulations.	WG1,Sub-WG1.1,VT3	2023-08-24 09:41:08	Tommaso	Zugno	tommaso.z	HUAWEI	
Y	TD(23)06022	CheChia Kang, Xin Du, and Jun-ichi Takada	Equivalent Edge Currents based Forward Scattering Prediction for Complex Circumference of the Cross-section of Human Body at 300 GHz Band	The broad bandwidth availability of sub-THz band enables the next generation of mobile systems. Because of the usage of the high-gain antennas, the communication link is highly directive and depends on the line-of-sight (LoS) channel. As one of the main challenges, the LoS channel can be easily shadowed. Due to the short wavelength, even a limb can obstruct the first Fresnel zone and can cause deep fading occasionally. When the obstacle has well-defined edges, the knife-edge diffraction (KED) and the uniform theory of diffraction (UTD) are useful. However, the shape of human body is complex and lacks well-defined edges. This paper aims to propose a channel model based on the windowed equivalent edge currents (EECs) defined by the modified edge representation (MER) for predicting the shadowing gain of the human body with the complex-shaped circumference of the cross-section (CCS).	WG1,Sub-WG1.1	2023-08-24 01:51:45	CheChia	Kang	kang.c.aa@	TITECH	
Y	TD(23)06021	Jaroslav Magiera	Selective jamming of OFDM transmission in NB-IoT radio interface	The paper presents the concept of smart jamming, which involves selective interference aimed at critical components of the OFDM signal. Research verifying the feasibility of this type of electronic attack are described. A realized testbed for jamming real NB-IoT signals in a downlink is presented. The test results demonstrate the feasibility of realizing selective jamming and its greater effectiveness compared to barrage interference.	WG2,VT4	2023-08-23 18:58:27	Jaroslav	Magiera	jaroslav.m	PG	
Y	TD(23)06020	Mar Francis De Guzman, Nuutti Tervo, Pekka Kyösti, Katsuyuki Haneda	Analyses of BeamSpace MIMO Channels at 142 GHz	With the increasing demand for high-speed wireless communication, beamSpace MIMO has emerged as a promising solution to address the high propagation loss and achieve good spectral efficiency in sub-Terahertz frequency band. This paper presents the analyses of a single-user beamSpace MIMO on measured indoor and outdoor channels operating at 142 GHz. The capacity and rank of the system are evaluated under different antenna sizes and number of beams. We assume a total power constraint at the transmitter which results in a decrease in signal-to-noise ratio as the link distance increases. In most cases, the rank especially at short-distance links is considerably high resulting in increased capacity gain of using spatial multiplexing. We also report that the average rank at the farthest link distance considered is approximately 2 and 4 for the small antenna and large antenna cases. Increasing the implementation complexity by enabling a higher number of beams can provide improved rank and hence higher spectral efficiency.	WG1,Sub-WG1.1	2023-08-23 09:19:41	Mar Francis	De Guzman	francis.deg	AALTO	

Y	TD(23)06019	Mar Francis De Guzman, Katsuyuki Haneda	Analysis of Wave-interacting Objects in Indoor and Outdoor Environments at 142 GHz	<p>In this paper, an analysis of wave-object interactions is presented for an entrance hall and on a street of a residential area at 142 GHz. Single-directional channel sounding and the resulting spatio-temporal propagation path estimates are fused with the detailed geometry of the environment through a ray-launcher. The improved ray-launcher accounts for higher-order reflections and realizes high correspondence of the measured paths on the geometry, allowing us to analyze wave-object interaction. In channels without line-of-sight, first and second-order reflections contribute about 60% of the total power. Large interior and exterior walls of buildings are found most influential to the multipath channel. About half of the total received power in some links can be attributed to the reflections on small objects such as pillars and staircases in indoor and lampposts in outdoor cases. While large objects produce most of the clusters to the channel, there are links where small objects generate up to four clusters. The obtained knowledge of wave-object interaction at 142 GHz serves as guidelines to set up site-specific and geometry-based channel modeling at the frequency.</p>	WG1,Sub- WG1.1	2023-08-23 09:15:08	Mar Francis	De Guzman	francis.deg	AALTO	
Y	TD(23)06018	Swarna B. Chetty, Hamed Ahmadi , Avishek Nag	Dynamic Prioritization and Adaptive Scheduling using Deep Deterministic Policy Gradient for Deploying Microservice-based VNFs	<p>—The Network Function Virtualization (NFV)-Resource Allocation (RA) problem is NP-Hard. Traditional deployment methods revealed the existence of a starvation problem, which the researchers failed to recognize. Basically, starvation here, means the longer waiting times and eventual rejection of low-priority services due to a 'time out'.</p> <p>The contribution of this work is threefold: a) explain the existence of the starvation problem in the existing methods and their drawbacks, b) introduce 'Adaptive Scheduling' (AdSch) which is an 'intelligent scheduling' scheme using a three-factor approach (priority, threshold waiting time, and reliability), which proves to be more reasonable than traditional methods solely based on priority, and c) a 'Dynamic Prioritization' (DyPr), allocation method is also proposed for unseen services and the importance of macro- and microlevel priority. We presented a zero-touch solution using Deep Deterministic Policy Gradient (DDPG) for adaptive scheduling and an online-Ridge Regression (RR) model for dynamic prioritization. The DDPG successfully identified the 'Beneficial and Starving' services, efficiently deploying twice as many low-priority services as others, reducing the starvation problem. Our online-RR model learns the pattern in less than 100 transitions, and the prediction model has an accuracy rate of more than 80%.</p>	WG3	2023-08-22 14:10:04	Hamed	Ahmadi	hamed.ah	UOY	

Y	TD(23)06017	Wijdan K. Alsaedi Hamed Ahmadi, Zaheer Khan, and David Grace	Spectrum Options and Allocations for 6G: A Regulatory and Standardization Review	<p>The spectrum management system is expected to operate across a wide range of spectrum that includes not only the bands used by previous generations but also higher frequency bands such as millimeter wave (mmWave), which are currently assigned to fifth generation (5G) networks, terahertz (THz), and optical spectrum. By utilizing a broader range of frequencies, it will be possible to support 6G applications with faster data rates, higher capacity, and lower latency. However, the higher frequency bands pose unique challenges such as higher path loss, absorption loss, and engineering difficulties for antennas and radio frequency (RF) circuitry design, which require advanced technologies and innovative solutions. Given that the spectrum is a scarce resource, efficient management is crucial to ensure the most effective exploitation of frequency bands. The spectrum management has evolved over the years, with different approaches being used to assign and utilize frequency bands. In this paper, we provide a review of spectrum management approaches, including their use in awarding 5G spectrum, and explore their expected use in 6G. We then offer a brief overview of spectrum sharing and its role in enabling the efficient use of spectrum resources. The regulations, standardization, features, limitations, and potential use cases of higher frequency bands such as, mmWave, THz, and visible light (VL)</p>	WG3	2023-08-22 14:06:50	Hamed	Ahmadi	hamed.ahmadi@UOY	
Y	TD(23)06016	Hong Zhu, Alexander Venus, Erik Leitinger, Stefan Tertinek, and Klaus Witrissal	Distributed UWB Signal Processing for Robust and Scalable Positioning	<p>This paper addresses the pivotal challenge of achieving reliable and robust positioning of mobile agents, such as individuals carrying devices, in scenarios where direct line-of-sight (LOS) communication with ultra-wideband (UWB) anchors is obstructed or unavailable. We present a novel approach that combines active LOS measurements from the agent with passive monostatic/bistatic radar measurements, exploiting the human body as an extended blocking object that scatters and attenuates UWB signals during blockages. Our work introduces comprehensive radio channel models for active and passive signals, formulating a Bayesian tracking framework that exploits data association for multiple object-related measurements. Simulations affirm the virtue of our method, demonstrating superior accuracy even during complete LOS outages, outperforming conventional methods reliant solely on direct active measurements. Future direction will extend this framework to accommodate time-varying extent states of the human body as well as kinematic attributes. In conclusion, our proposed joint estimation framework exhibits substantial promise in surmounting obstruction challenges, significantly enhancing localization reliability via radio sensing.</p>	WG1, WG2	2023-08-22 07:34:45	Hong	Zhu	hong.zhu@TUGRAZ	
Y	TD(23)06015	Benjamin Pas, and Pawel Kulakowski	Performance of MAC Protocols for In-Body Terahertz Nano-Networks	<p>In the whole nano-communication research area, energy is a critically important factor, as the tiny nano-nodes must generate energy for themselves. Thus, each communication protocol for nano-networks, especially for in-body scenarios, should be designed very carefully having in mind the energy budget spent for the nano-device operations. In this document, we analyze MAC protocols suitable for in-body nano-networks. We review the existing solutions and validate the most promising ones with computer simulations. The result show that, even in conditions with very limited energy available, three protocols namely: random access, receiver initiated handshake and two-way handshake can obtain satisfactory results.</p>	WG3, VT1	2023-08-18 23:50:45	Pawel	Kulakowski	kulakowski@AGH	

Y	TD(23)06014	Abuu. B. Kihero, Haji. M. Furqan, M. M. Şahin, Huseyin Arslan	6G and Beyond Wireless Channel Characteristics for Physical Layer Security: Opportunities and Challenges	Security has emerged as one of the critical re-quirements in future wireless networks. Unlike traditional cryptography-based security, physical layer security (PLS) tends to exploit various features of the random wireless channel to secure not only the information being communicated but the whole communication process from any type of attack. Due to the limited capability of the legacy wireless networks, only a few channel features could be effectively exploited for PLS. Future wireless networks are envisioned to feature advanced transceiver technologies, signal processing techniques, channel control, and sensing capabilities which will allow them to easily access and extract additional channel features that can be readily exploited for PLS. The novel use cases to be accommodated in future networks are also found to experience some peculiar channel characteristics which also enrich the list of channel features that can be exploited for PLS. This article, thus, tends to highlight the opportunities and potential challenges of these new channel features from the PLS perspective. In the course of the article, the assessment of important qualities while selecting a certain channel feature for the PLS application is discussed. The importance of the channel control concept and sensing technologies for PLS is highlighted. Finally, the paper discusses the challenges and vulnerabilities of the channel-based PLS concept from which future research directions are derived.	WG1	2023-08-14 15:32:39	Hüseyin	ARSLAN	arslan.usf@	IMU	
Y	TD(23)06013	Lianet Méndez-Monsanto Suárez, Manuel José López Morales, Ana García Armada	5G NR BLER-SNR Curves for All Modulation and Coding Schemes under AWGN Channel	This paper contributes by providing a comprehensive set of block error rate (BLER) vs. signal-to-noise ratio (SNR) curves under additive white Gaussian noise (AWGN) channel conditions for every possible modulation and coding schemes (MCS) belonging to 3GPP 5G NR TS 138 214 standard, including low-density parity-check (LDPC) coded and uncoded cases, according to TS 138 212. By providing this extensive dataset, the paper offers valuable insights to assist in the selection of the most appropriate MCS depending on the required BLER-SNR scenario, serving as a guiding tool in the design of 5G NR communication systems.	WG2	2023-08-07 19:47:02	Lianet	Méndez-Monsanto Suárez	100384024	UC3M	
Y	TD(23)06012	Tamara Skoric and Dragana Bajic	Stress level detection based on capacitive electrocardiogram signals of driving subjects	The automotive industry as well as the scientific community are making efforts to develop innovative solutions that would increase the safety of drivers and children in cars, as well as comfort and services that facilitate driving itself. This study investigates the ability to classify different stress levels during driving based on capacitive electrocardiogram signals (cECG) recorded unobtrusively. The proposed machine-learning model extracted only three features, based on the detection of the R peak (the local maximum of the ECG signal), that can be the most reliably detected characteristic point in the inferior quality of unobtrusively recorded cECG. The proposed method was validated on three open data sets recorded during driving: ECG recorded by electrodes with direct contact with skin; cECG recorded without direct skin contact through clothes by capacitive electrodes built into a portable multi-modal cushion; and cECG recorded through the clothes without direct skin contact by capacitive electrodes built into a car seat. Obtained results are comparable to or better than state-of-the-art ML models that use as input, either the complete ECG time series or features extracted based on feature points (PQRST complex).	VT1	2023-08-07 08:47:53	Tamara	Skoric	tamara.ce	UNS	

Y	TD(23)06011	Grega Morano, Aleš Simončič, Teodora Kocavska, Tomaž Javornik, Andrej Hrovat	Angle of Arrival Estimation Using IEEE 802.15.4 TSCH Protocol	Wireless localization and sensing functions play a crucial role in facilitating collaboration and interaction between people and machines in Industry 5.0. Driven by the Integrated Sensing and Communication (ISAC) paradigm, we modify the Time Slotted Channel Hopping (TSCH) protocol to support Angle of Arrival (AoA) estimation, enabling joint localization and communication functionalities. The TSCH timeslot is extended allowing the AoA to be estimated with each received packet. In order to improve the accuracy of the AoA estimates and enable estimation even at high Carrier Frequency Offset (CFO), we propose a two-stage CFO calibration method. The operation of the proposed solution is validated in an indoor scenario utilizing low-cost off-the-shelf components. By utilizing 16 successive AoA estimates with a Round Robin antenna switching pattern, the standard deviation and the mean absolute error are on average below 1.7°	Sub-WG2	2023-08-01 08:53:22	Tomaž	Javornik	tomaz.javornik@ijs.si		
Y	TD(23)06010	Hamed Radpour, Markus Hofer, Lukas Walter Mayer, Andreas Hofmann, Martin Schiefer, and Thomas Zemen	Active Reconfigurable Intelligent Surface for the Millimeter-Wave Frequency Band: Design and Measurement Results	Reconfigurable intelligent surfaces (RISs) will play a key role to establish reliable low-latency millimeter wave (mmWave) communication links for indoor automation and control applications. In case of a blocked line-of-sight between the base station (BS) and the user equipment (UE), a RIS mounted on a wall or on the ceiling enables a bypass for the radio communication link. In this work we present an active RIS for the mmWave frequency band. Each RIS element uses a field effect transistor (FET) to amplify the reflected signal and an orthogonal polarization transformation to increase the isolation between impinging and reflected radio wave. By switching the bias voltage at gate and drain of the FET we can establish four states for each RIS element: two reflection states with different phase shifts, an active amplification and an off state. The RIS field patterns obtained by numerical simulations and by empirical measurements in an anechoic chamber are compared. We show numerical results of the active RIS with 37 patch antenna elements arranged in a hexagonal grid for a center frequency of 25.8 GHz. We can show an improvement of the received power by 12 dB in the active mode of the RIS compared to the reflective mode.	Sub-WG1.2	2023-07-27 15:07:51	Thomas	Zemen	thomas.zemen@ait.ac.at		
Y	TD(23)06004	Nila bagheri, Bahram Khan, Emanuel Teixeira and Fernando J. Velez	Fractal Patch Antenna based on Crystal Photonic applied to Intelligent Transportation Systems in the 40 GHz Millimeter Waveband	5G (and beyond) has very high bandwidth, short latency, better quality of service, and the right amount of capacity. Technological breakthroughs in mobile communication systems user equipments operating in the millimeter wavebands imply a high gain to compensate the effect of path loss. In this work, a novel photonic crystal-based microstrip patch antenna array with high gain is designed to be used in the next generation intelligent transportation systems, e.g., V2X, and other exciting applications. The Photonic Band Gap (PBG) structure and Finite Element Method were considered. By using the High Frequency Structure Simulation (HFSS) software, a fractal microstrip patch antenna operating in the U-band of the electromagnetic spectrum is conceived and modeled on a two-dimensional photonic crystal. The use of the PBG structure improves the antenna's gain and bandwidth, while the antenna's fractal form decreases its size and improves its input impedance. The operational frequency range is 41.72-45.12 GHz with a resonant band centered at 43.26 GHz. The proposed antenna is comprised of a 0.45 mm thick copper ground plane, a 0.9 mm thick FR-4 epoxy substrate with a relative transmittance of 4.4, and a 0.45 mm thick copper antenna patch. The achieved frequency band gain is 8.95 dBi.	WG1,VT2	2023-07-26 19:19:27	Fernando José	VELEZ	fjv@ubi.pt		UBI

Y	TD(23)06003	Adrian Fernandez Carnicero, Anja K. Skrivervik	Dielectric permittivity characterization of biological solutions for implantable antenna design	Miniaturization techniques enables the use of antennas in sensing systems at cellular and molecular level due to its reduced size. In this kind of systems, the implanted sensors are usually surrounded by a lossy biological medium which affects antenna behaviour. For reaching the best performance of the implanted antenna, the effect of the medium needs to be electrically characterized and considered during the design process. This paper presents the electrical characterization of some biological solutions which are generally used in sensing systems at cellular and molecular level: Phosphate-Buffered Saline (PBS), Dulbecco's Modified Eagle Medium (DMEM) and Dulbecco's Modified Eagle Medium with 10% Fetal Bovine Serum (DMEM + 10% FBS). Measurement results of these water-based mediums from 0.2 to 20 GHz using an open-air coaxial probe are performed and presented in this work. Moreover, the complex permittivity variation with temperature is measured and compared with the values of water. Finally, the parameters of the two-pole Cole-Cole model are extracted for each biological medium and for every temperature combination. The calculated Cole-Cole theoretical curves can be used in the antenna design process.	VT1	2023-07-20 07:16:05	Anja	Skrivervik	anja.skrive	EPFL	
Y	TD(23)06002	Diego Dupleich, Alexander Ebert, Yanneck Völker-Schöneberg, Damir Sitdikov, Mate Boban, Lutfi Samara, Giovanni Del Galdo, Reiner Thomä	Characterization of Propagation in an Industrial Scenario from Sub-6 GHz to 300 GHz	We perform simultaneous multi-band ultra-wideband dual-polarized double-directional measurements at sub-6 GHz (center frequency, 6.75 GHz), mmWave (74.25 GHz), and sub-THz (305.27 GHz) in line of sight (LOS) and non-LOS in a small industrial scenario (machine room). The aim is to characterize the propagation at THz taking as a reference the lower bands and identifying shared and distinguishing features. The spatial/temporal analysis of the measurements shows strong similarities in multiparty components between the different bands. Moreover, high order reflections have been identified at THz. Overall, the results indicate that THz channels exhibit significant multi-path, with some specular MPCs unique to the band and with lower contribution by the diffuse components. Finally, path-loss has also been computed and compared with existing multi-band models.	WG1,Sub-WG1.1,VT3	2023-07-15 08:38:36	Diego	Dupleich	diego-and	TUIL	
Y	TD(23)06001	Jose-Maria Molina Garcia-Pardo, Davy Gaillot, M. T. Martinez-Ingles, Juan Pascual and Ismail Benmabrouk	Initial Results on Virtual and Directional Channel Sounding at mmW	Abstract— This TD presents preliminary results on a measurement campaign at mmW, where 2D-virtual arrays and 3D-directional sounding are performed in the same positions, to investigate the accuracy of both approaches by comparing them with ray tracing. Measurements are performed in an indoor environment in the university, from 26 to 40 GHz.	WG1,Sub-WG1.1	2023-07-14 11:32:05	Jose-Maria	Molina-Garcia-Pardo	josemaria,	UPCT	

Monday 11/09

13:30 Welcome

14:00	Training Session
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15:30 Coffee break

16:00	Training Session
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17:30

Room 121

18:00	SC meeting
19:30	

Tuesday 12/09

08:30 Welcome
Room 123

09:00	PLENARY (Room 123)
	Management Committee meeting General Information

10:30 Coffee break

11:00	PLENARY (Room 123)
	Keynote: Marcin Dryjanski Recent Advances in O-RAN
	Discussion: Mate Boban, Vittorio Degli-Esposti White paper on Channel modeling

12:30 Lunch

	Room 123	Room 122	Room 128
14:00	VT4+WG1	SW21-SW11	VT1
	Cuty/Buildings	ISAC & Channel	Health
	19	22	12
	44	25	3
	1		15
	Disc VT4	Disc SW21	Disc VT1

15:30 Coffee break

	Room 123	Room 122	Room 128
16:00	VT3+SW11	WG2	SVT11
	IIoT / Channels	Localisation	EMF
	23	16	43
	2	11	26
	Disc VT3	Disc WG2 LOC	Disc SVT11

17:30

18:30

Wednesday 13/09

08:30 Welcome
Room 123

09:00	Single session (Room 123)	
	17	Spectrum Options and Allocations for 6G
	14	Channel & Physical Layer Security
	37	ISAC Definition

10:30 Coffee break

	Room 123	Room 122	Room 128
11:00	SW12	WG1-WG2	WG3-VT2
	RIS	MIMO	RRM
	42	45	53
	41	20	18
	10	52	49
	Disc SW12		

12:30 Lunch

	Room 123	Room 122	Room 128
14:00	WG1	WG2	VT2 (WG3)
	Channels	PHY Layer	Mobility
	47	46	4
	39	40	50
	38	24	51
	27		Disc VT2

15:30 Coffee break

	Room 123	Room 122	Room 128
16:00	WG1	WG2 - SW21	WG3
	Channels	PHY Layer	Radio Access
		21	
		13	
	Disc WG1 & SW11 White Paper	Disc WG2 Next White Paper	Disc WG3

17:30

17:30	Newsletter meeting
	Departure to social event and dinner

Thursday 14/09

08:30 Welcome
Room 123

09:00	PLENARY (Room 123)	
	Keynote	Dr. Jim Lansford IEEE 802.11 standards
10:00	Keynote	Tommy Svensson HEXA-X-II: challenges and perspective

11:00

Room 123

11:30	PLENARY (Room 123)	
	Management Committee meeting	

13:00 Lunch

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MEETING ATTENDANCE LIST OF (6TH MC AND TECHNICAL MEETING - 11/09/2023)

The attendance list provides the names of the participants who confirmed attendance via their personal e-COST invitation link.

Meeting Title: 6th MC and Technical Meeting

Meeting Reference: E-COST-MEETING-CA20120-110923-5b827e8a

Action Number: CA20120

Meeting Administrator: Flaminia Saratti

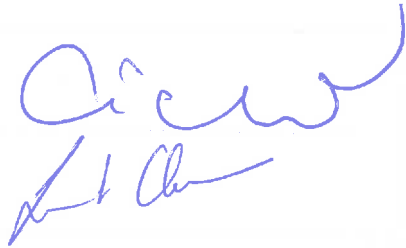


E-mail: flaminia.saratti@unibo.it

- Other - Training Day (Start Date: 11/09/2023 End Date: 11/09/2023)
- Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)

Nr	Participant	Country	Signature	Is Attending
1	ahmadi, hamed hamed.ahmadi@ucd.ie	UK		Yes
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3	Alexandru, Marian marian.alexandru@unitbv.ro	RO		
4	Ambroziak, Slawomir slawomir.ambroziak@pg.edu.pl	PL		Yes
5	ARSLAN, Hüseyin arслан.usf@gmail.com	TR		Yes
6	Bagheri, Nila nila.bagheri@ubi.pt	PT		
7	Bajić, Dragana dragana.bajic@gmail.com	RS		Yes
8	Berbakov, Lazar lazar.berbakov@pupin.rs	RS		
9	Bitó, Janos bito.janos@vik.bme.hu	HU		Yes
10	Blazek, Thomas thomas.blazek@silicon-austria.com	AT		






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- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
11	Bobari, Mate mate.boban@huawei.com	DE		
12	Bota, Vasile Vasile.Bota@com.utcluj.ro	RO		Yes
13	Brennan, Conor conor.brennan@dcu.ie	IE		
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17	Castelló Palacios, Sergio sercasp@iteam.upv.es	ES		
18	Chatzimisios, Periklis pchatzimisios@ihu.gr	EL		Yes
19	Chatzinotas, Symeon schatzin@ieee.org	LU		
20	Cichoń, Krzysztof krzysztof.cichon@put.poznan.pl	PL		Yes
21	Clavier, Laurent laurent.clavier@imt-nord-europe.fr	FR		Yes
22	Conrat, Jean-Marc jeanmarc.conrat@orange.com	FR		Yes
23	Correia, Luis M luis.m.correia@tecnico.ulisboa.pt	PT		Yes
24	Csatho, Botond Tamas csatho.botond@edu.bme.hu	HU		



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- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
25	Czapiewska, Agnieszka agnieszka.czapiewska@pg.edu.pl	PL		Yes
26	Czylwik, Andreas czylwik@nts.uni-duisburg-essen.de	DE		Yes
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28	De Guzman, Mar Francis francis.deguzman@aalto.fi	FI		Yes
29	Degli-Esposti, Vittorio v.degliestposti@unibo.it	IT		Yes
30	Deruyck, Margot margot.deruyck@ugent.be	BE		Yes
31	Di Cicco, Nicola nicola.dicicco@polimi.it	IT		
32	Di Renzo, Marco marco.di-renzo@universite-paris-saclay.fr	FR		
33	Dittmann, Lars ld@com.dtu.dk	DK		
34	Dryjanski, Marcin marcin.dryjanski@rimedolabs.com	n/a		Yes
35	Dupleich, Diego diego-andres.dupleich@tu-ilmenau.de	DE		Yes
36	Ekman, Torbjörn torbjorn.ekman@ntnu.no	NO		Yes
37	Fan, Wei wfa@es.aau.dk	DK		
38	Fortes Rodríguez, Sergio sfr@ic.uma.es	ES		



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- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
39	Gaillot, Davy davy.gaillot@univ-lille.fr	FR		Yes
40	Garcia-Pardo, Concepcion cgpardo@iteam.upv.es	ES		Yes
41	Gardasevic, Gordana gordana.gardasevic@etf.unibl.org	BA		
42	Grazioso, Paolo pgrazioso@fub.it	IT		Yes
43	Haddad, Yoram haddad@g.jct.ac.il	IL		
44	Hannotier, Cédric cedric.hannotier@ulb.be	BE		
45	Heijs, Remco r.heijs@student.tue.nl	NL		Yes
46	Hoffmann, Marcin marcin.ro.hoffmann@doctorate.put.poznan.pl	PL		
47	Horvath, Balint horvath.balint@vik.bme.hu	HU		
48	Hristov, Atanas atanas.hristov@uist.edu.mk	MK		Yes
49	Iradier, Eneko eneko.iradier@ehu.eus	ES		
50	Ivashina, Marianna marianna.ivashina@chalmers.se	SE		
51	Janji, Salim salim_janji@hotmail.com	PL		
52	Javornik, Tomaž tomaz.javornik@ijs.si	SI		Yes





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- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
53	Johansson, Anders J ajj@eit.lth.se	SE		
54	Joseph, Wout wout.joseph@ugent.be	BE		Yes
55	Kang, CheChia kang.c.aa@m.titech.ac.jp	JP		
56	Katzis, Konstantinos K.Katzis@euc.ac.cy	CY		Yes
57	Keerativoranan, Nopphon nopphon.keerativoranan@ap.ide.titech.ac.jp	JP		
58	Khan, Aamir Ullah aamir-ullah.khan@tu-ilmenau.de	DE		
59	Kim, Minseok mskim@eng.niigata-u.ac.jp	JP		
60	Kliks, Adrian adrian.kliks@put.poznan.pl	PL		Yes
61	Kocan, Enis enisk@ucg.ac.me	ME		
62	Kokkonniemi, Joonas joonas.kokkonniemi@oulu.fi	FI		
63	Kotterman, Wim wim.kotterman@tu-ilmenau.de	DE		
64	Kulakowski, Pawel kulakowski@agh.edu.pl	PL		Yes
65	Kürner, Thomas kuerner@ifn.ing.tu-bs.de	DE		
66	Kyösti, Pekka pekka.kyosti@keysight.com	FI		



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- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
67	Lager, Ioan Ernest i.e.lager@tudelft.nl	NL		Yes
68	Lagunas, Eva eva.lagunas@uni.lu	LU		
69	Lansford, Jim jim.lansford@ieee.org	n/a		
70	Lehne, Per Hjalmar per-hjalmar.lehne@telenor.com	NO		
71	Lipovac, Adriana adriana.lipovac@unidu.hr	HR		Yes
72	Lukac, Jozef lukacjo1@fel.cvut.cz	CZ		
73	Machaj, Juraj juraj.machaj@feit.uniza.sk	SK		
74	Magiera, Jaroslaw jaroslaw.magiera@pg.edu.pl	PL		
75	Mallik, Mohammed mohammed.mallik.etu@univ-lille.fr	FR		
76	Mao, Kai maokai@nuaa.edu.cn	CN		
77	Marsalek, Roman marsaler@vut.cz	CZ		Yes
78	Méndez-Monsanto Suárez, Lianet 100384026@alumnos.uc3m.es	ES		
79	Miao, Yang y.miao@utwente.nl	NL		
80	Micó, Sergio sermiro@teleco.upv.es	ES		





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- **Other - Training Day (Start Date: 11/09/2023 End Date: 11/09/2023)**
- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
81	Mikhaylov, Konstantin konstantin.mikhaylov@oulu.fi	FI		Yes
82	Mlinar, Tomi tomi.mlinar@fe.uni-lj.si	SI		
83	Molina-Garcia-Pardo, Jose-Maria josemaria.molina@upct.es	ES		Yes
84	Muzaffar, Raheeb raheeb.muzaffar@silicon-austria.com	AT		
85	Myint, Saw James saw-james.myint@tu-ilmenau.de	DE		
86	Orozco, Luis luis.oroasco@uclm.es	ES		
87	Ortiz, Flor flor.ortiz@uni.lu	LU		
88	Ozdemir, Mehmet Kemal mkozdemir@medipol.edu.tr	TR		
89	Pahlke, Steffen s.pahlke@tu-braunschweig.de	DE		
90	Papaj, Ján jan.papaj@tuke.sk	SK		
91	Pedersen, Troels troels@es.aau.dk	DK		
92	Pejanovic-Djurisic, Milica milica@ucg.ac.me	ME		Yes
93	Rudd, Richard richard.rudd@plumconsulting.co.uk	UK		
94	Rumney, Moray moray@rumneytelecom.com	UK		




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- **Other - Training Day (Start Date: 11/09/2023 End Date: 11/09/2023)**
- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
95	Salous, Sana sana.salous@durham.ac.uk	UK		Yes
96	Samorzewski, Adam adam.samorzewski@doctorate.put.poznan.pl	PL		
97	Sandra, Michiel michiel.sandra@eit.lth.se	SE		
98	Saratti, Flaminia flaminia.saratti@unibo.it	IT		Yes
99	Sarrazin, Julien julien.sarrazin@sorbonne-universite.fr	FR		Yes
100	Sayrafian, Kamran kamran.sayrafian@nist.gov	US		Yes
101	Schiffarth, Anna-Malin schiffarth@ihf.rwth-aachen.de	DE		
102	Schneider, Christian christian.schneider@tu-ilmenau.de	DE		
103	Shah, Syed Najaf Haider syed-najaf-haider.shah@tu-ilmenau.de	DE		
104	Skachek, Vitaly vitaly.skachek@gmail.com	EE		Yes
105	Skocaj, Marco marco.skocaj@unibo.it	IT		
106	Skoric, Tamara tamara.ceranic@gmail.com	RS		
107	Skrivervik, Anja anja.skrivervik@epfl.ch	CH		Yes
108	Smeenk, Carsten carsten.smeenk@iis.fraunhofer.de	DE		Yes




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- **Other - Training Day (Start Date: 11/09/2023 End Date: 11/09/2023)**
- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
109	Sommerkorn, Gerd som@tu-ilmenau.de	DE		
110	Stojkoska, Biljana biljanastojkoska@yahoo.com	MK		Yes
111	Svensson, Tommy tommy.svensson@chalmers.se	n/a		
112	Sykora, Jan jan.sykora@fel.cvut.cz	CZ		Yes
113	Taramit, Hamid hamid.taramit@alu.uclm.es	ES		Yes
114	Teich, Werner werner.teich@uni-ulm.de	DE		
115	Thomä, Reiner reiner.thomae@tu-ilmenau.de	DE		
116	Timcenko, Valentina valentina.timcenko@pupin.rs	RS		Yes
117	Torres, Renato rbotorres93@gmail.com	ES		
118	Torrìco, Saul storrìco@gwu.edu	US		
119	Vassiliou, Vasos vasosv@ucy.ac.cy	CY		
120	VELEZ, Fernando José fjv@ubi.pt	PT		Yes
121	Verdone, Roberto roberto.verdone@unibo.it	IT		
122	Villaescusa Tébar, Álvaro alvilte1@teleco.upv.es	ES		

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- **Other - Training Day (Start Date: 11/09/2023 End Date: 11/09/2023)**
- **Core Group - Core Group Meeting (Start Date: 11/09/2023 End Date: 11/09/2023)**

Nr	Participant	Country	Signature	Is Attending
123	Wagen, Jean Frederic jfowagen@gmail.com	CH		Yes
124	Wydaeghe, Robin robin.wydaeghe@ugent.be	BE		Yes
125	Zammit, Joseph A. joseph.a.zammit@mcast.edu.mt	MT		
126	Zanaj, Elma ezanaj@fti.edu.al	AL		
127	Zemen, Thomas thomas.zemen@ait.ac.at	AT		Yes
128	Zentner, Radovan radovan.zentner@fer.hr	HR		
129	Zhang, Haibin haibin.zhang@tno.nl	NL		Yes
130	Zhang, Peize peize.zhang@oulu.fi	FI		
131	Zhu, Hong hong.zhu@tugraz.at	AT		
132	zhu, qiuming zhuqiuming@nuaa.edu.cn	CN		
133	Ziganshin, Ainur ainur.ziganshin@tu-ilmenau.de	DE		
134	Zugno, Tommaso tommaso.zugno@huawei.com	DE		

Country Codes: Albania (AL), Austria (AT), Belgium (BE), Bosnia and Herzegovina (BA), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Iceland (IS), Ireland (IE), Israel (IL), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Montenegro (ME), The Netherlands (NL), the North Republic of Macedonia (MK), Norway (NO), Poland (PL), Portugal (PT), The Republic of Moldova (MD), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR), United Kingdom (UK).

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Meeting Secretary

(Chair or local organiser)

Name + signature

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MEETING ATTENDANCE LIST OF (6TH MC AND TECHNICAL MEETING - 12/09/2023)

The attendance list provides the names of the participants who confirmed attendance via their personal e-COST invitation link.

Meeting Title: 6th MC and Technical Meeting




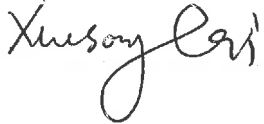


Meeting Reference: E-COST-MEETING-CA20120-110923-5b827e8a

Action Number: CA20120

Meeting Administrator: Flaminia Saratti

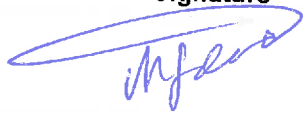






E-mail: flaminia.saratti@unibo.it

- Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)
- Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)

Nr	Participant	Country	Signature	Is Attending
1	ahmadi, hamed hamed.ahmadi@ucd.ie	UK		Yes
2	Bagheri, Nila nila.bagheri@ubi.pt	PT		Y
3	Blazek, Thomas thomas.blazek@silicon-austria.com	AT		
4	Boban, Mate mate.boban@huawei.com	DE		Y
5	Cai, Xuesong xuesong.cai@eit.lth.se	SE		
6	Castelló Palacios, Sergio sercaspa@iteam.upv.es	ES		
7	Cichoń, Krzysztof krzysztof.cichon@put.poznan.pl	PL		Yes
8	Conrat, Jean-Marc jeanmarc.conrat@orange.com	FR		Yes
9	Csatho, Botond Tamas csatho.botond@edu.bme.hu	HU		YES
10	d'Orey, Pedro pdorey@fe.up.pt	PT		





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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
11	De Guzman, Mar Francis francis.deguzman@aalto.fi	FI		Yes
12	Degli-Esposti, Vittorio v.degliesposti@unibo.it	IT		Yes
13	Di Cicco, Nicola nicola.dicicco@polimi.it	IT		
14	Di Renzo, Marco marco.di-renzo@universite-paris-saclay.fr	FR		
15	Dryjanski, Marcin marcin.dryjanski@rimedolabs.com	n/a		Yes
16	Dupleich, Diego diego-andres.dupleich@tu-ilmenau.de	DE		Yes
17	Fan, Wei wfa@es.aau.dk	DK		
18	Fortes Rodríguez, Sergio sfr@ic.uma.es	ES		
19	Grazioso, Paolo pgrazioso@fub.it	IT		Yes
20	Hannotier, Cédric cedric.hannotier@ulb.be	BE		
21	Heijs, Remco r.heijs@student.tue.nl	NL		Yes
22	Hoffmann, Marcin marcin.ro.hoffmann@doctorate.put.poznan.pl	PL		
23	Iradier, Eneko eneko.iradier@ehu.eus	ES		
24	Janji, Salim salim_janji@hotmail.com	PL		






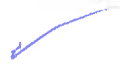



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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
25	Johansson, Anders J ajn@eit.lth.se	SE		
26	Joseph, Wout wout.joseph@ugent.be	BE		Yes
27	Kang, CheChia kang.c.aa@m.titech.ac.jp	JP	CHECHIA KANG	
28	Keerativoranan, Nopphon nopphon.keerativoranan@ap.ide.titech.ac.jp	JP		
29	Khan, Aamir Ullah aamir-ullah.khan@tu-ilmenau.de	DE		
30	Kim, Minseok mskim@eng.niigata-u.ac.jp	JP		
31	Kliks, Adrian adrian.kliks@put.poznan.pl	PL		Yes
32	Kokkonniemi, Joonas joonas.kokkonniemi@oulu.fi	FI		
33	Kotterman, Wim wim.kotterman@tu-ilmenau.de	DE		
34	Kyösti, Pekka pekka.kyosti@keysight.com	FI		
35	Lansford, Jim jim.lansford@ieee.org	n/a		
36	Lukac, Jozef lukacjo1@fel.cvut.cz	CZ		
37	Magiera, Jarosław jaroslaw.magiera@pg.edu.pl	PL	Jarosław Magiera	
38	Mallik, Mohammed mohammed.mallik.etu@univ-lille.fr	FR		







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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
39	Mao, Kai maokai@nuaa.edu.cn	CN		
40	Marsalek, Roman marsaler@vut.cz	CZ		Yes
41	Méndez-Monsanto Suárez, Lianet 100384026@alumnos.uc3m.es	ES		
42	Miao, Yang y.miao@utwente.nl	NL		
43	Micó, Sergio sermiro@teleco.upv.es	ES		
44	Mlinar, Tomi tomi.mlinar@fe.uni-lj.si	SI		
45	Muzaffar, Raheeb raheeb.muzaffar@silicon-austria.com	AT		
46	Myint, Saw James saw-james.myint@tu-ilmenau.de	DE		
47	Orozco, Luis luis.orozco@uclm.es	ES		
48	Ortiz, Flor flor.ortiz@uni.lu	LU		
49	Pahlke, Steffen s.pahlke@tu-braunschweig.de	DE		
50	Rudd, Richard richard.rudd@plumconsulting.co.uk	UK		
51	Rumney, Moray moray@rumneytelecom.com	UK		
52	Samorzewski, Adam adam.samorzewski@doctorate.put.poznan.pl	PL		

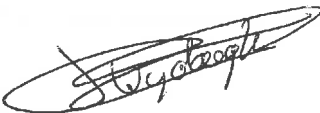


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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
53	Sandra, Michiel michiel.sandra@eit.lth.se	SE		
54	Sayrafian, Kamran kamran.sayrafian@nist.gov	US		Yes
55	Schiffarth, Anna-Malin schiffarth@ihf.rwth-aachen.de	DE		
56	Schneider, Christian christian.schneider@tu-ilmenau.de	DE		
57	Shah, Syed Najaf Haider syed-najaf-haider.shah@tu-ilmenau.de	DE		
58	Skocaj, Marco marco.skocaj@unibo.it	IT		
59	Skoric, Tamara tamara.ceranic@gmail.com	RS		
60	Smeenk, Carsten carsten.smeenk@iis.fraunhofer.de	DE		Yes
61	Sommerkorn, Gerd som@tu-ilmenau.de	DE		
62	Svensson, Tommy tommy.svensson@chalmers.se	n/a		
63	Taramit, Hamid hamid.taramit@alu.uclm.es	ES		Yes
64	Teich, Werner werner.teich@uni-ulm.de	DE		Yes
65	Thomä, Reiner reiner.thomae@tu-ilmenau.de	DE		
66	Timcenko, Valentina valentina.timcenko@pupin.rs	RS		Yes









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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
67	Torres, Renato rbertorres93@gmail.com	ES		
68	Torrìco, Saul storrìco@gwu.edu	US		
69	Villaescusa Tébar, Álvaro alvilte1@teleco.upv.es	ES		
70	Wydaeghe, Robin robin.wydaeghe@ugent.be	BE		Yes
71	Zhang, Peize peize.zhang@oulu.fi	FI		
72	Zhu, Hong hong.zhu@tugraz.at	AT	<i>Hong Zhu</i>	
73	zhu, qiuming zhuqiuming@nuaa.edu.cn	CN		
74	Ziganshin, Ainur ainur.ziganshin@tu-ilmenau.de	DE		
75	Zugno, Tommaso tommaso.zugno@huawei.com	DE		
76	Aleksiejūnas, Rimvydas rimvydas.aleksiejunas@ff.vu.lt	LT		
77	Alexandru, Marian marian.alexandru@unitbv.ro	RO		
78	Ambroziak, Sławomir slawomir.ambroziak@pg.edu.pl	PL		Yes
79	ARSLAN, Hüseyin arслан.usf@gmail.com	TR	<i>H. Arslan</i>	Yes
80	Bajić, Dragana dragana.bajic@gmail.com	RS		Yes







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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
81	Berbakov, Lazar lazar.berbakov@pupin.rs	RS		
82	Bito, Janos bito.janos@vik.bme.hu	HU		Yes
83	Bota, Vasile Vasile.Bota@com.utcluj.ro	RO		Yes
84	Brennan, Conor conor.brennan@dcu.ie	IE		
85	Buratti, Chiara c.buratti@unibo.it	IT		
86	Burr, Alister alister.burr@york.ac.uk	UK		Yes
87	Chatzimisios, Periklis pchatzimisios@ihu.gr	EL		Yes
88	Chatzinotas, Symeon schatzin@ieee.org	LU		
89	Clavier, Laurent laurent.clavier@imt-nord-europe.fr	FR		Yes
90	Correia, Luis M luis.m.correia@tecnico.ulisboa.pt	PT		Yes
91	Czapiewska, Agnieszka agnieszka.czapiewska@pg.edu.pl	PL		Yes
92	Czylwik, Andreas czylwik@nts.uni-duisburg-essen.de	DE		Yes
93	Deruyck, Margot margot.deruyck@ugent.be	BE		Yes
94	Dittmann, Lars ld@com.dtu.dk	DK		







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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
95	Ekman, Torbjörn torbjorn.ekman@ntnu.no	NO		Yes
96	Gaillot, Davy davy.gaillot@univ-lille.fr	FR		Yes
97	Garcia-Pardo, Concepcion cgpardo@iteam.upv.es	ES		Yes
98	Gardasevic, Gordana gordana.gardasevic@etf.unibl.org	BA		
99	Haddad, Yoram haddad@g.jct.ac.il	IL		
100	Horvath, Balint horvath.balint@vik.bme.hu	HU		
101	Hristov, Atanas atanas.hristov@uist.edu.mk	MK		Yes
102	Ivashina, Marianna marianna.ivashina@chalmers.se	SE		
103	Javornik, Tomaž tomaz.javornik@ijs.si	SI		Yes
104	Katzis, Konstantinos K.Katzis@euc.ac.cy	CY		Yes
105	Kocan, Enis enisk@ucg.ac.me	ME		
106	Kulakowski, Paweł kulakowski@agh.edu.pl	PL		Yes
107	Kürner, Thomas kuerner@ifn.ing.tu-bs.de	DE		
108	Lager, Ioan Ernest i.e.lager@tudelft.nl	NL		Yes







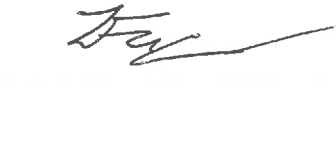



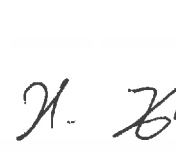
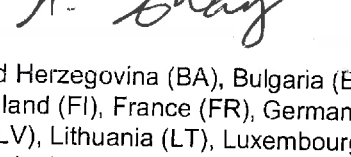
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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
109	Lagunas, Eva eva.lagunas@uni.lu	LU		
110	Lehne, Per Hjalmar per-hjalmar.lehne@telenor.com	NO		
111	Lipovac, Adriana adriana.lipovac@unidu.hr	HR		Yes
112	Machaj, Juraj juraj.machaj@feit.uniza.sk	SK		
113	Mikhaylov, Konstantin konstantin.mikhaylov@oulu.fi	FI		Yes
114	Molina-Garcia-Pardo, Jose-Maria josemaria.molina@upct.es	ES		Yes
115	Ozdemir, Mehmet Kemal mkozdemir@medipol.edu.tr	TR		
116	Papaj, Ján jan.papaj@tuke.sk	SK		
117	Pedersen, Troels troels@es.aau.dk	DK		
118	Pejanovic-Djurisic, Milica milica@ucg.ac.me	ME		Yes
119	Salous, Sana sana.salous@durham.ac.uk	UK		Yes
120	Saratti, Flaminia flaminia.saratti@unibo.it	IT		Yes
121	Sarrazin, Julien julien.sarrazin@sorbonne-universite.fr	FR		Yes
122	Skachek, Vitaly vitaly.skachek@gmail.com	EE		Yes

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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
123	Skrivervik, Anja anja.skrivervik@epfl.ch	CH		Yes
124	Stojkoska, Biljana biljanastojkoska@yahoo.com	MK		Yes
125	Sykora, Jan jan.sykora@fel.cvut.cz	CZ		Yes
126	Vassiliou, Vasos vasosv@ucy.ac.cy	CY		Yes
127	VELEZ, Fernando José fjv@ubi.pt	PT		Yes
128	Verdone, Roberto roberto.verdone@unibo.it	IT		Yes
129	Wagen, Jean Frederic jfowagen@gmail.com	CH		Yes
130	Zammit, Joseph A. joseph.a.zammit@mcast.edu.mt	MT		Yes
131	Zanaj, Elma ezanaj@fti.edu.al	AL		Yes
132	Zemen, Thomas thomas.zemen@ait.ac.at	AT		Yes
133	Zentner, Radovan radovan.zentner@fer.hr	HR		Yes
134	Zhang, Haibin haibin.zhang@tno.nl	NL		Yes

Country Codes: Albania (AL), Austria (AT), Belgium (BE), Bosnia and Herzegovina (BA), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Iceland (IS), Ireland (IE), Israel (IL), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Montenegro (ME), The Netherlands (NL), the North Republic of Macedonia (MK), Norway (NO), Poland (PL), Portugal (PT), The Republic of Moldova (MD), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR), United Kingdom (UK).

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Meeting Secretary

(Chair or local organiser)

Name + signature

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MEETING ATTENDANCE LIST OF (6TH MC AND TECHNICAL MEETING - 13/09/2023)

The attendance list provides the names of the participants who confirmed attendance via their personal e-COST invitation link.

Meeting Title: 6th MC and Technical Meeting

Meeting Reference: E-COST-MEETING-CA20120-110923-5b827e8a

Action Number: CA20120

Meeting Administrator: Flaminia Saratti








E-mail: flaminia.saratti@unibo.it

- Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)
- Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)

Nr	Participant	Country	Signature	Is Attending
1	ahmadi, hamed hamed.ahmadi@ucd.ie	UK		Yes
2	Bagheri, Nila nila.bagheri@ubi.pt	PT		
3	Blazek, Thomas thomas.blazek@silicon-austria.com	AT		
4	Boban, Mate mate.boban@huawei.com	DE		
5	Cai, Xuesong xuesong.cai@eit.lth.se	SE		
6	Castelló Palacios, Sergio sercaspa@iteam.upv.es	ES		
7	Cichoń, Krzysztof krzysztof.cichon@put.poznan.pl	PL		Yes
8	Conrat, Jean-Marc jeanmarc.conrat@orange.com	FR		Yes
9	Csatho, Botond Tamas csatho.botond@edu.bme.hu	HU		YES
10	d'Orey, Pedro pdorey@fe.up.pt	PT		








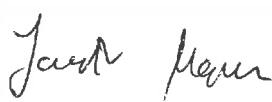

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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
11	De Guzman, Mar Francis francis.deguzman@aalto.fi	FI		
12	Degli-Esposti, Vittorio v.degliestposti@unibo.it	IT		Yes
13	Di Cicco, Nicola nicola.dicicco@polimi.it	IT		
14	Di Renzo, Marco marco.di-renzo@universite-paris-saclay.fr	FR		
15	Dryjanski, Marcin marcin.dryjanski@rimedolabs.com	n/a		Yes
16	Dupleich, Diego diego-andres.dupleich@tu-ilmenau.de	DE		Yes
17	Fan, Wei wfa@es.aau.dk	DK		
18	Fortes Rodríguez, Sergio sfr@ic.uma.es	ES		
19	Grazioso, Paolo pgrazioso@fub.it	IT		Yes
20	Hannotier, Cédric cedric.hannotier@ulb.be	BE		
21	Heijs, Remco r.heijs@student.tue.nl	NL		Yes
22	Hoffmann, Marcin marcin.ro.hoffmann@doctorate.put.poznan.pl	PL		
23	Iradier, Eneko eneko.iradier@ehu.eus	ES		
24	Janji, Salim salim_janji@hotmail.com	PL		









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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
25	Johansson, Anders J ajn@eit.lth.se	SE		
26	Joseph, Wout wout.joseph@ugent.be	BE		Yes
27	Kang, CheChia kang.c.aa@m.titech.ac.jp	JP		
28	Keerativoranan, Nopphon nopphon.keerativoranan@ap.ide.titech.ac.jp	JP		
29	Khan, Aamir Ullah aamir-ullah.khan@tu-ilmenau.de	DE		
30	Kim, Minseok mskim@eng.niigata-u.ac.jp	JP		
31	Kliks, Adrian adrian.kliks@put.poznan.pl	PL		Yes
32	Kokkonemi, Joonas joonas.kokkonemi@oulu.fi	FI		
33	Kotterman, Wim wim.kotterman@tu-ilmenau.de	DE		
34	Kyösti, Pekka pekka.kyosti@keysight.com	FI		
35	Lansford, Jim jim.lansford@ieee.org	n/a		
36	Lukac, Jozef lukacjo1@fel.cvut.cz	CZ		
37	Magiera, Jaroslaw jaroslaw.magiera@pg.edu.pl	PL		
38	Mallik, Mohammed mohammed.mallik.etu@univ-lille.fr	FR		







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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
39	Mao, Kai maokai@nuua.edu.cn	CN		
40	Marsalek, Roman marsaler@vut.cz	CZ		Yes
41	Méndez-Monsanto Suárez, Lianet 100384026@alumnos.uc3m.es	ES		
42	Miao, Yang y.miao@utwente.nl	NL		
43	Micó, Sergio sermiro@teleco.upv.es	ES		
44	Mlinar, Tomi tomi.mlinar@fe.uni-lj.si	SI		
45	Muzaffar, Raheeb raheeb.muzaffar@silicon-austria.com	AT		
46	Myint, Saw James saw-james.myint@tu-ilmenau.de	DE		
47	Orozco, Luis luis.orozco@uclm.es	ES		Yes
48	Ortiz, Flor flor.ortiz@uni.lu	LU		Yes
49	Pahlke, Steffen s.pahlke@tu-braunschweig.de	DE		
50	Rudd, Richard richard.rudd@plumconsulting.co.uk	UK		
51	Rumney, Moray moray@rumneytelecom.com	UK		✓
52	Samorzewski, Adam adam.samorzewski@doctorate.put.poznan.pl	PL		YES

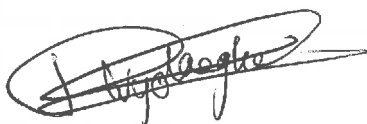


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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
53	Sandra, Michiel michiel.sandra@eit.lth.se	SE		
54	Sayrafian, Kamran kamran.sayrafian@nist.gov	US		Yes
55	Schiffarth, Anna-Malin schiffarth@ihf.rwth-aachen.de	DE		
56	Schneider, Christian christian.schneider@tu-ilmenau.de	DE		
57	Shah, Syed Najaf Haider syed-najaf-haider.shah@tu-ilmenau.de	DE		
58	Skocaj, Marco marco.skocaj@unibo.it	IT		
59	Skoric, Tamara tamara.ceranic@gmail.com	RS		
60	Smeenk, Carsten carsten.smeenk@iis.fraunhofer.de	DE		Yes
61	Sommerkorn, Gerd som@tu-ilmenau.de	DE		
62	Svensson, Tommy tommy.svensson@chalmers.se	n/a		
63	Taramit, Hamid hamid.taramit@alu.uclm.es	ES		Yes
64	Teich, Werner werner.teich@uni-ulm.de	DE		Yes
65	Thomä, Reiner reiner.thomae@tu-ilmenau.de	DE		
66	Timcenko, Valentina valentina.timcenko@pupin.rs	RS		Yes








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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
67	Torres, Renato rbtorres93@gmail.com	ES		
68	Torrice, Saul storrice@gwu.edu	US		
69	Villaescusa Tébar, Álvaro alvilte1@teleco.upv.es	ES		
70	Wydaeghe, Robin robin.wydaeghe@ugent.be	BE		Yes
71	Zhang, Peize peize.zhang@oulu.fi	FI		
72	Zhu, Hong hong.zhu@tugraz.at	AT	Hong zhu	
73	zhu, qiuming zhuqiuming@nuaa.edu.cn	CN		
74	Ziganshin, Ainur ainur.ziganshin@tu-ilmenau.de	DE		
75	Zugno, Tommaso tommaso.zugno@huawei.com	DE		
76	Aleksiejūnas, Rimvydas rimvydas.aleksiejunas@ff.vu.lt	LT		
77	Alexandru, Marian marian.alexandru@unitbv.ro	RO		
78	Ambroziak, Slawomir slawomir.ambroziak@pg.edu.pl	PL		Yes
79	ARSLAN, Hüseyin arslan.usf@gmail.com	TR	H. Arslan	Yes
80	Bajić, Dragana dragana.bajic@gmail.com	RS		Yes







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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
81	Berbakov, Lazar lazar.berbakov@pupin.rs	RS		
82	Bito, Janos bito.janos@vik.bme.hu	HU		Yes
83	Bota, Vasile Vasile.Bota@com.utcluj.ro	RO		Yes
84	Brennan, Conor conor.brennan@dcu.ie	IE		
85	Buratti, Chiara c.buratti@unibo.it	IT		
86	Burr, Alister alister.burr@york.ac.uk	UK		Yes
87	Chatzimisios, Periklis pchatzimisios@ihu.gr	EL		Yes
88	Chatzinotas, Symeon schatzin@ieee.org	LU		
89	Clavier, Laurent laurent.clavier@imt-nord-europe.fr	FR		Yes
90	Correia, Luis M luis.m.correia@tecnico.ulisboa.pt	PT		Yes
91	Czapiewska, Agnieszka agnieszka.czapiewska@pg.edu.pl	PL		Yes
92	Czylwik, Andreas czylwik@nts.uni-duisburg-essen.de	DE		Yes
93	Deruyck, Margot margot.deruyck@ugent.be	BE		Yes
94	Dittmann, Lars ld@com.dtu.dk	DK		


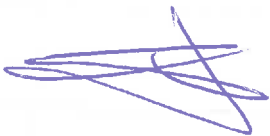



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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
95	Ekman, Torbjörn torbjorn.ekman@ntnu.no	NO		Yes
96	Gaillot, Davy davy.gaillot@univ-lille.fr	FR		Yes
97	Garcia-Pardo, Concepcion cgpardo@iteam.upv.es	ES		Yes
98	Gardasevic, Gordana gordana.gardasevic@etf.unibl.org	BA		
99	Haddad, Yoram haddad@g.jct.ac.il	IL		
100	Horvath, Balint horvath.balint@vik.bme.hu	HU		
101	Hristov, Atanas atanas.hristov@uist.edu.mk	MK		Yes
102	Ivashina, Marianna marianna.ivashina@chalmers.se	SE		
103	Javornik, Tomaž tomaz.javornik@ijs.si	SI		Yes
104	Katzis, Konstantinos K.Katzis@euc.ac.cy	CY		Yes
105	Kocan, Enis enisk@ucg.ac.me	ME		
106	Kulakowski, Paweł kulakowski@agh.edu.pl	PL		Yes
107	Kürner, Thomas kuerner@ifn.ing.tu-bs.de	DE		
108	Lager, Ioan Ernest i.e.lager@tudelft.nl	NL		Yes

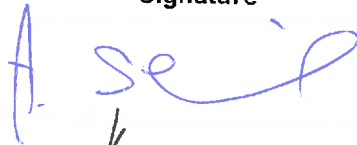







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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
109	Lagunas, Eva eva.lagunas@uni.lu	LU		
110	Lehne, Per Hjalmar per-hjalmar.lehne@telenor.com	NO		
111	Lipovac, Adriana adriana.lipovac@unidu.hr	HR		Yes
112	Machaj, Juraj juraj.machaj@feit.uniza.sk	SK		
113	Mikhaylov, Konstantin konstantin.mikhaylov@oulu.fi	FI		Yes
114	Molina-Garcia-Pardo, Jose-Maria josemaria.molina@upct.es	ES		Yes
115	Ozdemir, Mehmet Kemal mkozdemir@medipol.edu.tr	TR		
116	Papaj, Ján jan.papaj@tuke.sk	SK		
117	Pedersen, Troels troels@es.aau.dk	DK		
118	Pejanovic-Djurisic, Milica milica@ucg.ac.me	ME		Yes
119	Salous, Sana sana.salous@durham.ac.uk	UK		Yes
120	Saratti, Flaminia flaminia.saratti@unibo.it	IT		Yes
121	Sarrazin, Julien julien.sarrazin@sorbonne-universite.fr	FR		Yes
122	Skachek, Vitaly vitaly.skachek@gmail.com	EE		Yes

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- **Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**
- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
123	Skrivervik, Anja anja.skrivervik@epfl.ch	CH		Yes
124	Stojkoska, Biljana biljanastojkoska@yahoo.com	MK		Yes
125	Sykora, Jan jan.sykora@fei.cvut.cz	CZ		Yes
126	Vassiliou, Vasos vasosv@ucy.ac.cy	CY		
127	VELEZ, Fernando José fjv@ubi.pt	PT		Yes
128	Verdone, Roberto roberto.verdone@unibo.it	IT		
129	Wagen, Jean Frederic jfowagen@gmail.com	CH		Yes
130	Zammit, Joseph A. joseph.a.zammit@mcast.edu.mt	MT		
131	Zanaj, Elma ezanaj@fti.edu.al	AL		
132	Zemen, Thomas thomas.zemen@ait.ac.at	AT		Yes
133	Zentner, Radovan radovan.zentner@fer.hr	HR		
134	Zhang, Haibin haibin.zhang@tno.nl	NL		Yes

Country Codes: Albania (AL), Austria (AT), Belgium (BE), Bosnia and Herzegovina (BA), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Iceland (IS), Ireland (IE), Israel (IL), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Montenegro (ME), The Netherlands (NL), the North Republic of Macedonia (MK), Norway (NO), Poland (PL), Portugal (PT), The Republic of Moldova (MD), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR), United Kingdom (UK).

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Meeting Secretary

(Chair or local organiser)

Name + signature

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MEETING ATTENDANCE LIST OF (6TH MC AND TECHNICAL MEETING - 14/09/2023)

The attendance list provides the names of the participants who confirmed attendance via their personal e-COST invitation link.

Meeting Title: 6th MC and Technical Meeting

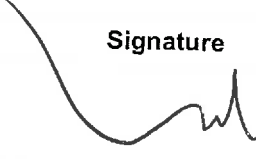





Meeting Reference: E-COST-MEETING-CA20120-110923-5b827e8a

Action Number: CA20120

Meeting Administrator: Flaminia Saratti





E-mail: flaminia.saratti@unibo.it

- Management Committee - Management Committee Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)
- Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)

Nr	Participant	Country	Signature	Is Attending
1	ahmadi, hamed hamed.ahmadi@ucd.ie	UK		Yes
2	Bagheri, Nila nila.bagheri@ubi.pt	PT		
3	Blazek, Thomas thomas.blazek@silicon-austria.com	AT		
4	Boban, Mate mate.boban@huawei.com	DE		Y
5	Cai, Xuesong xuesong.cai@eit.lth.se	SE		
6	Castelló Palacios, Sergio sercaspa@iteam.upv.es	ES		
7	Cichoń, Krzysztof krzysztof.cichon@put.poznan.pl	PL		Yes
8	Conrat, Jean-Marc jeanmarc.conrat@orange.com	FR		Yes
9	Csatho, Botond Tamas csatho.botond@edu.bme.hu	HU		YES
10	d'Orey, Pedro pdorey@fe.up.pt	PT		








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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
11	De Guzman, Mar Francis francis.deguzman@aalto.fi	FI		
12	Degli-Esposti, Vittorio v.degliestposti@unibo.it	IT		Yes
13	Di Cicco, Nicola nicola.dicicco@polimi.it	IT		
14	Di Renzo, Marco marco.di-renzo@universite-paris-saclay.fr	FR		
15	Dryjanski, Marcin marcin.dryjanski@rimedolabs.com	n/a		Yes
16	Dupleich, Diego diego-andres.dupleich@tu-ilmenau.de	DE		Yes
17	Fan, Wei wfa@es.aau.dk	DK		
18	Fortes Rodríguez, Sergio sfr@ic.uma.es	ES		
19	Grazioso, Paolo pgrazioso@fub.it	IT		Yes
20	Hannotier, Cédric cedric.hannotier@ulb.be	BE		
21	Heijs, Remco r.heijs@student.tue.nl	NL		Yes
22	Hoffmann, Marcin marcin.ro.hoffmann@doctorate.put.poznan.pl	PL		
23	Iradier, Eneko eneko.iradier@ehu.eus	ES		
24	Janji, Salim salim_janji@hotmail.com	PL		






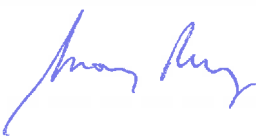
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Nr	Participant	Country	Signature	Is Attending
25	Johansson, Anders J aj@eit.lth.se	SE		
26	Joseph, Wout wout.joseph@ugent.be	BE		Yes
27	Kang, CheChia kang.c.aa@m.titech.ac.jp	JP	CHECHIA KANG.	
28	Keerativoranan, Nopphon nopphon.keerativoranan@ap.ide.titech.ac.jp	JP		
29	Khan, Aamir Ullah aamir-ullah.khan@tu-ilmenau.de	DE		
30	Kim, Minseok mskim@eng.niigata-u.ac.jp	JP		
31	Kliks, Adrian adrian.kliks@put.poznan.pl	PL		Yes
32	Kokkonen, Joonas joonas.kokkonen@oulu.fi	FI		
33	Kotterman, Wim wim.kotterman@tu-ilmenau.de	DE		
34	Kyösti, Pekka pekka.kyosti@keysight.com	FI		
35	Lansford, Jim jim.lansford@ieee.org	n/a		
36	Lukac, Jozef lukacjo1@fel.cvut.cz	CZ		
37	Magiera, Jarosław jaroslaw.magiera@pg.edu.pl	PL		
38	Mallik, Mohammed mohammed.mallik.etu@univ-lille.fr	FR		



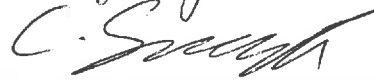



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Nr	Participant	Country	Signature	Is Attending
39	Mao, Kai maokai@nuaa.edu.cn	CN		
40	Marsalek, Roman marsaler@vut.cz	CZ		Yes
41	Méndez-Monsanto Suárez, Lianet 100384026@alumnos.uc3m.es	ES		
42	Miao, Yang y.miao@utwente.nl	NL		
43	Micó, Sergio sermiro@teleco.upv.es	ES		
44	Mlinar, Tomi tomi.mlinar@fe.uni-lj.si	SI		
45	Muzaffar, Raheeb raheeb.muzaffar@silicon-austria.com	AT		
46	Myint, Saw James saw-james.myint@tu-ilmenau.de	DE		
47	Orozco, Luis luis.oroSCO@uclm.es	ES		Yes
48	Ortiz, Flor flor.ortiz@uni.lu	LU		
49	Pahlke, Steffen s.pahlke@tu-braunschweig.de	DE		
50	Rudd, Richard richard.rudd@plumconsulting.co.uk	UK		
51	Rumney, Moray moray@rumneytelecom.com	UK		✓
52	Samorzewski, Adam adam.samorzewski@doctorate.put.poznan.pl	PL		

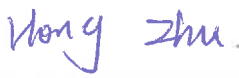



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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
53	Sandra, Michiel michiel.sandra@eit.lth.se	SE		
54	Sayrafian, Kamran kamran.sayrafian@nist.gov	US		Yes
55	Schiffarth, Anna-Malin schiffarth@ihf.rwth-aachen.de	DE		
56	Schneider, Christian christian.schneider@tu-ilmenau.de	DE		
57	Shah, Syed Najaf Haider syed-najaf-haider.shah@tu-ilmenau.de	DE		
58	Skocaj, Marco marco.skocaj@unibo.it	IT		
59	Skoric, Tamara tamara.ceranic@gmail.com	RS		
60	Smeenk, Carsten carsten.smeenk@iis.fraunhofer.de	DE		Yes
61	Sommerkorn, Gerd som@tu-ilmenau.de	DE		
62	Svensson, Tommy tommy.svensson@chalmers.se	n/a		Yes
63	Taramit, Hamid hamid.taramit@alu.uclm.es	ES		Yes
64	Teich, Werner werner.teich@uni-ulm.de	DE		Yes
65	Thomä, Reiner reiner.thomae@tu-ilmenau.de	DE		
66	Timcenko, Valentina valentina.timcenko@pupin.rs	RS		Yes









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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
67	Torres, Renato rbotorres93@gmail.com	ES		
68	Torrice, Saul storrice@gwu.edu	US		
69	Villaescusa Tébar, Álvaro alvilte1@teleco.upv.es	ES		
70	Wydaeghe, Robin robin.wydaeghe@ugent.be	BE		Yes
71	Zhang, Peize peize.zhang@oulu.fi	FI		
72	Zhu, Hong hong.zhu@tugraz.at	AT		
73	zhu, qiuming zhuqiuming@nuaa.edu.cn	CN		
74	Ziganshin, Ainur ainur.ziganshin@tu-ilmenau.de	DE		
75	Zugno, Tommaso tommaso.zugno@huawei.com	DE		
76	Aleksiejūnas, Rimvydas rimvydas.aleksiejunas@ff.vu.lt	LT		
77	Alexandru, Marian marian.alexandru@unitbv.ro	RO		
78	Ambroziak, Slawomir slawomir.ambroziak@pg.edu.pl	PL		Yes
79	ARSLAN, Hüseyin arслан.usf@gmail.com	TR		Yes
80	Bajić, Dragana dragana.bajic@gmail.com	RS		Yes







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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
81	Berbakov, Lazar lazar.berbakov@pupin.rs	RS		
82	Bito, Janos bito.janos@vik.bme.hu	HU		Yes
83	Bota, Vasile Vasile.Bota@com.utcluj.ro	RO		Yes
84	Brennan, Conor conor.brennan@dcu.ie	IE		
85	Buratti, Chiara c.buratti@unibo.it	IT		
86	Burr, Alister alister.burr@york.ac.uk	UK		Yes
87	Chatzimisios, Periklis pchatzimisios@ihu.gr	EL		Yes
88	Chatzinotas, Symeon schatzin@ieee.org	LU		
89	Clavier, Laurent laurent.clavier@imt-nord-europe.fr	FR		Yes
90	Correia, Luis M luis.m.correia@tecnico.ulisboa.pt	PT		Yes
91	Czapiewska, Agnieszka agnieszka.czapiewska@pg.edu.pl	PL		Yes
92	Czylwik, Andreas czylwik@nts.uni-duisburg-essen.de	DE		Yes
93	Deruyck, Margot margot.deruyck@ugent.be	BE		Yes
94	Dittmann, Lars ld@com.dtu.dk	DK		





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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
95	Ekman, Torbjörn torbjorn.ekman@ntnu.no	NO		Yes
96	Gaillot, Davy davy.gaillot@univ-lille.fr	FR		Yes
97	Garcia-Pardo, Concepcion cgpardo@iteam.upv.es	ES		Yes
98	Gardasevic, Gordana gordana.gardasevic@etf.unibl.org	BA		
99	Haddad, Yoram haddad@g.jct.ac.il	IL		
100	Horvath, Balint horvath.balint@vik.bme.hu	HU		
101	Hristov, Atanas atanas.hristov@uist.edu.mk	MK		Yes
102	Ivashina, Marianna marianna.ivashina@chalmers.se	SE		
103	Javornik, Tomaž tomaz.javornik@ijs.si	SI		Yes
104	Katzis, Konstantinos K.Katzis@euc.ac.cy	CY		Yes
105	Kocan, Enis enisk@ucg.ac.me	ME		
106	Kulakowski, Pawel kulakowski@agh.edu.pl	PL		Yes
107	Kürner, Thomas kuerner@ifn.ing.tu-bs.de	DE		
108	Lager, Ioan Ernest i.e.lager@tudelft.nl	NL		Yes




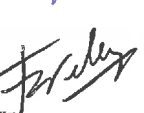




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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
109	Lagunas, Eva eva.lagunas@uni.lu	LU		
110	Lehne, Per Hjalmar per-hjalmar.lehne@telenor.com	NO		
111	Lipovac, Adriana adriana.lipovac@unidu.hr	HR		Yes
112	Machaj, Juraj juraj.machaj@feit.uniza.sk	SK		
113	Mikhaylov, Konstantin konstantin.mikhaylov@oulu.fi	FI		Yes
114	Molina-Garcia-Pardo, Jose-Maria josemaria.molina@upct.es	ES		Yes
115	Ozdemir, Mehmet Kemal mkozdemir@medipol.edu.tr	TR		
116	Papaj, Ján jan.papaj@tuke.sk	SK		
117	Pedersen, Troels troels@es.aau.dk	DK		
118	Pejanovic-Djurisic, Milica milica@ucg.ac.me	ME		Yes
119	Salous, Sana sana.salous@durham.ac.uk	UK		Yes
120	Saratti, Flaminia flaminia.saratti@unibo.it	IT		Yes
121	Sarrazin, Julien julien.sarrazin@sorbonne-universite.fr	FR		Yes
122	Skachek, Vitaly vitaly.skachek@gmail.com	EE		Yes

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- **Working Group - Working Group Meeting (Start Date: 12/09/2023 End Date: 14/09/2023)**

Nr	Participant	Country	Signature	Is Attending
123	Skrivervik, Anja anja.skrivervik@epfl.ch	CH		Yes
124	Stojkoska, Biljana biljanastojkoska@yahoo.com	MK		Yes
125	Sykora, Jan jan.sykora@fel.cvut.cz	CZ		Yes
126	Vassiliou, Vasos vasosv@ucy.ac.cy	CY		Yes
127	VELEZ, Fernando José fjv@ubi.pt	PT		Yes
128	Verdone, Roberto roberto.verdone@unibo.it	IT		
129	Wagen, Jean Frederic jfowagen@gmail.com	CH		Yes
130	Zammit, Joseph A. joseph.a.zammit@mcast.edu.mt	MT		
131	Zanaj, Elma ezanaj@fti.edu.al	AL		
132	Zemen, Thomas thomas.zemen@ait.ac.at	AT		Yes
133	Zentner, Radovan radovan.zentner@fer.hr	HR		
134	Zhang, Haibin haibin.zhang@tno.nl	NL		Yes

Country Codes: Albania (AL), Austria (AT), Belgium (BE), Bosnia and Herzegovina (BA), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Iceland (IS), Ireland (IE), Israel (IL), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Montenegro (ME), The Netherlands (NL), the North Republic of Macedonia (MK), Norway (NO), Poland (PL), Portugal (PT), The Republic of Moldova (MD), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR), United Kingdom (UK).

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Meeting Secretary

(Chair or local organiser)

Name + signature

WG Co-Chair Contributions

WG1

Whitepaper related

- Whitepaper is finalized
- To be uploaded to COST website in the next days
- Also to be uploaded to arxiv
- Plan for “spin-off” papers based on the white paper (NB: white paper content is starting point: depending on topic, some or a lot of further work will be required)
 - o Leaders to coordinate with interested authors of relevant sections
 - o Yang and Carsten to lead an ISAC paper submission, to be further supplanted with subWG ISAC activities not related to channels;
 - o Diego, Wei , Xuesong to lead a paper on Sounder design, metrology and parameter estimation; Julien to contribute on advanced antenna concepts for sounding
 - o Ruisi He to lead a paper on AI for channel modeling
 - o Enrico to lead a paper on new techniques and applications of deterministic channel modeling
 - o Joonas to lead a paper on new technologies
 - o Other initiatives are welcome
- If there is interest AND the spin-off papers deviate significantly from original content in white paper, some authors expressed interest in submitting entire paper to a journal accepting surveys

Special issue in Radio Science (suggestion by Sana, editor in chief)

- Xuesong volunteered to be a Guest Editor
- 2-3 guest editors and proponent
 - o Call for another (more senior) editor: please reach out to Xuesong, Sana
 - o Diversity wrt editors is preferred
 - o Task: invite experts from COST and broader to contribute
- Target: 6-10 papers in the Special issue
- Spin-off papers (above) invited, with a note that call for papers will be open publicly

Laurent requested input for COST report

- In case of joint papers and projects coming out of INTERACT

- In particular if participants are from 2+ countries
- Send info to Laurent

Body area network propagation (Luis)

- Not addressed in WG1 white paper
- Initiative to write a paper covering the topic
- Relevant (propagation related) aspects to be included in the final report from WG1

URSI session (Slawomir request, post WG1 discussion)

- Diego to lead URSI session on mmW/THz propagation
- 3-6 papers sought
- Additional proponent sought
- Reach out to Diego, Slawomir for details (also, see Slawomir's email on the topic)

WG2

WG2 had 10 papers presented, 3 in joint session with WG1, 7 to WG2 alone. Of these, two were on localisation, two on aspects of MIMO, two on aspects of OFDM, one on jamming, one on open RAN disaggregation, and three on effects of non-linearity. One provided curves for BLER of 5G NR – which should be useful in system-level simulation. (This may add up to more than 10, because some can be categorised in more than one way).

The discussion was entirely on the WG2 White Paper, jointly with SWG2.1 (ISAC). There will be three main sections: Physical Layer; Localisation and ISAC. Carsten Smeenk presented proposed section headings on ISAC; Alister Burr some proposals for Physical Layer sections, and others were added. The next steps are to consolidate a list of proposed sections, and to circulate it via the WG2 reflector for comments and suggestions, and also to ask for volunteers to write or edit sections. The objective is to come to the Lisbon meeting with a firm proposal for the outline/contents list of the White Paper.

WG2 – ISAC

Joint session on ISAC and channels:

2 TDs on 300GHz and THz channel measurements.

ISAC discussion slot:

The main discussion topics were: What is the purpose of ISAC? Giving a solution before having a problem?

New communication technologies enable new possibilities.

Plenary presentation:

Presentation on ISAC definition and terminologies -> Afterwards we had deep discussions on different and our(Interact) perspectives on ISAC.

WG2 discussion round:

Discussion about possible ISAC sub-sections and topics for the WG2 whitepaper.

VT1

During the INTERACT 6th MC and 6th Technical Meeting the VT1: Health and Well-Being held one session with 3 TDs. There were 15 on-site attendees. A summary of the presentations and discussion is provided in the following.

I. September 12th (14:00-15:30)

During the session three TDs (no. 12, 3, and 15) were presented. In the first TD (no. 12), a stress level detection methodology based on capacitive electrocardiogram (cECG) signals of a driving subject has been presented. The authors have investigated the ability to classify different levels of stress during driving based on specific features that can be extracted from the recorded cECG using Machine Learning (ML). In the second TD (no. 3), the electrical characterization of several biological solutions that are generally used in sensing systems at cellular and molecular level were presented. The results were obtained based on measurements from 0.2 GHz to 20 GHz and at various temperatures. The authors of the last TD (no. 15) studied the performance of several MAC protocols for in-body THz nano-networks. Computer simulations were conducted to analyse the protocols and provide information on their applicability for a specific in-body application.

After TD presentations the VT1 discussion was held in the joint session with the EMF subgroup. The summary of the discussed topics is provided in the following.

1. Challenges

The challenges have been defined in TD(22)03070 “Technical Challenges in Vertical Team 1: Health & Well-Being” (meeting in Valencia). Five technical challenges have been identified as the baseline for VT1:

- Advanced Communications for Medical Implants, Wearables and Ingestible Implants
- Advanced Telemedicine including Remote Health and activity monitoring for diagnosis or rehabilitation
- Next Generation Technologies for Public Health and Emergencies
- Enhanced Privacy and Security in Health Data and patient safety
- Nano-Networks.

The above list captures the general technical challenges that are under discussion and research by VT1. The TDs that have already been presented by the participants in the past meetings of COST CA20120 are addressing some of the issues under these challenges. The technical topics in VT1 cover a wide spectrum of subjects; therefore, the challenges presented in this document is not meant to be an exhaustive list.

Consequently, in the future, the content of this list is expected to evolve as more VT1 participants contribute their research ideas and results to the action and possibly new challenge areas are identified.

2. Training schools

a) *Executed*

- None

b) *Planned*

- None

VT1 members were asked to send information on planned or executed training schools to the VT1 Chairs.

3. Short Term Scientific Missions among participant institutions

a) *Executed*

- 26-30.09.2022, **UPV@PG**: “Measurements of the materials’ properties (reflection and transmission losses) in classroom and meeting room environments at 26-65 GHz.”

b) *Planned*

- 2024, **IPS@PG**: Radio channel measurements (including XPD) in public transport vehicles (buses, trams) at mmWaves

VT1 members were asked to send information on planned or executed STSMs to the VT1 Chairs.

4. Joint workshops and special sessions

a) *Executed*

- *IoT-Health 2023: 5th International Workshop on IoT Enabling Technologies in Healthcare* at IEEE International Conference on Communications, 28 May - 01 June 2023, Rome, Italy; Organizers: Kamran Sayrafian (NIST), Hamed Ahmadi (UOY), Konstantinos Katzis (EUC), Slawomir Ambroziak (PG)
- *COST CA20120 INTERACT: Measurement & Modelling of Radio Waves Propagation for Indoor Communications, XXXVth General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS 2023)*, August 19 – 26, 2023, Sapporo, Japan; Organizers: Slawomir Ambroziak (PG), Kamran Sayrafian (NIST).

b) *Planned*

- *COST CA20120 INTERACT: Measurement & Modelling of Radio Waves Propagation for Indoor Communications, 4th URSI Atlantic / Asia-Pacific Radio Science Meeting (AT-RASC 2024)*, 19-24 May 2024, Gran Canaria, Spain; Organizers: Slawomir Ambroziak (PG), Kamran Sayrafian (NIST);
- *COST CA20120 INTERACT: Body Area Networks – Propagation Channel Modelling and EMF Exposure, 4th URSI Atlantic / Asia-Pacific Radio Science Meeting (AT-RASC 2024)*, 19-24 May 2024, Gran Canaria, Spain; Organizers: Margot Deruyck (UGENT), Slawomir Ambroziak (PG);
- *IoT-Health 2024: 6th International Workshop on IoT Enabling Technologies in Healthcare at IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC 2024)*; Organizers: Kamran Sayrafian (NIST), Hamed Ahmadi (UOY), Konstantinos Katzis (EUC), Slawomir Ambroziak (PG).

VT1 members were asked to send information on planned or executed joint workshops and special sessions to the VT1 Chairs.

5. Collaboration and projects resulting from the action

a) *Ongoing*

- **IST, PG, IPS, RWTH and OULU:** “Off-Body and Body-to-Body Radio Channel Modelling at UWB and mmWaves Bands”;
- **PG and UPV:** “Measurements of the Channel Impulse Response at mmWaves for Conference Networks”.
- **EUC and NIST:** “Remote Monitoring of Physiological Signals using LoRa”.
- **EUC and UNS:** two students from UNS visited EUC from August to September 2023; Title of the internship: “Wearable Medical Devices Operation Requirements and IoT Communication protocol options”

c) *Planned*

- **PG and IST:** “Investigating the influence of the radio channel on synchronization and precision of position estimation of the user using the 5G / LTE / NB-IoT radio interfaces”;

VT1 members were asked to send information on planned or ongoing collaboration to the VT1 Chairs.

6. Joint papers (preferably with acknowledgements to INTERACT)

a) *Published*

- Ferreira M.M., Cardoso F.D., Ambroziak S.J., Correia L.M., *Bandwidth Dependence of the Propagation Channel in Circular Metallic BAN Environments*, IEEE Access, vol. 11, pp. 20159-20168, 2023, DOI: 10.1109/ACCESS.2023.3249466.
- Ferreira M.M., Cardoso F.D., Ambroziak S.J., Turbic K., Correia L.M., *Mobility's Influence on System Loss in Off-Body BAN Scenarios*, Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit), 7-10 June, Grenoble, France, 2022;
- Ambroziak S.J., Cwalina K.K., Rajchowski P., Cardoso F.D., Ferreira M.M., Correia L.M., *A Cross-Polarisation Discrimination Analysis of Off-Body Channels in Passenger Ferryboat Environments*, IEEE Access, Vol. 10, pp. 55627-55637, DOI:10.1109/ACCESS.2022.3175009, 2022;
- Ferreira M. M., Cardoso F. D., Ambroziak S.J., Correia L.M., *Influence of User Mobility and Antenna Placement on System Loss in B2B Networks*, IEEE Access. Vol. 10, pp. 37039-37049, DOI: 10.1109/ACCESS.2022.3163859, 2022.
- Ambroziak S.J., Cardoso F.D., Kosz P., Ferreira M.M., Correia L.M., *Analiza zaników szybkozmiennych w radiowych sieciach BAN pracujących w rewerberacyjnym środowisku propagacyjnym*, Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne, No. 4/2022, pp. 505-510, DOI 10.15199/59.2022.4.91, 2022 (in Polish).
- Drozdowska M., Ambroziak S.J., Cwalina K.K., Rajchowski P., Cardona N., *Channel Impulse Response Measurements at mmWave Bands in Offices and Conference Rooms*, XXXVth General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS 2023), August 19 – 26, 2023, Sapporo, Japan.

- Ferreira M.M., Cardoso F.D., Ambroziak S.J., Särestöniemi M., Turbic K., Correia L.M., *Depolarisation Model for a BAN Indoor Scenario*, European Conference on Networks and Communications (EuCNC & 6G Summit), Göteborg (Sweden), 6-9 June, 2023.
- S.J. Ambroziak, K.K. Cwalina, M.M. Ferreira, F.D. Cardoso, L.M. Correia, *System Loss Model for Body-to-Body Networks in Indoor and Outdoor Environments*, IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC), Toronto, Canada, 5–8 September, 2023.
- M.M. Ferreira, F.D. Cardoso, S.J. Ambroziak, M. Särestöniemi, K. Turbic, L.M. Correia, *System Loss Model for Body Area Networks in Room Scenarios*, IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC), Toronto, Canada, 5–8 September, 2023.

b) *Planned*

- Ferreira M.M., Cardoso F.D., Ambroziak S.J., Särestöniemi M., Turbic K., Correia L.M., *Influence of User Mobility on System Loss and Depolarisation in a BAN Indoor Scenario* – submitted to IEEE TAP

VT1 members were asked to send information on accepted and/or published joint papers to the VT1 Chairs.

7. Liaisons

- IEEE P2933: *Standard for Clinical Internet of Things (IoT) Data and Device Interoperability with TIPPSS - Trust, Identity, Privacy, Protection, Safety, Security* (Konstantinos Katzis, Irene Kilanioti)
- IEEE 802.15 TG6ma: *Dependable Body Area Networks* (Kamran Sayrafian)
- URSI Commission C: *Radiocommunication Systems and Signal Processing* (Krzysztof Cwalina)
- URSI Commission F: *Wave Propagation and Remote Sensing* (Sławomir Ambroziak)
- EurAAP: *Working Group on Propagation* (Krzysztof Cwalina)

8. White papers

a) *Published*

- *None.*

b) *Planned*

- *None.*

VT1 members were asked to send information on planned and/or published white papers to the VT1 Chairs.

9. Datasets (HA1):

- “System Loss in Body-to-Body BAN in Indoor and Outdoor at 2.45 GHz” – **PG & IST**
- “System Loss in Off-Body BAN in Indoor at 2.45 GHz” – **PG & IST**
- “Two-layer Phantom-Based UWB Channel Measurements for IB2OB Scenarios” – **UPV**

10. Dissemination

During IRACON a LinkedIn group (*IoT - Health Working Group*) has been created. This group is still active and has 72 members. It can be used as a venue to disseminate VT1 activities.

11. Discussion for VTs – requested by the INTERACT Chair

What is (are) the specific challenge(s) related to VT1?

The VT1 members are currently active in the following technical areas. (These areas have been determined based on the TDs that have been presented since the beginning of INTERACT.)

- Advanced Communications for Medical Implants, Wearables and Ingestible Implants
- Advanced Telemedicine including Remote Health and activity monitoring for diagnosis or rehabilitation
- Next Generation Technologies for Public Health and Emergencies
- Enhanced Privacy and Security in Health Data and patient safety
- Nano-Networks

How do we make progress? What do we need to solve the issues?

- The spectrum of technical topics under the Health Vertical is pretty wide, and there are many challenges that could be addressed in general. The materials presented under TDs are based on the individual researcher's expertise and/or specific project funded by researcher's institution or other European agencies. Although, it is quite possible (and encouraged) that several members collaborate on a focused research topic as a result of the technical exchange during a meeting, it could be challenging to define and initiate new/common projects that deviates from the VT1 member's research plan. This means that the challenges addressed by VT1 would likely be the extension of the current research/projects by the members.
- During the session at the Poznań meeting, the VT1 members discussed a few options to define specific challenges that can be articulated outside the group. These options are:
 - Identifying use-cases, scenarios or specific technical areas that several members can jointly contribute or collaborate throughout the remaining sessions of the INTERACT.
 - Identify opportunities related to standardization activities and contribute technical materials.
 - Integrate all the channel measurements and modelling efforts at VT1 into a white paper.
- Consider the flow of medical information from/to a patient to/from a healthcare service provider as a general theme; then, identify where each member's research activity fits within that theme.

Do we have any ideas to improve the action, its implementation, or about its future?

This question requires further discussions in future meetings.

12. Number of TDs submitted so far: 25

- Feb. 2022, Bologna, Italy: 5 TDs
- Jun. 2022, Lyon, France: 4 TDs
- Sept. 2022, Valencia, Spain: 6 TDs
- Jan. 2023, Dubrovnik, Croatia: 3 TDs
- May 2023, Barcelona, Spain: 4 TDs
- September 2023, Poznań, Poland, 3 TDs

SWG EMF

The group had one session in which 2 TDs related to exposure were presented. There were 20 attendees on site in Poznan (which is good considering parallel sessions), that really actively participated of the meeting.

Regarding EMF TDs, the first TD was related on the reconstruction of mapping of urban electromagnetic field exposure using limited sensors, and the second was on 6G distributed and collocated massive MIMO exposure simulations in realistic environments. After the presentations, there was an open discussion about the scope of the group, joint activities and future plans. A LinkedIn page has been also created to visualize the activity of the group. An EMF convened session at EuCAP 2024 has been accepted and a workshop at PIMRC 2024 will be organized (special sessions call in January/February 2023, thus more news at the Lisbon meeting).

Liaisons Feedback

Here is the list of the active liaisons with INTERACT:

- H2020 Reindeer – Fredrik Tufvesson
- EU-ITN MINTS – Fredrik Tufvesson
- 5G DU-Volution – Alister Burr
- 6G-IA (SNS) – Carles Anton-Haro
- TeamUp5G (MSCA ETN/ITN) – Fernando J. Velez and Ana Garcia Armada
- ETSI ISG for Terahertz Communications (THZ) – Mate Boban, Thomas Kürner
- DETERMINISTIC6G (SNS) – Raheeb Muzaffar
- PEPR 5G (France Plan de relance) – Laurent Clavier

6th Scientific & Technical Meeting

Poznan, Poland, 12-14 September 2023



Funded by
the European Union

Chiara BURATTI
University of Bologna



Laurent CLAVIER
IMT Nord Europe



COST INTERACT

Intelligence-Enabling Radio Communications for Seamless Inclusive Interactions

6th MC and Technical Meeting

Poznan, Poland

12-14 September 2023

WELCOME !





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2. Adoption of the Agenda
3. Status of the Action and of the current meeting
4. Report from the Grant Holder
5. Training
6. STSM & more
7. Dissemination
8. Lisbon meeting
9. Data sets
10. Next meetings
11. This meeting

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12. Plenary talks
 - 11:00 - Marcin Dryjanski
 - 12:00 - Mate Boban, Vittorio Degli-Esposti

Tuesday afternoon and Wednesday

13. Sessions

Thursday (09:00am)

14. Plenary talks
 - 11:00 - Dr. Jim Lansford
 - 11:45 - Tommy Svensson

Thursday (11:30am)

15. Feedbacks from Working Group Chairs
16. Feedbacks from Liaisons
17. Action points



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Welcome words.

Krzysztof Cichon
Adrian Kliks





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Any change to the agenda ?

Approval of the minutes from Barcelona's meeting

ATTENDANCE LISTS (for people on site)

Please sign the attendance list for **the day(s) you are present**

No reimbursement of travel expenses (for those entitled to) if attendance lists are not duly signed



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Number of signatory countries 46

COST full members: 36 (ITC: 21)

COST Cooperating Member: 1

COST Partner: 1

International: 5

Near Neighbour Countries: 5

Number of WG members registered on the website



559

Young Researchers 56%

Gender balance 19.5% / 79.5%

Number of MC Members



- 64
- 34 (+9 substitutes) attending the meeting (36 on site)

People attending the meeting



- 70 on site
- 40 remote

Number of TDs



- 40



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Budget Y2

Work and Budget Plan	Budget
Meetings	166.689,35
Training Schools	25.098,00
Short-Term Scientific Mission Grant (STSM)	16.090,00
Inclusiveness Target Countries Conference Grant (ITCG)	3.850,00
Dissemination Conference Grant (VBG)	5.000,00
Dissemination and Communication Products	2.520,00
Other Expenses Related to Scientific Activities (OERSA)	993,00
Total Science Expenditure	220.240,35
FSAC	33.036,05
Total Grant	253.276,40

Meetings

Work and Budget Plan	Spent	Remaining	
Meetings	99.828,80	66.860,55	<div data-bbox="1899 416 2154 528" style="border: 1px solid black; padding: 5px;"> 47.649,76 € Dubrovnik </div>
Training Schools	15.402,91	9.695,09	
STSM	14.400,00	1.690,00	<div data-bbox="1899 687 2154 799" style="border: 1px solid black; padding: 5px;"> 52.179,04 € Barcelona </div>
ITCG	850,00	3.000,00	
VBG	4.400,00	600,00	
Dissemination	2.710,00	- 190,00	
Other (OERSA)	100,00	893,00	
Total Science Expenditure	137.691,71	82.548,64	

Training Schools

Work and Budget Plan	Spent	Remaining
Meetings	99.828,80	66.860,55
Training Schools	15.402,91	9.695,09
STSM	14.400,00	1.690,00
ITCG	850,00	3.000,00
VBG	4.400,00	600,00
Dissemination	2.710,00	- 190,00
Other (OERSA)	100,00	893,00
Total Science Expenditure	137.691,71	82.548,64

15.402,91 €
DolCom

STSMs

Work and Budget Plan	Spent	Remaining
Meetings	99.828,80	66.860,55
Training Schools	15.402,91	9.695,09
STSM	14.400,00	1.690,00
ITCG	850,00	3.000,00
VBG	4.400,00	600,00
Dissemination	2.710,00	- 190,00
Other (OERSA)	100,00	893,00
Total Science Expenditure	137.691,71	82.548,64

12 x
1.200 €
STSMs

ITCGs

Work and Budget Plan	Spent	Remaining
Meetings	99.828,80	66.860,55
Training Schools	15.402,91	9.695,09
STSM	14.400,00	1.690,00
ITCG	850,00	3.000,00
VBG	4.400,00	600,00
Dissemination	2.710,00	- 190,00
Other (OERSA)	100,00	893,00
Total Science Expenditure	137.691,71	82.548,64

1 x
850 €
ITCG

VBGs

Work and Budget Plan	Spent	Remaining	
Meetings	99.828,80	66.860,55	
Training Schools	15.402,91	9.695,09	
STSM	14.400,00	1.690,00	
ITCG	850,00	3.000,00	
VBG	4.400,00	600,00	1 x 1.300 € VBG
Dissemination	2.710,00	- 190,00	1 x 1.500 € VBG
Other (OERSA)	100,00	893,00	1 x 1.600 € VBG
Total Science Expenditure	137.691,71	82.548,64	

Dissemination

Work and Budget Plan	Spent	Remaining	
Meetings	99.828,80	66.860,55	
Training Schools	15.402,91	9.695,09	
STSM	14.400,00	1.690,00	
ITCG	850,00	3.000,00	
VBG	4.400,00	600,00	
Dissemination	2.710,00	- 190,00	190 € Website Maintenance
Other (OERSA)	100,00	893,00	
Total Science Expenditure	137.691,71	82.548,64	2.520 € Promotional Video

OERSA

Work and Budget Plan	Spent	Remaining
Meetings	99.828,80	66.860,55
Training Schools	15.402,91	9.695,09
STSM	14.400,00	1.690,00
ITCG	850,00	3.000,00
VBG	4.400,00	600,00
Dissemination	2.710,00	- 190,00
Other (OERSA)	100,00	893,00
Total Science Expenditure	137.691,71	82.548,64

100 €
Bank Fees

Expected expenses

Work and Budget Plan	Expected	Remaining
Meetings	57.160,00	9.700,55
Training Schools	17.700,00	- 8.004,91
STSM	1.000,00	690,00
ITCG		3.000,00
VBG		600,00
Dissemination		- 190,00
Other (OERSA)	120,00	773,00
Total Science Expenditure	75.980,00	6.568,64

Poznan Meeting

Work and Budget Plan	Expected	Remaining	
Meetings	57.160,00	9.700,55	2.160 € LOS
Training Schools	17.700,00	8.004,91	
STSM	1.000,00	690,00	50 x 1.100 € Reimbursement MCM and WGC
ITCG		3.000,00	
VBG		600,00	
Dissemination		- 190,00	
Other (OERSA)	120,00	773,00	
Total Science Expenditure	75.980,00	6.568,64	

ESoA

Work and Budget Plan	Expected	Remaining	
Meetings	57.160,00	9.700,55	2.700 € LOS
Training Schools	17.700,00	- 8.004,91	
STSM	1.000,00	690,00	10 x Students Grants + Travel Reimbursement
ITCG		3.000,00	
VBG		600,00	
Dissemination		- 190,00	
Other (OERSA)	120,00	773,00	1 x Trainer Reimbursement
Total Science Expenditure	75.980,00	6.568,64	

STSMs

Work and Budget Plan	Expected	Remaining
Meetings	57.160,00	9.700,55
Training Schools	17.700,00	- 8.004,91
STSM	1.000,00	690,00
ITCG		3.000,00
VBG		600,00
Dissemination		- 190,00
Other (OERSA)	120,00	773,00
Total Science Expenditure	75.980,00	6.568,64

1.000 €
STSM

OERSA

Work and Budget Plan	Expected	Remaining
Meetings	57.160,00	9.700,55
Training Schools	17.700,00	- 8.004,91
STSM	1.000,00	690,00
ITCG		3.000,00
VBG		600,00
Dissemination		- 190,00
Other (OERSA)	120,00	773,00
Total Science Expenditure	75.980,00	6.568,64

120 €
Bank Fees



Reallocation

Work and Budget Plan	Expected	Remaining
Meetings	57.160,00	9.700,55
Training Schools	17.700,00	- 8.004,91
STSM	1.000,00	690,00
ITCG		3.000,00
VBG		600,00
Dissemination		- 190,00
Other (OERSA)	120,00	773,00
Total Science Expenditure	75.980,00	6.568,64

8.200 €
Reallocated to cover **Training Schools** and **Dissemination**

6.568,64 €
To be distributed among **STSM, ITCG, VBG**

Formal approval from the MC Members

Budget Y3

Work and Budget Plan	Budget
Meetings	153.000,00
Training Schoolss	19.500,00
Short-Term Scientific Mission Grant	12.865,00
Inclusiveness Target Countries Conference Grant	1.000,00
Dissemination Conference Grant (VBG)	2.000,00
Dissemination	700,00
Other Expenses Related to Scientific Activities (OERSA)	500,00
Total Science Expenditure	189.565,00
FSAC	28.434,75
Total Grant	217 999,75



NEW Grant Holder Manager

Natascia De Fenzo
CNIT
natascia.defenzo@cnit.it



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Training Days - General:

- the Call will be launched 3 months prior to the meeting;
- the deadline for proposals is 2 months prior to the meeting;
- meetings will start on Tuesday or Wednesday, so that Training Days can be held on a weekday.

Training School - General:

- the Call has been launched by the beginning of January;
- the deadline for proposals was by mid February;
- the evaluation result was announced by early March.

Training Schools

TRAINING EVENTS

Dissemination is a key component of the Action, given its R&D dimension, together with the development of basic technology and the training of researchers. INTERACT addresses this matter by carrying out a number of initiatives, open to the community at large, namely, Training Schools and Training Days, which are as follows:

- **Training Day:**
 - a training event with a duration of half or full day, to be held the day prior to a Management Committee Meeting or a Technical Meeting;
 - organised by INTERACT;
 - with lecturers from INTERACT;
 - there is no financial support to these events (neither to trainers nor to trainees);
 - the application and organisation of these events should follow the [Guidelines](#);
 - the programme should follow the [Programme Template](#) and speakers should provide information according to the [Speaker Template](#).
- **Training School:**
 - a training event with a duration of 2 to 5 days, to be held autonomously;
 - organised by INTERACT or jointly with other Actions, projects or scientific entities;
 - with lecturers not only from INTERACT but also from other entities external to the Action;
 - there is usually financial support to these events, to both trainers and trainees (rules are given below);
 - the application and organisation of these events should follow the [Guidelines](#);
 - the programme should follow the [Programme Template](#) and speakers should provide information according to the [Speaker Template](#).

FINANCIAL SUPPORT

TRAINEES

CA20120-INTERACT offers a limited financial support to Trainees (eligible INTERACT's members, as defined in the [Announced Rules for COGT Actions](#), i.e., only from Members or from Near Neighbour Countries) to attend Training Schools. The selection will be based on applications and on the following priorities:

1. Ph.D. students (one grant per Country);
2. while grants available, Young Researchers (one grant per Country);
3. while grants available, other applicants.

In any of the above steps, ICT countries and gender balance will be taken for resolving equality.

Applicants should use the [Trainee Application Form](#). Details (e.g., deadlines) will be provided for each School.

Trainees will be granted an amount based on a daily allowance, which is defined according to the host country and the School duration. Prior to the Training School, each Trainee granted financial support must register at e-COGT, <https://e-services.cost.eu>, namely by creating a profile that includes the details of a bank account for payment.

For each Training School, specific information will be provided.

TRAINERS

CA20120-INTERACT offers a limited financial support to Trainers to lecture at Training Schools.

The following items can be reimbursed: travel, accommodation and meal expenses, in line with the eligibility rules specified in [Announced Rules for COGT Actions](#); no lecture fees or honoraria will be paid. Each Trainer granted financial support must register at e-COGT, <https://e-services.cost.eu>, namely by creating a profile that includes the details of a bank account for payment.

TEMPLATES & USEFUL DOCUMENTS

- Training Day_Programme
- Training Day_Lecturer
- Training School_Programme

<https://interactca20120.org/meetings-events/training-schools>



Training Days in 2023:

- Dubrovnik
 - *How to Prepare an Excellent Presentation (or at Least an Acceptable One)?*, Luis M. Correia (IST-U.Lisbon) and Krzysztof Cichon (Poznan U.T.)
- Barcelona:
 - *Recent Advances in Data Engineering for Networking*, Engin Zeydan and Josep Mangués, (CTTC).
- Poznan:
 - *State of the art radio channel sounding and data analysis*, Sana Salous (Durham U.) and Diego Dupleich (T.U. Illmenau).



Training Schools in 2023:

- 26-29 June 2023
 - *DolCom 2023 - Summer School & Workshop on Radio Communications in the Dolomites.*
- 4-8 Sep. 2023
 - *Short-Range Radio Propagation: Theory, Models and Applications*



3th Training School: DolCom 2023 - Summer School & Workshop on Radio Communications in the Dolomites

- Dates: 2023 June 26th - 29th
- Location: Campitello di Fassa, Trentino-Alto Adige, Italy
- Organisers: Luis M. Correia, Roberto Verdone
- Duration: 16 hours training + PhD contest
- Format: in-person
- Speakers: 8 (7 academia + 0 I&D&I centre + 1 industry)
- Grants: 12 awarded, 2 refused
- Attendance: 17





4th Training School: *Short-Range Radio Propagation: Theory, Models and Applications*

- Dates: 2023 September 4th - 8th
- Location: Cesenatico, Italy
- Organiser: Vittorio Degli Esposti
- Duration: 28 hours training + 3 hours demo
- Format: in-person
- Speakers: 8 (6 academia + 1 I&D&I centre + 1 industry)
- Grants: 10 awarded
- Attendance: 26



And what else?

- Luis M. Correia is stepping down from HA3 Co-Chair.

But still:

- Let us know what topics you would be interested in having in a Training Event.



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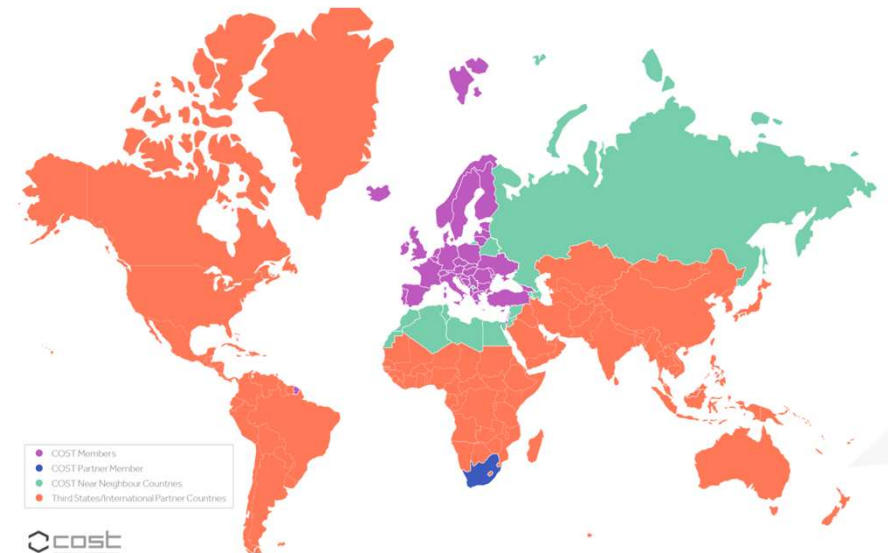
Thursday (11:30am)

15. Feedbacks from Working Group Chairs
16. Feedbacks from Liaisons
17. Action points



STSMs are **exchange visits** aimed at supporting **individual mobility, strengthening existing networks** and **fostering collaboration** between researchers. The aim [...] is to **contribute to the scientific objectives** of a COST Action [...] by allowing scientists to go to an **institution or lab in another COST country** to foster collaboration, to learn a **new technique** or to **take measurements** using instruments and/ or **methods not available** in their own institution/ lab.

- BOTH home & host institutions MUST be INTERACT partners
- Details: <https://interactca20120.org/grants/stsm>
- Applications: <http://www.cost.eu/STSM>
- Apply **at least 1 month** before mission starts
- **Up to 1.200 euro** / grant.





The aim of ITC **Conference Grants** is to **support PhD students** and **Early Career Investigators (ECI)** from **INTERACT institutions** located in **Inclusive Target Countries (ITC)** to attend **international science and technology-related conferences** not specifically organized by the COST Action.

- Inclusive Target Countries (as of March'22):
Albania, Bosnia and Herzegovina, Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Greece, Hungary, Lithuania, Latvia, Malta, Moldova, Montenegro, Poland, Portugal, Romania, Slovenia, Slovakia, Republic of North Macedonia, Republic of Serbia and Turkey.
- Virtual or physical attendance (annotated rules).
- Grants:
 - Up to **1000 euro** / grant to partly cover travel expenses
- Details: <https://interactca20120.org/grants/itc-conference-grants>



To support activities leading to a **strong** visibility of the INTERACT COST action.

To support initiatives aimed to **significantly** increase the visibility/raise the profile of **female** researchers in the research community and beyond.

- In conference/events organized by THIRD parties:
 - MC/Technical meetings, training days/schools, other events organized by INTERACT excluded.
- Physical attendance only
- Open to all researchers enrolled in INTERACT (must be)
 - Priority to *young*, female researchers, and regular participants to INTERACT meetings (*ceteris paribus*).
- Evaluated in monthly batches: within first week
- Grants:
 - **Indicatively 1000 euro** / grant (partly cover travel expenses)
- Details: <https://interactca20120.org/visibility-booster-grants-vbg/>



- Still **some budget left** for STSMs, ITCGs and VBGs .
- All **activities must end before Oct 31, 2023** (end of current Grant Period.
- **STSMs**: Allow for 1 month for evaluation → **Apply this week**...or beginning of next one (at the very latest)
- **Visibility Booster Grants**: evaluated in monthly batches → **Apply before Sept 30**
- **ITC Grants**: a bit **more flexible**.
- If interested, please, **apply soon** !!
- For any question or clarification, do not hesitate contact carles.anton@cttc.es



Tuesday Morning Session 1

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- LinkedIn (<https://www.linkedin.com/company/interactca20120>): 429 followers

EVENT-BASED

- Announcements/reminder meetings, TTs, etc.
- Call for STSMs, TTs, grants, etc.
- Newsletters, leaflet

SCIENCE COMM WEEKLY

- Selected TDs from WGs
- White papers
- Joint papers

DATASETS WEEKLY

- Short description of dataset, link to paper, contacting author
- Starting week 27/28

TESTIMONIALS

- STSMs
- TTs: participants w/ grant

Two LinkedIn posts from the INTERACT group. The top post, dated June 13, 2020, announces the 2nd Technical Meeting in Lyon, France, from June 13th to 15th. It includes a photo of a bridge over a river and a 'View event' button. The bottom post, dated May 20, 2020, is a call for applications for a grant for a training school on 'Mobile Radio Propagation on 5G and Beyond'. It includes a photo of an outdoor event and a 'Promote' button.

Two LinkedIn posts. The top post, dated May 12, 2020, discusses the availability of real sensor data for testing and validating the capabilities of 4V2X communication for autonomous vehicles. It includes a photo of a highway and a 'Promote' button. The bottom post, dated May 12, 2020, mentions researchers from ONY, LLC finding out that the #interactca20120 depends primarily on the window surface percentage and the construction material. It includes a photo of a brick building and a 'Promote' button.

A LinkedIn post dated May 12, 2020, discussing the dynamic nature of vehicular traffic and road surroundings. It mentions that 4V2X propagation characteristics vary greatly on both small and large scale, which makes predicting the Quality of Service a difficult task. The post includes a map showing a test loop with speed zones (Above 32 Mbps, 20-32 Mbps, 12-20 Mbps, Below 12 Mbps) and a 'Promote' button.

A testimonial post for the 1st Training school ESoA Course. It features a quote from Hira Manzoor, a PhD student at Gdansk University of Technology, who attended the course on 'Mobile Propagation for 5G and Beyond'. She expresses her gratitude for the training school and its role in clarifying her research. The post includes a photo of Hira Manzoor and the hashtag #INTERACTCA20120.



- Available on various platforms (YT, anchor, spotify)
- Host: Prof. Adrian Kliks (Poznan University of Technology)
- Episodes
 1. Laurent Clavier
 2. Conchi Pardo
 3. Thomas Zemen
 4. Ana Garcia Armada





Newsletter

5th issue

Editor: Agnieszka Czapiewska

Leaflet

Update available

Also in print-friendly version

<https://bit.ly/3DQgzHb>



SCICOMM MEETING:
WED AT 17:30 in room 123
 Proposal: first selection, confirm during/after meeting

I would like to announce the fifth issue of the INTERACT Newsletter!

This issue appears after the fifth technical meeting in Barcelona. Therefore, you will find highlights from all working groups. Some of these groups are preparing white papers and INTERACT sessions or workshops on international events so the discussions were vivid.)

In this issue the floor is given to Sana Salous, Professor at Durham University (United Kingdom) who is the organizer of the Women in Radio Science initiative and Diego Duplich



Agnieszka Czapiewska
Gdansk University of Technology, Poland

from Technische Universität Braunschweig, a subworking group "mmWave and THz sounding" chair.

There are also some announcements about available grants and the upcoming COST INTERACT Machine Learning Challenge.

Enjoy the reading!



The next milestone, by developing the next generation of radio communication networks, 6G.

The Intelligence-Enabling Radio Communications for Seamless Inclusive Interactions (INTERACT) vision is to go beyond the capabilities of the 5G and to make the radio network itself intelligent, meaning aware, adaptive and parsimonious.

Challenges include:

- 1) Fundamental research in the fields of antennas and propagation, signal processing and localization, network architectures and protocols, to design intelligent-enabling radio communications;
- 2) Exploitation of Machine Learning tools for the implementation of many aspects of this network intelligence;
- 3) Collecting real-world data and making them available to the research community by building the INTERACT datasets.

This COST action started in October 2021 and ends in October 2026.

perception of no intermediary. In a long-term vision, wireless networks will not only become intelligent, but they will constitute the nervous system to foster intelligence in other systems, such as transportation, factories and cities.

This COST action started in October 2021 and ends in October 2026.

The action organizes three meetings per year, training schools, workshops and provides grants for Short-Term Scientific Missions (STSMs).

INTERESTED TO JOIN AND PARTICIPATE? BECOME A MEMBER THROUGH: [HTTP://E-SERVICES.COST.EU/!](http://e-services.cost.eu/)

WWW.COST.EU

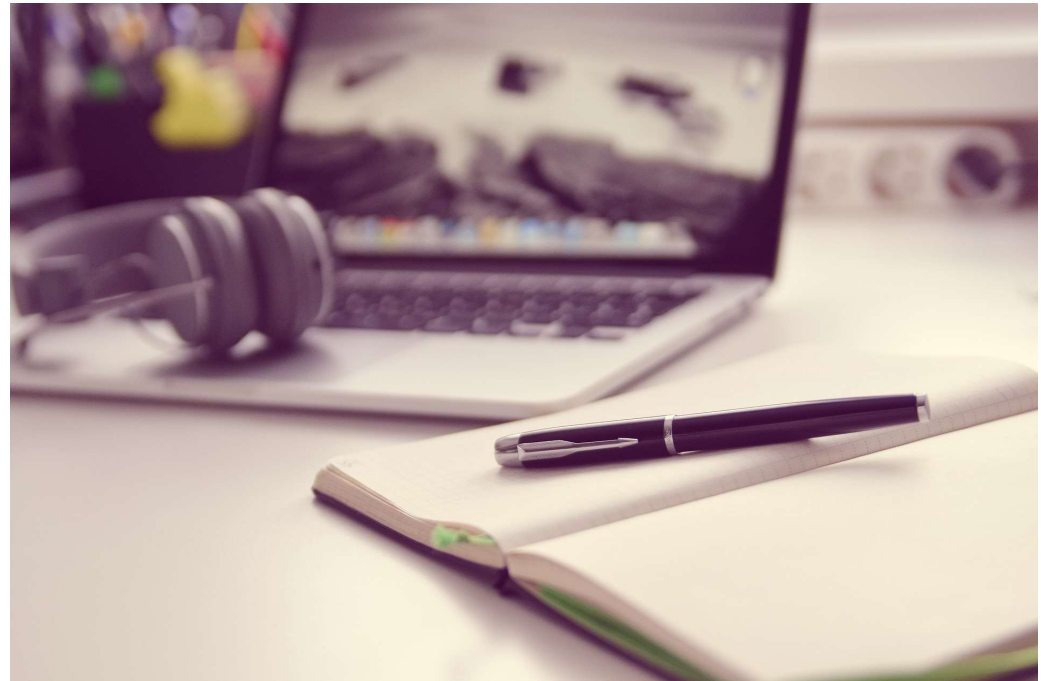


Laurent Clevier IMT Nord Europe, France	Chair	Science Communication Coordinator	Margot Deruyck Ghent University – MEC, Belgium
Chiara Buratti Consejo Nazionale Interuniversitario per le Telecomunicazioni (CNT), Italy	Vice-chair	Training Coordinator	Luis M. Corral Instituto Superior Técnico – University of Lisbon, Portugal
Chiara Buratti Consejo Nazionale Interuniversitario per le Telecomunicazioni (CNT), Italy	Grant Holder / Scientific Representative	Open Award Coordinator	Carlos Arto-Haro CITIC, Spain
		Young Researchers Representative	Franческа Conserve Consejo Nazionale Interuniversitario per le Telecomunicazioni (CNT), Italy

- Promo video was shot during the Barcelona meeting
- Available on: <https://youtu.be/z8ssKhCEovo>



- Liaisons
 - Organized special sessions/workshops
→ **SINCE START OF THE ACTION!**
- Email to: margot.deruyck@ugent.be





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- 40th Anniversary of COST actions in telecommunications
 - Lisbon (PT) – January 2024 – Organised by Prof. Luis M. Correia
 - COST Actions: 207, 231, 259, 273, 2100, IC1004, CA15104, CA20120
 - Dedicated pages on our current website
 - Testimonials: <https://interactca20120.org/anniversary-testimonials/>
 - Memories: <https://interactca20120.org/anniversary-memories/>
 - Quest for input: <https://interactca20120.org/anniversary-quest/>
 - Looking for
 - Testimony of your view about these action series (video/sentence/text)
 - Photos or videos of meetings you attend (proper credit will be given)
- Email contributions to vera.almeida@inov.pt
- For testimony: add a photo of yourself (with name and affiliation)





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COST INTERACT Machine Learning Competitions

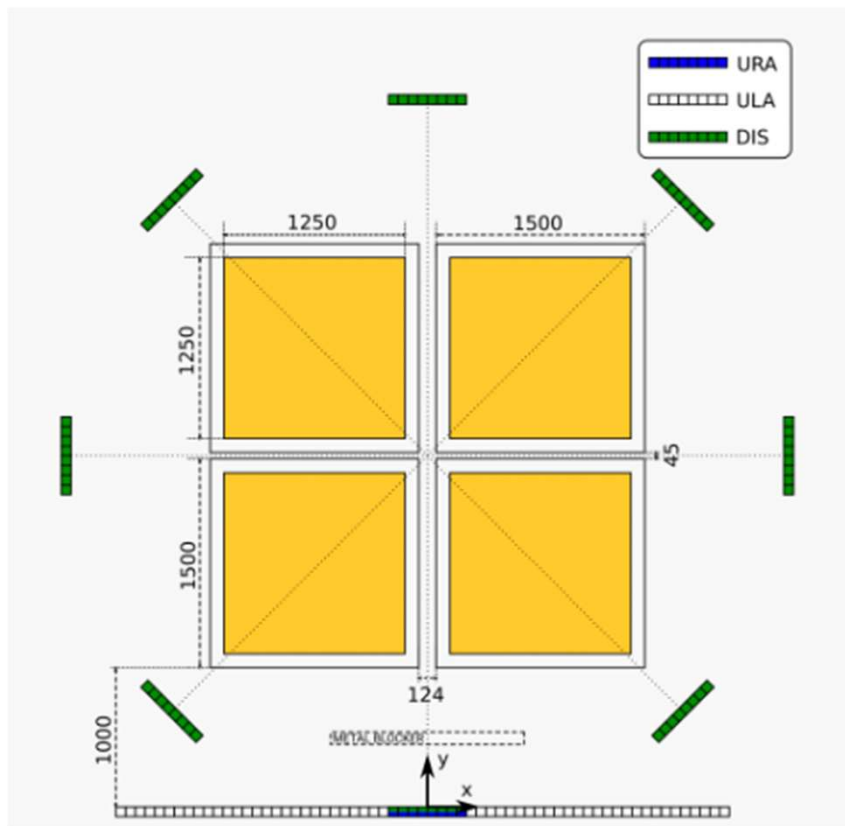
2 Competitions: PHY and NET layer

Datasets from HA1

PHY: ML-based direct indoor localization using Massive MIMO CSI Measurements

NET: Calibrated regression of 5G KPI Measurements

COST INTERACT Machine Learning Competitions - PHY



Dataset:

Sibren De Bast, Sofie Pollin, February 9, 2021, "Ultra Dense Indoor MaMIMO CSI Dataset", IEEE Dataport, doi: <https://dx.doi.org/10.21227/nr6k-8r78>.

Massive MIMO CSI measurements collected in an indoor environment with different antenna deployments.

Goal: Minimize positioning error

Evaluation criteria

PHY

Minimum positioning error on a held-out test set

$$\text{RMSE}_x = \frac{1}{N} \sum_{i=1}^N \sqrt{(\hat{x}_i - x_i)^2}$$

$$\text{RMSE}_y = \frac{1}{N} \sum_{i=1}^N \sqrt{(\hat{y}_i - y_i)^2}$$

$$\text{RMSE}_{\text{total}} = \frac{\text{RMSE}_x + \text{RMSE}_y}{2}$$



COST INTERACT Machine Learning Competitions - NET

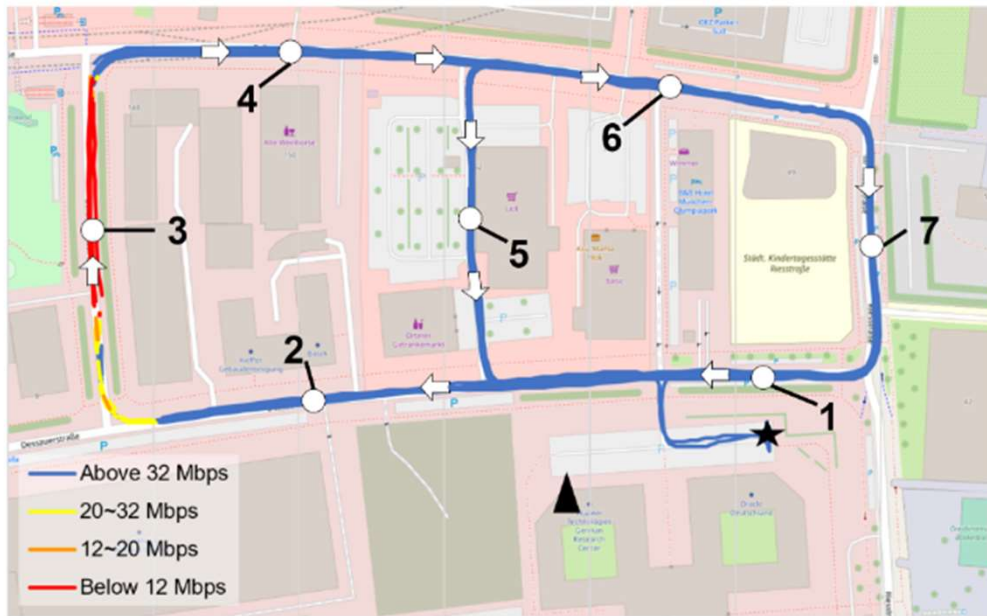


Fig. 2: Map showing UL throughput measurements. The test vehicle route traversed the double loop 10 times and is marked with GPS track in 4 colors representing throughput intervals. Base station antenna at top of the building (black triangle), 21m above ground. Vehicle antenna height: 1.5m.

Dataset:

Mate Boban, Chunxu Jiao, Mohamed Gharba, October 24, 2022, "Huawei_MRC_V2I_measurement_data", IEEE Dataport, doi: <https://dx.doi.org/10.21227/r1wm-6a24>.

KPI Measurements collected from a moving vehicle over a 5G network in the city of Munich

Goal: Calibrated regression of KPIs



Evaluation criteria

NET

$$\text{MAE} = \frac{1}{N} \sum_{i=1}^n |\hat{y}_i - y_i|$$

$$\text{EC}_X = \frac{|\{y_i \leq \hat{Q}_i^X\}|}{N}$$

$$\text{CE}_X = \left| \text{EC}_X - \frac{X}{100} \right|$$

$$\text{Sharpness}_{X\%} = \frac{1}{N} \sum_{i=1}^N |\text{High}_X - \text{Low}_X|$$

Calibrated regression (i.e. predictive intervals matching empirical intervals)

Metrics: MAE, Calibration error (CE), Sharpness

And the winners are:

PHY Challenge (12 teams):

1° Jiteng Ma, Liang Qiao (Bristol).

2° Mounssif Krouka, Sabbir Ahmed, Yazid Bounab (Oulu).

3° Artan Salihu, Stefan Schwarz (Wien).

4° Praneeth Susarla, Krishna Bulusu, Pravallika Katragunta, Anirban Mukherjee (Oulu).

NET Challenge: (2 teams):

1° Jiteng Ma, Liang Qiao (Bristol).



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Core group meeting THU 26/09 – 14:00 CET.

In the next meeting we need to elect two persons.

- To replace Luis Correia as **HA3 co-chair** and as **Training Coordinator** in the **steering committee**. (One position.) Please apply.
- To replace Dr Agnieszka Czapiewska as **Young Researcher Representative**. (One year position.) Please apply.



Upcoming Meetings

Seventh MC meeting and technical meeting

Jan. 22-25, 2024 (special one) – Lisbon

Eighth (and following) MC meeting and technical meeting

Ninth (and following) MC meeting and technical meeting

Proposals

Helsinki (FI)

Linz (AT)

Istanbul (TR)



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INTERACT

This meeting

Poznan MEETING / 11-14 September 2023

Monday 11/09

Tuesday 12/09

Wednesday 13/09

Thursday 14/09

08:30 Welcome

Room 123

PLENARY (Room 123)	
Management Committee meeting	
General Information	

10:30 Coffee break

PLENARY (Room 123)	
Keynote	Marcin Dryjanski
Recent Advances in O-RAN	
Discussion	Mate Boban, Vittorio Degli-Esposti
White paper on Channel modeling	

12:30 Lunch

08:30 Welcome

Room 123

Single session (Room 123)	
17	Spectrum Options and Allocations for 6G
14	Channel & Physical Layer Security
37	ISAC Definition

10:30 Coffee break

Room 123	Room 122	Room 128
SW12	WG1-WG2	WG3-VT2
RIS	MIMO	RRM
42	45	53
41	20	18
10	52	49
Disc SW12		

12:30 Lunch

08:30 Welcome

Room 123

PLENARY (Room 123)	
Keynote	Dr. Jim Lansford
IEEE 802.11 standards	
10:00 Keynote	Tommy Svensson
HEXA-X-II: challenges and perspective	

11:00

Room 123

PLENARY (Room 123)	
Management Committee meeting	

13:00 Lunch

13:30 Welcome

Training Session	
-------------------------	--

15:30 Coffee break

Training Session	
-------------------------	--

17:30

Room 121

SC meeting	
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18:00

Room 123	Room 122	Room 128
VT4+WG1	SW21-SW11	VT1
Cuty/Buildings	ISAC & Channel	Health
19	22	12
44	25	3
1		15
Disc VT4	Disc SW21	Disc VT1

15:30 Coffee break

Room 123	Room 122	Room 128
VT3+SW11	WG2	SVT11
IIoT / Channels	Localisation	EMF
23	16	43
2	11	26
Disc VT3	Disc WG2 LOC	Disc SVT11

17:30

18:30

Room 123	Room 122	Room 128
WG1	WG2	VT2 (WG3)
Channels	PHY Layer	Mobility
47	46	4
39	40	50
38	24	51
27		Disc VT2

15:30 Coffee break

Room 123	Room 122	Room 128
WG1	WG2 - SW21	WG3
Channels	PHY Layer	Radio Access
	21	
	13	
Disc WG1 & SW11	Disc WG2	Disc WG3
White Paper	Next White Paper	

17:30

Newsletter meeting

Departure to social event and dinner		
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INTERACT

This meeting

Tuesday 12/09

08:30 Welcome

Room 123

09:00	PLENARY (Room 123)		
	Management Committee meeting		
	General Information		

10:30 Coffee break

11:00	PLENARY (Room 123)		
	Keynote	Marcin Dryjanski	Recent Advances in O-RAN
	Discussion	Mate Boban, Vittorio Degli-Esposti	White paper on Channel modeling

12:30 Lunch

Keynote after the break
And presentation of the **White Paper on Channel Modeling**

Thursday 14/09

08:30 Welcome

Room 123

09:00	PLENARY (Room 123)		
	Keynote	Dr. Jim Lansford	IEEE 802.11 standards
10:00	Keynote	Tommy Svensson	HEXA-X-II: challenges and perspective

11:00

And two **keynotes**
Thursday morning

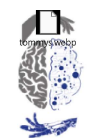
At 11:00... Keynotes

11:00 – 12:00 Marcin Dryjanski, Ridmeo Labs, PUT
Recent Advances in O-RAN



12:00 – 12:30 Mate Boban, Vittorio Degli-Esposti
White paper on Channel modeling





Thursday at 9:00... Keynotes

Dr. Jim Lansford

IEEE 802.11 standards



Tommy Svensson

HEXA-X-II: challenges and perspective





Wednesday 13/09	
08:30	Welcome
Room 123	
09:00	single session (Room: 123)
17	Spectrum Options and Allocations for 6G
14	Channel & Physical Layer Security
37	ISAC Definition
10:30	Coffee break

WED morning, 9am

A single session

[TD17] W.K. Alsaedi, H. Ahmadi, Z. Khan and D. Grace, *“Spectrum Options and Allocations for 6G: A Regulatory and Standardization Review”*

[TD14] A.B. Kihero, H.M. Furqan, M.M. Şahin, H. Arslan, *“6G and Beyond Wireless Channel Characteristics for Physical Layer Security: Opportunities and Challenges”*

[TD37] Y. Miao, C. Smeenk, *“What is the definition of ISAC from COST INTERACT?”*

COST Action
Progress Report at 24 months
(18/10/2021 to 18/10/2023)

**CA20120: Intelligence-Enabling Radio
Communications for Seamless Inclusive
Interactions**



Summary

The main aim and objective of the Action is to

make future wireless networks become intelligent by taking advantage of cutting-edge technologies to cope with the increasing demand for connectivity and traffic density, in order to enhance the human experience of both human-to-human and human-to-machine communications, to make it seamless, with the perception of no intermediary

During its first two years the Action progressed the achievement of this as described below

The Action will implement the following measures in the coming two years to overcome any issues identified in this report as potentially endangering the achievement of the objectives of the Action

Action website

<http://interactca20120.org/>

SAFE



Achievement of MoU objectives, deliverables and additional outputs/ achievements

MoU objectives

Please self-assess and describe the level of achievement of each MoU objective. For any MoU objective that is 25% or less achieved, please add an explanation.

Mou objective	To perform fundamental research in the fields of antennas and propagation, signal processing and localisation, and network architectures and protocols, to design intelligent-enabling radio communications.
Type of objective	
Level of progress	—
Description of progress with achieving the MoU objective	



Deliverables

This section covers only deliverables that were foreseen for the Action, not additional outputs that were generated during the Action (these additional outputs will be added in the following section). Please select and comment on the progress with achieving each deliverable.

For deliverables that are:

- Delivered, please provide proof to enable the Action Rapporteur to confirm the delivery
- Not delivered but delivery is foreseen within 2 years please explain how the delivery will be achieved
- Not foreseen to be delivered please explain why not

Deliverable	D1: State-of-the-art and key challenges on disciplinary work on Radio Channels, Signal Processing and Localisation, and Network Architectures and Protocols, and on interdisciplinary work related to Health & Well-Being, Transportation, Industrial Automation, Smart Buildings and Cities applications.		
Progress with achieving deliverable	—	Month deliverable due	12





Additional outputs / achievements

Co-authored Action publications

Please enter below ONLY publications (including publications that are submitted but not yet accepted):

- that are on the topic of the Action, and
- that are co-authored by at least two Action participants from two countries participating in the Action, and
- for which the Action networking was necessary.

Please pay special attention to the COST Excellence and Inclusiveness policy and ensure the inclusion of publications with authors from COST Inclusiveness Target Countries (ITCs), from the underrepresented gender in the Action and from Early Career Investigators/Young researchers.

Bibliographic data	Countries participating in the Action among authors	Open Access	COST cited?	COST funds?	Relevance to H2020 Societal challenge	Peer Reviewed?

Projects resulting from Action activities

Please enter below all the projects on the topic of the Action resulting from Action activities, involving at least one Action participant, and for which the Action networking was necessary.

The Action reported 0 project(s) and 0 proposal(s) resulting from the Action networking.

#	Title	Countries participating in the Action among proposers	Main proposer name	Funder	Amount	Call identifier	Relevance to H2020 Societal Challenge



Additional outputs / achievements

Co-authored Action publications

Please enter below ONLY publications (including publications that are submitted but not yet accepted)

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Bibliographic data	Countries participating in the Action among authors	Open Access	COST cited?	COST funds?	Relevance to H2020 Societal challenge	Peer Reviewed?

Fill the on-line google sheet or send to Laurent and Natascia

Projects resulting from Action activities

Please enter below all the projects on the topic of the Action resulting from Action activities, involving at least one Action participant, for which the Action networking was necessary.

The Action reported 0 project(s) and 0 proposal(s) resulting from the Action networking.

#	Title	Countries participating in the Action among proposers	Main proposer name	Funder	Amount	Call identifier	Relevance to H2020 Societal Challenge

Send to Margot, and Natascia

DRY



Other outputs / achievements

Please enter below any additional outputs/ achievements on the topic of the Action that contribute to the COST mission: "COST enables break-through scientific



developments leading to new concepts and products and thereby contributes to strengthen Europe's research and innovation capacities", and for which the Action networking was necessary (e.g. a patent, standards, white paper).

Output / achievement description	Dependence of achievement on the Action networking



Other outputs / achievements



**Send to Margot,
and Natascia**

Please enter below any additional outputs/ achievements on the topic of the Action that contribute to the overall goal of the Action. COST enables break-through scientific



developments leading to new concepts and products and thereby contributes to strengthen Europe's research and innovation capacities", and for which the Action networking was necessary (e.g. a patent, standards, white paper).

Output / achievement description	Dependence of achievement on the Action networking



Impacts

Please describe the impacts (the short- to long-term scientific, technological, and / or socioeconomic changes produced by a COST Action, directly or indirectly, intended or unintended) that have resulted, or might result, from the Action in the following table (one impact per line).

Description of the impact, i.e. what will change, and for whom, as a result of what the Action achieved	Type of impact	Timing of impact

Please describe how the Action is advancing the careers, skills and network of researchers, including ECIs (for example: joint supervision of graduate and PhD students, research exchanges not funded by the Action, collaborations, Training Schools with ECTS accreditation, joint projects and jobs prospects).



Dissemination and exploitation of Action results (other than co-authored Action publications listed previously)

Please describe the Action's dissemination and exploitation approach as well as all activities undertaken to ensure dissemination and exploitation of the Action results and the effectiveness of these activities.

Dissemination and exploitation approach of the Action

Dissemination

Dissemination meetings funded by the Action (possible only until 31st October 2021)

Title of Dissemination meeting	Meeting date	Meeting country	Action participant	Event name and hyperlink to the website	Title of presentation	Description of added value to the Action
N/A						



Dissemination and exploitation of Action results (other than co-authored Action publications listed previously)

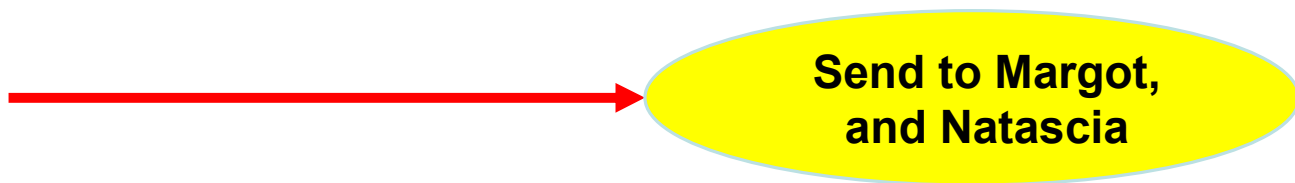
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Dissemination and exploitation approach of the Action

Dissemination

Dissemination meetings funded by the Action (possible only until 31st October 2021)

Title of Dissemination meeting	Meeting date	Meeting country	Action participant	Event name and hyperlink to the website	Title of presentation	Description of added value to the Action
N/A						



OK

Other dissemination activities

E.g. participation to non-Action meetings, e.g. EU Parliament, meetings with policy makers, experts in the field, regional authorities.

Item/activity	Target audience	Outcome	Hyperlink
N/A			

Exploitation activities

Please describe below any activities undertaken to ensure exploitation (use, in particular in a commercial context) of the Action's achievements.

Item/activity	Target audience	Outcome
N/A		

Other dissemination activities

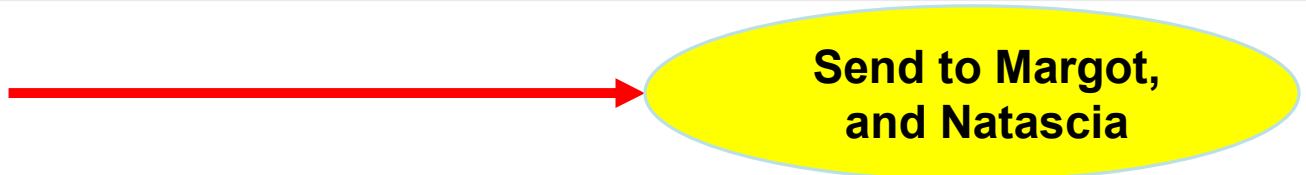
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N/A			

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Item/activity	Target audience	Outcome
N/A		





Other matters

This section is confidential to the Management Committee, the Action Rapporteur and the COST Association, and is not included in the version of the report that is published on the COST website.

Difficulties in implementing the Action

If any difficulties are experienced in the implementation of the Action (e.g. imbalances of participation across the Working Groups, inactive country representatives) please describe these below. Please also describe the efforts made by the MC to address these.

Endangerment Measures

Taking into account the issues identified throughout this report, please summarise the measures the Action will implement in the coming two years to overcome any issues identified as potentially endangering the achievement of the objectives of the Action.



Suggestions for improvements to COST framework/ procedures

The mandate of the Scientific Committee includes providing advice to the COST Committee of Senior Officials on possible improvements to the COST framework. Please describe below any improvements that you believe should be made to the COST framework.

Sustaining the network beyond the Action

Are there any plans to sustain the network beyond the end of the Action?

Emerging topics/ developments in the field of the Action

Please describe any emerging topics or potentially important future developments identified during the Action and that could potentially be addressed by future COST activities such as Actions S&T Conferences or Exploratory Workshops.



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Send to me



In addition to traditional points (training school, training day, STSMs...), I suggest the following discussions

- **WG1** - finalize the white paper.
- **WG2** – progress about White paper on *novel physical layer technologies and localization algorithms for future wireless networks* (planned Mid June 2024).
- **WG3** – start thinking about White paper on *novel network architectures and protocols for future wireless networks* (planned October 2025 so we have time).
- **All WGs and verticals** - in **Mid October 2024** we planned a deliverable "*disciplinary solutions to the research challenges (preliminary draft of the final report)*" I encourage you to already think about how we should build this deliverable.
 - Could be the White Paper for WG1, with possible additions linked to progress
 - Could be the White paper for WG2
 - Could be an initial draft of the white paper for WG3
- **VTs**: I would like VTs to identify what is (are) the specific challenge(s) related to their VT, how they progress on it, what they would need to solve the issues. It could be a couple of slides that we could discuss at the final plenary or keep for Lisbon.
- **HA1**: All involved – next challenge? New databases? What should we look for?



- **ALL**
 - Publications
 - Projects resulting (partly) from the action
 - Other achievements (Scientific)
 - Dissemination (workshop; INTERACT sessions, expertises, other groups, standardization ...)
 - Exploitation activities
 - Any ideas you have to improve the action, its implementation, about its future...

**Plenary resumes on
Thursday at 9:00 am with two keynotes**



Tuesday Morning Session 1

1. Welcome words
2. Adoption of the Agenda
3. Status of the Action and of the current meeting
4. Report from the Grant Holder
5. Training
6. STSM & more
7. Dissemination
8. Lisbon meeting
9. Data sets
10. Next meetings
11. This meeting

Tuesday Morning Session 2

12. Plenary talks

11:00 - Marcin Dryjanski

12:00 - Mate Boban, Vittorio Degli-Esposti

Tuesday afternoon and Wednesday

13. Sessions

Thursday (09:00am)

14. Plenary talks

11:00 - Dr. Jim Lansford

11:45 - Tommy Svensson

Thursday (11:30am)

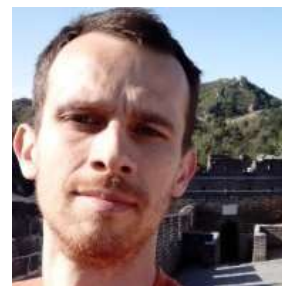
15. Feedbacks from Working Group Chairs
16. Feedbacks from Liaisons
17. Action points

At 11:00... Keynotes

11:00 – 12:00 Marcin Dryjanski, Ridmeo Labs, PUT
Recent Advances in O-RAN



12:00 – 12:30 Mate Boban, Vittorio Degli-Esposti
White paper on Channel modeling





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Enjoy the sessions.



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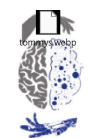
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Enjoyed the sessions?



Thursday at 9:00... Keynotes

Dr. Jim Lansford

IEEE 802.11 standards



Tommy Svensson

HEXA-X-II: challenges and perspective





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- WG1 Vittorio Degli-Esposti, Mate Boban
SWG mmW and THz channel sounding Wei Fan, Diego Dupleich
SWG RIS Di Renzo, Joonas Kokkonen
- WG2 Ana Garcia Amada, Alister Burr
SWG ISAC Yang Miao, Carsten Smeenk
- WG3 Hamed Hamadi, Konstantin Mikhaylov
-
- VT1 Kamran Sayrafian, Slawomir Ambroziak
SVT1 EMF exposure Conchi Garcia Pardo, Wout Joseph
- VT2 Thomas Blazek, Adrian Kliks
- VT3 Golsa Ghiaasi, Raheeb Muzaffar
- VT4 Periklis Chatzimisios, Fernando Velez



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- H2020 Reindeer – Fredrik Tufvesson
- EU-ITN MINTS – Fredrik Tufvesson
- 5G DU-Volution – Alister Burr
- 5G... – Alister Burr
- 6G-IA (SNS) – Carles Anton
- TeamUp5G (MSCA ETN/ITN) – Fernando J. Velez and Ana Garcia Armada
- ETSI ISG for Terahertz Communications (THZ) – Mate Boban, Thomas Kuerner
- DETERMINISTIC6G (SNS) – Raheeb Muzaffar
- PEPR 5G (France Plan de relance) – Laurent Clavier



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AP	WHAT	WHO	WHOM	WHEN
1	Submit reimbursement forms	Those entitled to	e-cost	Before 29/09
2	Send Minutes of Group Meetings	Group Chairs	Chair + Secretary	Before 29/09
3	Send Liaisons summaries	Liaison rapporteurs	Dissemination chair (M. Deruyck)	Before 29/09
4	Publications (Joint)	Authors	Secretary / on-line sheet	When accepted
5	Any ideas to fill mid-term report	All	Chair + Secretary	Before 15/10
5	Liaisons, special sessions/workshops	Organizers	Dissemination chair (M. Deruyck)	When done with short summary
9	Send STSM / ITCG / VBG applications	Those interested	e-cost +Grant Chair (C. Anton)	Open call
10	CORE Group meeting	SC members + WG chairs	Remote meeting	26/09, 2pm CET

Any other Business?



INTERACT

Thank you !

See you in Lisbon

