MiFuture News

Industry news, papers and events related to 6G & MIMO

September 2024

Grant Agreement Number: 101119643
Project Acronym: MiFuture
Project Title: ultra-massive MIMO for future cell-free heterogeneous networks
Call: HORIZON-MSCA-2022-DN-01
Type of action: HORIZON TMA MSCA Doctoral Networks- Industrial Doctorates
Granting authority: European Research Executive Agency
Project start date: 01/01/2024

MiFuture News: Monthly Updates on 6G and MIMO Technologies

MiFuture News is a monthly publication of the MiFuture project, complementing the MiFuture Newsletter, which will be published every six months. While the Newsletter includes internal project updates, MiFuture News features articles and information from external sources freely available on the internet.

This publication aims to gather the most interesting industry news, relevant technical papers, and upcoming events related to 6G and MIMO technologies to share with supervisors and PhD students within the project.

If you come across any interesting news, please share it with us for inclusion in the next issue.

Industry news

Ericsson Welcomes Joint Cooperation by U.S. & Sweden in 6G Technology

August, 26th - Ericsson has welcomed a joint statement by the U.S. and Swedish governments pledging further cooperation on advanced wireless technologies, including 6G. The declaration, made on the 6th of August, is the latest bilateral agreement between Sweden and the U.S. regarding the desire to pool resources, expertise and technology leadership on new, developing and future connectivity technologies.

India gets behind terahertz push for 6G

August, 27th -India's telecom regulator is urging the government and operators to explore the use of terahertz spectrum for new 6G technologies and services.

Researchers Study New Wave Propagation Processes to Improve 5G and 6G Networks

July, 08 - Researchers from the Smart and Wireless Applications and Technologies Group (SWAT-UGR) have conducted two scientific studies aimed at answering a common question: understanding how electromagnetic waves propagate in the medium.

Five things to think about when planning for 6G

August, 14th - The next generation of mobile technology, or 6G, is projected to arrive in around 2030, but work is already underway on standards, technologies and more. As noted by standards body 3GPP in December 2023, delivery of a new mobile generation is a multi-year process, and work on 6G specifications is being planned well in advance.

Ericsson (ERIC) to Boost US-Sweden Connectivity With 6G Technology

August, 26th - Ericsson recently welcomed a joint statement as part of the latest bilateral agreement between the U.S. and Swedish governments aimed at advancing the next generation of connectivity technologies. This collaborative effort signifies a significant step forward in the telecommunication sector, showcasing the company's commitment to technological advancement.

China claims world's first '6G' field test network

July, 15th - A group of Chinese telecom engineers have established what they claim is the world's first field test network for 6G communication and intelligent integration, Chinese newspaper China Daily reported.

How 6G Is Ushering In A More Sustainable Future

August, 26th - With the first commercial 6G deployments expected around 2030, there is a wave of optimism about the applications and services the technology will support. The IMT-2030 framework has outlined six usage scenarios: ubiquitous connectivity, integrated sensing and communication, AI and communication, immersive communication, massive communication, and hyper-reliable and low-latency communication. Beyond these, 6G aims to connect the unconnected, provide ubiquitous intelligence, embrace security, privacy, and resilience, and be sustainable.

KT and LG Partner to Lead 6G and Full-Duplex Tech

August, 16th - South Korean operator, KT, and LG Electronics are working together to develop 6G transmission and full-duplex communication technologies. They will also collaborate on setting global standards for the next generation of cellular systems.

Ericsson extends 5G-6G R&D work with Saudi Arabia's KAUST

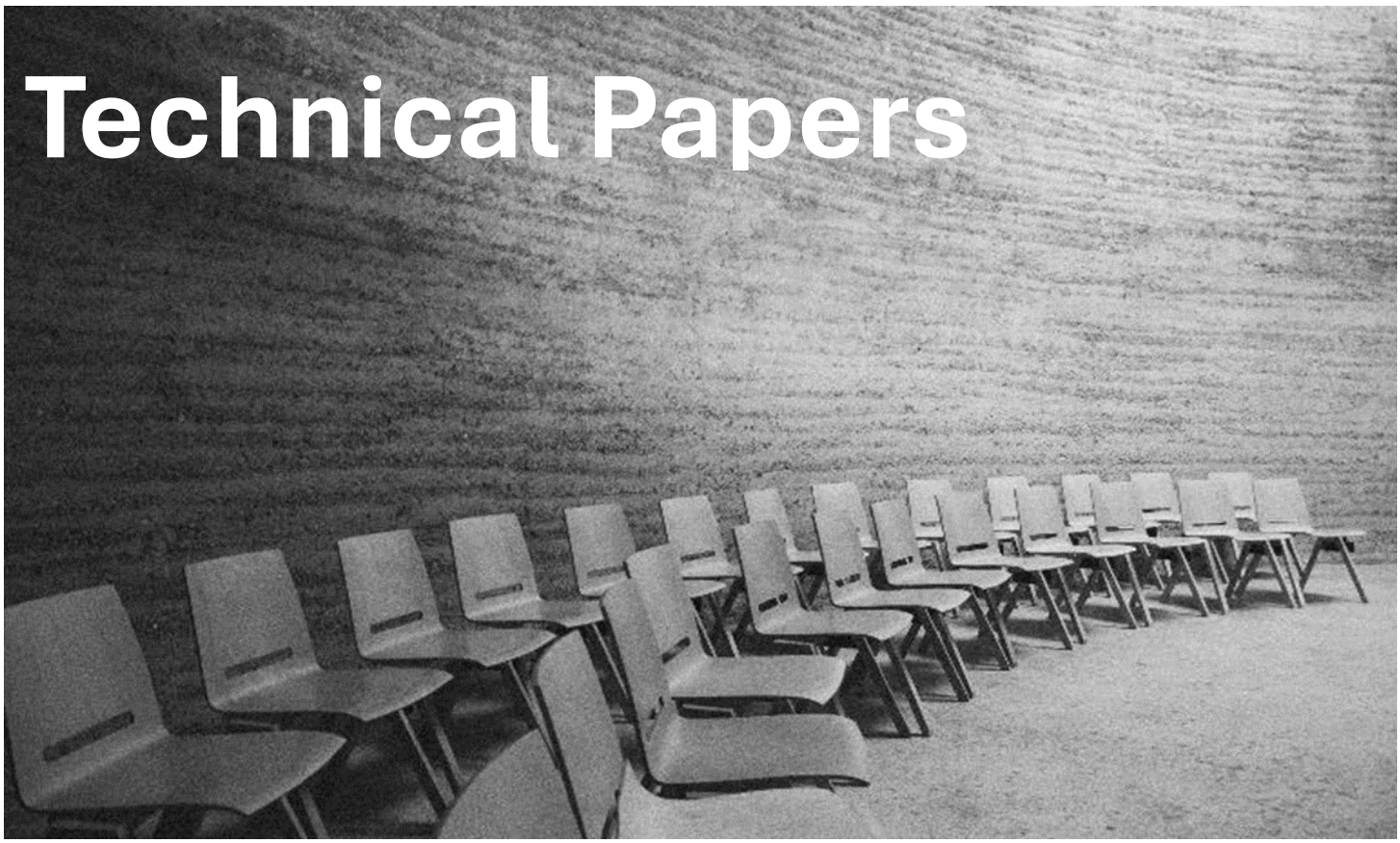
July, 9th - Ericsson announced on Monday it has extended its R&D partnership with Saudi Arabia's King Abdullah University of Science & Technology (KAUST) for another two years to continue research related to 5G and 6G technologies.

SK Telecom, Singtel to develop tools to ease 6G transition

July, 17th - South Korea's SK Telecom and Singapore's Singtel have signed a two-year Memorandum of Understanding (MoU) to use artificial intelligence (AI) and orchestration tools and strengthen their knowledge and expertise of new technologies, like network virtualization, required to transition to 6G.

Indian entities partner to develop 'cell-free' 6G network

August, 8th - Two Indian technology institutes are partnering with the country's Department of Telecommunications to work on developing "cell-free" access points as a potential part of future 6G systems.



6G White Paper on Edge Intelligence

Peltonen, E., Bennis, M., Capobianco, M., Debbah, M., Ding, A., Gil-Castiñeira, F., Jurmu, M., Karvonen, T., Kelanti, M., Kliks, A., Leppänen, T., Lovén, L., Mikkonen, T., Rao, A., Samarakoon, S., Seppänen, K., Sroka, P., Tarkoma, S., & Yang, T. (2020). 6G White Paper on Edge Intelligence. 6G Research Visions, No. 8. University of Oulu.

The white paper outlines a vision for 6G Edge Intelligence, highlighting the importance of data-driven machine learning and AI in future 6G networks. It emphasizes edge computing as a key enabler for intelligent Internet technologies by 2030, with applications in manufacturing, smart devices, urban computing, and autonomous traffic. The focus is on edge computing infrastructure, data management, software development, real-time AI/ML training, and addressing security, privacy, and user concerns. The paper envisions a shift from the Internet of Things to an "Intelligent Internet of Intelligent Things" and provides a roadmap for 6G development.

6G White Paper: Research Challenges for Trust, Security and Privacy

Ylianttila M., Kantola, R., Gurtov, A., Mucchi, L., & Oppermann I., (Eds.). (2020). 6G White Paper: Research Challenges For Trust, Security And Privacy. 6G Research Visions, No. 9. University of Oulu.

The white paper discusses the interconnected roles of trust, security, and privacy in 6G networks, highlighting the multidisciplinary challenges involved in building a trustworthy 6G system. Trust involves embedding trust within the network for enhanced information security, requiring new models, policies, and mechanisms. Security focuses on the growing reliance on IT and networks, stressing the need for holistic security architecture in 6G, with attention to security automation and physical layer techniques. Privacy addresses the challenge of identifying when deidentified data becomes personally identifiable, proposing blockchain, distributed ledger technologies, and differential privacy as potential solutions.

White Paper on Broadband Connectivity in 6G

Rajatheva, N., Atzeni, I., Björnson, E., Bourdoux, A., Buzzi, S., Doré, J.-B., Erkucuk, S., Fuentes, M., Guan, K., Hu, Y., Huang, X. , Hulkkonen, J., Jornet, J. M., Katz, M., Nilsson, R., Panayirci, E., Rabie, K., Rajapaksha, N., Salehi, M., ... Xu, W. (2020). White Paper on Broadband Connectivity in 6G. 6G Research Visions, No. 10. University of Oulu.

This white paper outlines the path to implementing broadband connectivity in 6G wireless systems, focusing on use cases like extreme data rates up to 1 Tbps and high-speed connectivity for railways up to 1000 km/h. Achieving these goals requires integrating terrestrial and satellite networks, supported by various enablers across infrastructure, spectrum, and protocol levels. Key technologies include ultra-massive MIMO, intelligent reflecting surfaces, and THz communications. Protocol advancements will enhance reliability, latency, and efficiency, with a focus on full-coverage broadband connectivity in both urban and remote areas as a primary goal of 6G.

Reinforced Access Stratum security for 6G

Nokia Bell Labs

4G and 5G have put encryption and integrity protection for the radio interface into the upper part of the L2 radio protocol stack, leaving lower layers, such as the Medium Access (MAC) layer without cryptographic protection due to perceived low risk of applicable threats at the time. However, attacks against the unprotected lower layers have been figured out by security researchers over the years, and as one of the 6G key values is in security and trustworthiness, it would be imperative to ensure protection of also the lower layer control procedures such as MAC CEs

Mobile Network Technology Evolutions Beyond 2030

Orange

Telecommunications are poised for rapid innovation, driven by advancements in AI/ML, cloud computing, platforming, and quantum technologies. This wave of innovation promises significant benefits for individuals, businesses, and society, but also presents challenges related to environmental impact, sustainability, and trust. Global standards are crucial for modern telecommunications, especially as the industry begins to standardize "6G" mobile network technologies for 2030 and beyond. This document outlines Orange's perspective on the evolution of mobile networks from 2030 to 2040, with further insights on innovation and value creation in telecommunications to be shared later.

Open RAN and 6G Future Networks Development

6G Smart Networks and Services Industry Association (6G-IA)

The development of 6G networks presents opportunities to enhance wireless communication through open and disaggregated network architectures, particularly in Radio Access Networks (RAN). Open RAN, which involves disaggregating RAN components and using open interfaces and software virtualization, offers flexibility, scalability, and vendor-agnostic implementation. Benefits include optimized network functions, increased competition, and smoother transitions to 6G. However, challenges such as security risks, integration complexity, and managing multi-vendor components could limit large-scale interoperability. The document suggests establishing a common certification regime in Europe to address these challenges and support the transition to 6G.

IEEE HK6GWS 2024: IEEE Hong Kong 6G Wireless Summit 2024

IEEE ComSoc Portfolio Event

IEEE Hong Kong 6G Wireless Summit