MiFuture News

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

June 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

KT and Nokia agreed to collaborate on developing advanced Open RAN technology for 6G mobile communications

May, 13 2024 - Korean carrier KT has partnered with Finnish vendor Nokia to carry out research in the 6G field, Korean press reported.

The two companies agreed to collaborate on developing advanced Open RAN technology for 6G mobile communications and ultra-wideband wireless access technology using candidate frequencies for 6G.

Fast Communications - IDTechEx Explores 5G and 6G Telecoms

BOSTON, May 17, 2024 /PRNewswire/ -- As the hunger for high-speed internet and constant connection increases, so too does the developments of 5G and 6G networks. The technology that makes this possible is happening right down in the small area of the antenna within the device, and low-loss materials and alternative substrates can offer ways of maintaining a strong connection.

Physicists create optical component for 6G

MAY 16, 2024. A joint team of physicists from Skoltech, MIPT, and ITMO developed an optical component that helps manage the properties of a terahertz beam and split it into several channels. The new device can be used as a modulator and generator of terahertz vortex beams in medicine, 6G communications, and microscopy. The paper appears in the journal Advanced Optical Materials.

DOCOMO, NTT, NEC and Fujitsu Develop Top-level Sub-terahertz 6G Device Capable of Ultra-high-speed 100 Gbps Transmission

TOKYO and KAWASAKI, JAPAN, April 11, 2024 --- NTT DOCOMO, INC., NTT Corporation, NEC Corporation and Fujitsu Limited jointly announced today the development of a top-level1 wireless device capable of ultra-high-speed 100 Gbps transmissions in the 100 GHz and 300 GHz sub-terahertz bands.

New 6G Wireless Tech Is 500 Times Faster Than Average 5G Smartphones

02 May 2024 - Fifth-generation or '5G' connectivity for cellular technology has only been the standard for networks for around five years, but with 6G already on the horizon, developers are looking for ways to take full advantage of the next generation's expansive bandwidth.

Breakthrough 6G antenna could lead to high-speed communications and holograms

May 2, 2024 - Scientists build the world's first 6G antenna that, when fitted into devices, can transmit data at high speeds. A new programmable antenna could pave the way for a new generation of 6G devices, smart city-type applications and 3D holograms, scientists claim.

Beyond connectivity: The telecom landscape in the age of 6G

16 May 2024 - While most companies are still getting to grips with 5G technology, Sapan Agarwal from Frost & Sullivan explains why forward-looking companies should already be strategically preparing for the next big leap – 6G.

6g: The Next Technological Leap

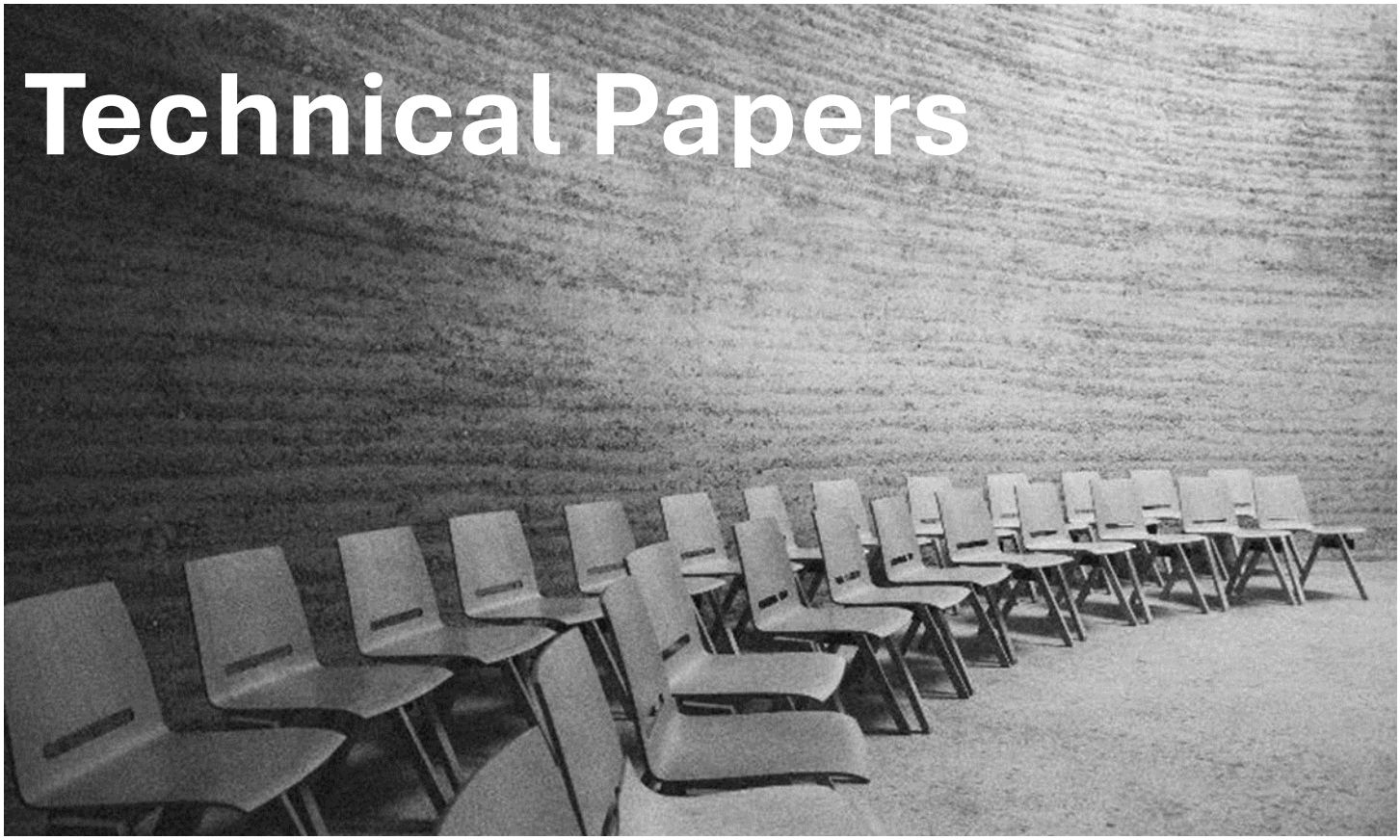
16/05/2024 - As 5G networks continue to expand worldwide, heralding new communication capabilities and services, attention is already turning to the next frontier: 6G. With the potential to revolutionize society, industries, and everyday life, 6G networks are poised to become the backbone of future communication needs, serving both humans and intelligent machines. To capitalize on this potential, collaboration between industry and research communities is crucial, with a shared vision driving advancements in critical services, immersive communication, and the omnipresent Internet of Things (IoT).

6G and a vision for sustainability

May, 6 2024 - While 5G networks are still being built, we are heavily engaged in studies and work on sustainable communications and the next generation of mobile and wireless networks (6G). Telenor has taken an active role in the development of all generations of mobile communication technologies.

China Mobile launches the world's first 6G test satellite

Feb. 05, 2024 - China Mobile, the world's largest telecom carrier by mobile subscribers, has successfully launched the world's first satellite to test 6G architecture, marking a milestone in its efforts to explore integrated space and ground communication technology.



SK Telecom 6G White Paper: 5G Lessons Learned, 6G Key Requirements, 6G Network Evolution, and 6G Spectrum

ICT Infra. SK Telecom

The standardization process for 6G has begun, with ITU-R's Framework Recommendation published in June 2023 and discussions on candidate frequencies starting at the end of the year. WP 5D will work on technical performance requirements from 2024. SKT's white paper outlines 6G key requirements, evolution methodology, and frequency trends. Key requirements include powerful services, simple architecture, expanded coverage, and reduced device power consumption. SKT projects megatrends like AI, power saving, and quantum security will shape 6G networks. Collaborating with global partners, SKT aims to lead 6G standardization, leveraging its 5G experience and partnerships with major telcos and IT companies.

Key Drivers and Research Challenges for 6G Ubiquitous Wireless Intelligence

Latva-aho, M. & Leppänen, K., (Eds.). (2019). Key Drivers and Research Challenges for 6G Ubiquitous Wireless Intelligence. 6G Research Visions, No. 1. University of Oulu.

The white paper “Key Drivers and Research Challenges for 6G Ubiquitous Wireless Intelligence” is based on the views that 70 invited experts shared during a special workshop at the first 6G Wireless Summit in Finnish Lapland in March 2019. The publication focuses on the key drivers, research requirements, challenges and research questions towards 6G.

The publication presents a strong vision of ubiquitous wireless intelligence for 2030. Ubiquitous services will follow users seamlessly, everywhere, and wireless connectivity will be part of critical infrastructure. Furthermore, intelligence will create context-aware smart services and applications for human and non-human users alike.

White Paper on 6G Drivers and the UN SDGs

This white paper has been written by an international expert group, led by the Finnish 6G Flagship program at the University of Oulu, within a series of twelve 6G white papers published in their final format in 2020.

The commercial launch of 6G systems and the UN's Sustainable Development Goals (SDGs) are both targeted for 2030. 6G is expected to boost growth, create new business models, and transform society. The UN SDGs address issues like poverty, gender equality, climate change, and smart cities. The relationship between 6G and the SDGs is currently under-defined. This white paper proposes a novel linkage via indicators, envisioning 6G's role as a service provider, data collection tool, and ecosystem reinforcer aligned with the SDGs. Challenges are identified, and an action plan with prioritized focus areas is presented to support the SDGs through 6G technology.

White paper on business of 6G

Yrjölä, S., Ahokangas, P., & Matinmikko-Blue, M. (Eds.). (2020). White Paper on Business of 6G. 6G Research Visions, No. 3. University of Oulu.

Developing future 6G products and services requires a multidisciplinary approach, redefining network resources and disrupting traditional business models. The 6G era will involve digital service operators, cloud operators, and resource brokers, requiring major changes for sustainable development. This white paper explores opportunities for stakeholders in the 6G ecosystem through novel, sustainable business models integrating long-tail services. Using a qualitative scenario planning method, it presents 12 scenarios—both optimistic and pessimistic—for 6G business futures, focusing on key trends and uncertainties. To capture value in 6G, attention to privacy, security, governance, user empowerment, and ecosystem configuration is essential.

6G white paper on validation and trials for verticals towards 2030's

Pouttu, A. (Ed.). (2020). 6G White Paper on Validation and Trials for Verticals towards 2030's. 6G Research Visions, No. 4. University of Oulu.

This white paper explores productivity enhancements across various business verticals with B5G/6G wireless services, highlighting benefits for mobile and flexible use cases. While fiber optic remains viable, wireless is cost-effective in some scenarios, such as retrofitting. Seven verticals with high revenue potential are discussed: industry 4.0, future mobility, eHealth, energy, finance and banking, public safety, and agribusiness. The paper examines drivers, expected changes, and the need for 6G capabilities, providing key performance and value indicators. It proposes guidelines for trialing and validation within verticals and identifies critical research questions to develop vertical-specific solutions by 2030.

6G: The Next Horizon White Paper

Huawei Tech

Wireless communication turned its first page in the early 1900s when Marconi transmitted the radio signal across the Atlantic. Since the 1980s, mobile communication has revolutionized the world, transforming every aspect of our lives.

With the endless frontiers spanning 5G, we start wondering what 6G will be like. 6G — a more advanced next-generation mobile communication system — will go far beyond just communications. It will serve as a distributed neural network that provides links with integrated communication, sensing, and computing capabilities to fuse the physical, biological, and cyber worlds, ushering in an era of true Intelligence of Everything. Building upon 5G, 6G will continue the transformation from connected people and things to connected intelligence. In essence, it will bring intelligence to every person, home, and business, leading to a new horizon of innovations. In this paper, we present a holistic view of our 6G vision, exploring 6G key capabilities, new use cases and requirements, new building blocks, and paradigm shifts in air interface and network architecture designs.

Terahertz Sensing and Communication Towards Future Intelligence Connected Networks

Guangjian Wang, Huanhuan Gu, Xianjin Li, Ziming Yu, Oupeng Li, Qiao Liu, Kun Zeng, Jia He, Yan Chen, Jianmin Lu,

Wen Tong, David Wessel. Wireless Technology Lab, Ottawa Wireless Advanced System Competency Centre

Huawei Tech

This paper examines the latest progress on spectrum and potential application scenarios for the THz band. A hybrid channel modeling framework for the THz band is proposed to improve modeling accuracy and efficiency.

6G – Connecting a cyber-physical world

Ericsson

5G is expanding globally, transforming society with new communication capabilities. The next phase, 5G Advanced, enhances mobile broadband, low latency communication, and machine communication. However, by 2030, new needs will surpass 5G's capabilities, necessitating 6G development. Future networks will be integral to life, society, and industry, supporting both humans and intelligent machines. Key drivers for 6G include system trustworthiness, sustainability, automation, digitalization, and limitless connectivity. 6G must exceed 5G's limits, focusing on critical services, immersive communication, and omnipresent IoT, integrating new capabilities like compute services and spatial data. This white paper outlines a 6G vision for 2030 and necessary technologies.

Events

WEBINAR 31.5.2024

BF DIGITALKS: 6G SYMPOSIUM SPRING 2024 HIGHLIGHTS & TAKEAWAYS

Time: Friday 31.5.2024 at 13:00-14:00
Place: Microsoft Teams

IEEE International Conference on Communications

June 9-13, 2024 | Denver, CO | In-Person Event

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

IEEE ComSoc Portfolio Event

IEEE Hong Kong 6G Wireless Summit

6GNet

3rd Edition of the International Conference on 6G Networking

October 21-24, 2024
Paris, France

IEEE IEEE ComSoc IEEE Communications Society IEEE France Section 6G FLAGSHIP UNIVERSITY OF OULU