Kadir Has University Wireless Communications Research Group and its Membership to International Organizations

Fall 2021

KADİR HAS UNIVERSITY

Kadir Has University
Wireless Communications
Research Group

Kadir Has University Telecommunications Research group consists of:

- Prof. Dr. Erdal Panayırcı, IEEE Life Fellow
- Prof. Dr. Serhat Erküçük, IEEE Senior Member
- Asst. Prof. Dr. Yalçın Şadi, IEEE Member
- Asst. Prof. Dr. Tunçer Baykaş IEEE Senior Member

Vision and Objectives

Our vision is to perform cutting edge research and innovation to go beyond the capabilities of the envisioned next generation mobile communications and become a leading institution in 6G studies using our expertise in wireless communications design. Our main strategic objectives are participating in the flagship EU projects and contributing to the standardization efforts towards 6G.

Our Expertise

Kadir Has University (KHAS), founded in 1997, is one of the leading mid-size universities in Turkey with 6000 undergraduate, 1000 Master's and PhD students, and more than 400 researchers. With an exceptional academic staff and a wide range of educational opportunities, as well as high levels of cooperation, interaction, and research capabilities coupled with strong international connections and a dedication to development, KHAS attracts new researchers both from Europe and close region. KHAS has significant experience in the management and delivery of EU-funded projects (21 successful

partnerships and 8 coordinator roles among 49 project applications until now, mostly in Framework Programs). As the **KHAS Wireless Communications Research Group**, we aim at performing beyond the state of the art in next generation communications with a particular focus, but not limited to, on:

• Communication System Design for 5G and beyond
• Machine-to-Machine Communications
• Visible Light Communications
• Cyber-Physical Systems and Wireless Networked Control Systems
• Wireless Powered Communication Networks
• Spectrum Management

Current Projects

- EU COST action "Opticwise"
- Tübitak 1003 Programme, "PHY Layer Security for Visible Light Communications"
- Tübitak 2244 Programme, "Development of Next Generation WiFi Networks"
- Tübitak 3501 Programme, "Radio Resource Allocation in 5G and Beyond Cellular Networks for M2M Communications"
- Tübitak 1001 Programme, "Sparse Code Multiple Access with Time and Frequency Spreading for Next Generation Systems"

Note: We are seeking to fill gradute student researcher spots in our current projects. If you are interested you can reach us via wcrg@khas.edu.tr.

Memberships to International Organizations

As Kadir Has University, we are members of 4 international standardization organizations. These organizaitons will be explained in detail:

- International Telecommunication Union
- 5G Industry Association
- *6G Flagship*
- *IEEE 802 Lan/Man Standard Committe*
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International Telecommunication Union

The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies – ICTs.

Founded in 1865 to facilitate international connectivity in communications networks, we allocate global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to ICTs to underserved communities worldwide. ITU has three main areas of activity organized in 'Sectors' which work through conferences and meetings.

RADIOCOMMUNICATIONS (ITU-R)
ITU's Radiocommunication Sector coordinates the radiocommunication services and manages the international use of radio-frequency spectrum and satellite orbits.

STANDARDIZATION (ITU-T)
The Study Groups of ITU's Telecommunication Standardization Sector (ITU-T) develops international standards known as ITU-T Recommendations which act as defining elements in the infrastructure of information and communication technologies (ICTs).

DEVELOPMENT (ITU-D)
The Telecommunication Development Sector (ITU-D) works to close the digital divide and drive digital transformation to leverage the power of ICTs for economic prosperity, job creation, digital skills development, gender equality, diversity, a sustainable and circular economy, and for saving lives. Its work prioritizes those most in need- from people living in the world's Least Developed Countries to marginalized communities everywhere.

KADIR HAS UNIVERSITY is the only academic member from TURKEY in ITU. Our research team contributed ITU-R in the areas of THz and Light Communications.

The 5G Public Private Partnership (5G PPP) is the 5G collaborative research program that is organized as part of the European Commission's Horizon 2020 program – The European Union Program for Research and Innovation. It is aimed at fostering industry-driven research, monitored by business-related, technological performance and societal KPIs. The 5G PPP will deliver solutions, architectures, technologies and standards for next-generation communication infrastructure over the coming decade.

In the 5G PPP, the 5G IA represents the private side and the European Commission the public side. The 5G IA is committed to the advancement of 5G in Europe and to building global consensus on 5G. To this aim, the Association brings together a global industry community of telecoms & digital actors, such as operators, manufacturers, research institutes, universities, verticals, SMEs and ICT associations. The 5G IA carries out a wide range of activities in strategic areas including standardization, frequency spectrum, R&D projects, technology skills, collaboration with key vertical industry sectors, notably for the development of trials, and international cooperation.

5G IA WORKING GROUPS	
Open Smart Networks and Services WG	Pre-Standardization WG
Spectrum WG	Vision and Societal Challenges WG
Security WG	Trials WG
IMT-2020 Evaluation Group	5G Architecture WG
Software Networks WG	Network Management & QoS WG
5G for CAM WG	SME WG
Test, Measurement and KPIs Validation	

KADIR HAS UNIVERSITY will become a member of 5G IA in October 2021. We are ready to collaborate with current and future members of 5G IA.

6G FLAGSHIP

6G Flagship is a 6G research, development, and innovation ecosystem coordinated by the University of Oulu. In 2019-2021, 6G Flagship published the world's first 6G White Papers.

The overarching goals of 6G Flagship are:
1. Support industry in finalization of 5G.
2. Develop the fundamental technology needed to enable 6G..
3. Speed up digitalization in society.

Research in 6G Flagship is organised into four interrelated strategic research areas where scientific breakthroughs are sought in the development of fundamental technology components for 6G systems.

- Wireless Connectivity
- Devices and Circuit Technology
- Distirbuted Computing
- Services and Applications

At Kadir Has University, so far we contributed 3 white papers of 6G Flagship '**White paper on broadband connectivity in 6G**', '**6G white paper: Research challenges for trust, security and privacy**', and '**White paper on Critical and Massive Machine Type Communications towards 6G**'.

KADIR HAS UNIVERSITY team is joining 6G Flagship meetings and continue working to develop new technologies with our partners.

IEEE LAN/MAN
STANDARDS COMMITTEE

The IEEE 802 LAN/MAN Standards Committee develops and maintains networking standards and recommended practices for local, metropolitan, and other area networks, using an open and accredited process, and advocates them on a global basis. The most widely used standards are for Ethernet, Bridging and Virtual Bridged LANs, Wireless LAN (WiFi), Wireless PAN (Zigbee), Wireless MAN, Wireless Coexistence, Media Independent Handover Services, and Wireless RAN. An individual Working Group provides the focus for each area.

IEEE 802 Working Groups and Study Groups
- 802.1 Higher Layer LAN Protocols Working Group
- 802.3 Ethernet Working Group
- 802.11 Wireless LAN Working Group (WiFi)
- 802.15 Wireless Specialty Networks Working Group (Zigbee, WiSun)
- 802.18 Radio Regulatory TAG
- 802.19 Wireless Coexistence Working Group
- 802.24 Vertical Applications TAG

At Kadir Has University, we are conducting projects on the next generation WiFi and Light Communication systems. We also follow newly starting TeraHertz standards, Sensing standards and Security standards.

Prof. Baykaş, a member of the KADIR HAS UNIVERSITY team, is part of the IEEE 802 Executive Committee and provides assistance to companies, joining IEEE 802 standard development.

For more information, you can reach our group at:
wcrg@khas.edu.tr