

Lecture by

Konstantinos E. Psannis

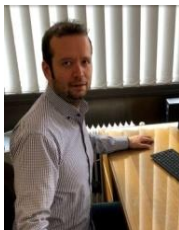
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6G-Enabled Massive Internet of Things

Abstract:

As 5G wireless communication technology becomes a reality in terms of performance and implementation, the transition to 6G wireless technology emerges as a necessity to face the state-of-the-art issues and limitations of current 5G systems. Massive MIMO is already providing high data rates along with spectral and energy efficiency. High multiplexing gain and beamforming capabilities also set the stage for optimal performance. IoT technology involves the dense deployment of smart sensing units that provide information in an accurate and timely manner. With the integration of Massive MIMO technology, the 6G Massive IoT introduces new challenges both from the 6G perspective such as higher frequency zone exploitation and high data rate performance as well as IoT design challenges such as latency, coverage and localization. Numerous technologies have been utilized to face the emerging issues of such massively deployed networks, such as artificial intelligence, machine learning, deep learning as well as Compressed Sensing. Compressed Sensing provides optimized performance achieving the two fold benefits of computational and implementation complexity reduction. This is realized by efficient information processing and hardware simplification. Joint consideration of the issues of efficient sensing, communication, storing and information processing could render 6G Massive IoT networks the promising technology in future communications.



About the author

KONSTANTINOS E. PSANNIS was born and raised in Thessaloniki, Greece. He is currently Associate Professor in Communications Systems and Networking at the Department of Applied Informatics, School of Information Sciences, University of Macedonia, Greece, Director of Mobility2net Research & Development & Consulting JP-EU Lab, member of the EU-JAPAN Centre for Industrial Cooperation and Visiting Consultant Professor, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya 466-8555, Japan. Konstantinos received a degree in Physics, Faculty of Sciences, from Aristotle University of Thessaloniki, Greece, and the Ph.D. degree from the School of Engineering and Design, Department of Electronic and Computer Engineering of Brunel University, London, UK. From 2001 to 2002 he was awarded the British Chevening scholarship. The Chevening Scholarships are the UK government's global scholarship programme, funded by the Foreign and Commonwealth Office (FCO) and partner organisations. The programme makes awards to outstanding scholars with leadership potential from around the world to study at universities in the UK.

Dr. Psannis' research spans a wide range of Digital Media Communications, media coding/synchronization and transport over a variety of networks, both from the theoretical as well as the practical points of view. His recent work has been directed toward the demanding digital signals and systems problems arising from the various areas of ubiquitous Big Data/AI-IoT/Clouds and communications. This work is supported by research grants and contracts



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from various government organisations.. Dr. Psannis has participated in joint research works funded by Grant-in-Aid for Scientific Research, Japan Society for the Promotion of Science (JSPS), KAKENHI Grant, The Telecommunications Advancement Foundation, International Information Science Foundation, as a Principal Investigator and Visiting Consultant Professor in Nagoya Institute of Technology, Japan. Konstantinos E. Psannis was invited to speak on the EU-Japan Co-ordinated Call Preparatory meeting, Green & Content Centric Networking (CCN), organized by European Commission (EC) and National Institute of Information and Communications Technology (NICT)/Ministry of Internal Affairs and Communications (MIC), Japan (in the context of the upcoming ICT Work Programme 2013) and International Telecommunication Union. (ITU-founded in 1865), SG13 meeting on DAN/CCN, Berlin, July 2012, amongst other invited speakers. Konstantinos received a joint-research Award from the Institute of Electronics, Information and Communication Engineers, Japan, Technical Committee on Communication Quality, July 2009 and joint-research Encouraging Prize from the IEICE Technical Committee on Communication Systems (CS), July 2011. Dr. Psannis has more than 70 publications in international scientific journals and more than 100 publications in international conferences, 20 Book Chapters and 11 Technical Reports and received more than 3800 citations (h-index 27, i10-index 56). Professor Konstantinos has several highly cited papers powered by Web of Science - Clarivate.

Dr. Psannis supervises three post-doc students and eight PhD students. Prof. Konstantinos E. Psannis is serving as an Associate Editor for IEEE Access and IEEE Communications Letters. He is Lead Associate Editor for the Special Issue on Roadmap to 5G: rising to the challenge, IEEE Access, 2019. He is a Guest Editor for the Special Issue on Compressive Sensing-Based IoT Applications, Sensors, 2020. He is a Guest Editor for the Special Issue on Advances in Baseband Signal Processing, Circuit Designs, and Communications, Information, 2020. He is a Lead Guest Editor for the Special Issue on Artificial Intelligence for Cloud Based Big Data Analytics, Big Data Research, 2020. He is TPC Co-Chair at the International Conference on Computer Communications and the Internet (ICCCI 2020), Nagoya Institute of Technology Japan, ICCCI 2020, June 26-29 at Nagoya, Japan, and will be held in 2021 June 25-27, at Nagoya, [<http://iccci.org/>] and Conference Chair at the World Symposium on Communications Engineering held at University of Macedonia, Thessaloniki, Greece, October 9-11, 2020 and to be held at University of Macedonia, November 25-28, 2021, Thessaloniki, Greece (WSCE 2021 - <http://wsce.org/>). Professor Konstantinos E. Psannis has been included in the list of Top 2% influential researchers globally (prepared by Scientists from Stanford University USA), October 2020 (<https://lnkd.in/dhSwdgB>) and October 2021 (<https://lnkd.in/gCk8FAxu>).

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