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IEEE Galveston Bay Section

Joint Technical Societies Chapters

Present

**"COMSOC WEEK"**

**with special Webinars**

**on**

**THURSDAY-September 15th, and SATURDAY- September 17th**

**THURSDAY-September 15th, 11:00 AM US-Central**

**TOPIC : " Wireless Nano-Bio Communication Networks enabled by Optogenomic Interfaces"**

**SPEAKER: Josep Miquel Jornet, Ph.D., Northestern University, Boston, ComSoc Distinguished Speaker**

**PRESENTATION:**

Major breakthroughs in the field of biophotonics, genomics and stem cell biology are enabling the control of

biological processes through light. By incorporating light-actuated and light-emitting proteins into cells, key

biological processes at the single-cell level can be controlled in real time. In parallel to such developments,

nanotechnology is providing the engineering community with a new set of tools to create novel nanoscale

devices with unprecedented functionalities. These include, among others, plasmonic nano-lasers with sub-

micrometric footprint, plasmonic nano-antennas able to confine light in nanometric structures, or single-

photon detectors with unrivaled sensitivity, which can be combined to create novel optical nano-sensors and

nano-actuators. Together, networks of nano-actuators and nano-sensors can control and monitor biological

processes at the sub-cellular level with unprecedented temporal and spatial accuracy. The resulting light-

mediated nano-bio-interfaces enable new unique applications, ranging from new tools to study, understand

and enhance the recovery from developmental and neurodegenerative diseases to novel brain machine

interfaces and other technologies targeted at enriching human-machine interaction. In this talk, the

fundamentals and the experimental state of the art and future research directions for wireless nano-bio

communication networks enabled by optogenomics will be presented. Optogenomic interfaces are light-

mediated nano-bio-interfaces that allow the control and monitoring of the genome and, thus, of all the cell

functionalities, with (sub) cellular resolution and high temporal accuracy. The biological principles of cell

development and function and, in particular, the role of the FGFR1 gene will be described. Then, the state-

of-the-art in optical nano-devices will be summarized. Experimental results demonstrating the feasibility to

optically actuate the expression of FGFR1 and, thus, the genome, will be presented. Future steps towards

moving fundamental in-vitro lab to in-vivo testing and, ultimately, deployment in humans, will be discussed

while highlighting the role of wireless communication engineers in this truly transformative research

paradigm.

**PRESENTER:**

Josep M. Jornet is an Associate Professor in the Department of Electrical and Computer Engineering, the

Director of the Ultrabroadband Nanonetworking Laboratory and a faculty member of the Institute for the

Wireless Internet of Things and the SMART Center at Northeastern University, in Boston, MA. He received

the B.S. in Telecommunication Engineering and the M.Sc. in Information and Communication Technologies

from the Universitat Politecnica de Catalunya, Barcelona, Spain, in 2008. He received the Ph.D. degree in

Electrical and Computer Engineering from the Georgia Institute of Technology, Atlanta, GA, in 2013. His

research interests are in Terahertz-band communication networks, Wireless Nano-bio-communication

Networks and the Internet of Nano-Things. In these areas, he has co-authored more than 200 peer-reviewed

scientific publications, 1 book, and has also been granted 5 US patents, which accumulate over 12,800

citations (h-index of 52) as of August 2022. He is serving as the lead PI on multiple grants from U.S. federal

agencies including the National Science Foundation, the Air Force Office of Scientific Research and the Air

Force Research Laboratory. He is a recipient of the National Science Foundation CAREER award and of

several other awards from IEEE, ACM, UB and NU. He is a Senior Member of the IEEE, a member of the

ACM, and an IEEE ComSoc Distinguished Lecturer (class of 2022-2023). He is serving as a Vice Chair of

IEEE ComSoc RCC SIG on THz Communications, and as an Editor for IEEE Transactions on

Communications. He is also the Editor-in-Chief of Elsevier Nano Communication Networks Journal, and

serves in the Steering Committee of the ACM Conference Series on Nanoscale Computing and

Communications. Email: jmjornet@northeastern.edu, Webpage: https://www.unlab.tech

**Complimentary Registration on VTool:**

https:// Events.vtools.ieee.org/event/register/323531

**Deadline: September 14th, 5:00 PM US-Central**

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**SATURDAY, September 17th, 11:00 AM US-Central**

## **TOPIC: “Cognitive Approach to Building a Safe and Smart Cities/Societies”**

**SPEAKER: Fawzi Behmann,** DL, MBA, M. Comp. Sc., Author and Lecturer

President, TelNet Management Consulting Inc., IEEE ComSoc NA Regional Director

**PRESENTATION:**

Layers of smartness—using technology and data—are being built into cities to make them safer,

more efficient and sustainable. Developed cities around the world are actively launching smart

solutions, while new and emerging cities are integrating intelligent, connected systems from the

start. The big cities of today may not be those of tomorrow. The opportunities are

immense—across infrastructure, mobility, energy, healthcare and beyond. Innovative technology

applications and their adoption in society offer a turning point. At its core, the smart city is about

people and improving the quality of our everyday lives. The COVID-19 pandemic has revealed

some of the shortcomings of major cities in times of crisis.

The talk will cover the following areas:

**Intro:** Current state and challenges of Smart Cities

\*\*Disruptive technologies enable building solid foundation for smart cities - highlights of

current and future of IoT, 5G/6G, Analytics (AI/ML/DP) across key markets

\*\*Key examples – technology convergence &amp; adoption in new use cases in key verticals such

as smart homes, public safety, autonomous driving, healthcare, smart energy and others.

\*\* Covid-19 accelerate return to new norm with greater innovation, and end-to-end services

Conclusion: Adoption of disruptive technologies and acceleration to a new norm that will help

transition to smart societies.

**Key Takeaways**

• Understanding the mission of smart cities and current situation of 50 worldwide top smart

cities and impact from Coronavirus Covid-19

• Technology Features overview and roadmap of 4G/5G/6G, IoT and AI

• Sample use cases and power of virtualization and network slicing

**PRESENTER:**

Fawzi is currently the founder and president of TelNet Management Consulting Inc. offering international

professional services in the areas of technology trends; positioning and building smart networking ecosystem

solutions in key markets. Prior, Fawzi held various executive and leadership positions with Tier 1 companies in

the areas of communications and networking in Canada and US. He championed the development of Telecom

Network Management systems, led efforts in rolling out product releases for network edge and core and

marketing SoC product line and roadmap.

Fawzi has been a keynote speaker and distinguished lecturer at several domestic and international conferences and

events. He has several publications and co-authored book on Collaborative Internet of Things for Future Smart

Connected Life and Business, published by Wiley. He is a voting member of IEEE Conference Committee (2022-2023),

Co-Chair IEEE SA Transdisciplinary Framework working groups and contributor to IEEE Future Direction Initiatives.

He is IEEE ComSoc Regional Director for North America and BoG member (2020-2021, 2022-2023). and chair of

multiple society chapters (ComSoc, Signal Processing, Computer, EMB, CTSoc).

Fawzi engaged with international forums and successfully organized international conferences since 2010. He has

been the general chair of WCNC 2022 hybrid conference “Boosting Verticals in Wireless Orbit”, and has organized

several events such as smart city summit (2019), Blockchain for Healthcare (2018) and Greentech of Smart Cities

(2018), Advanced technologies in Healthcare (2017) and others. In addition, he has been Industry Forum and

exhibit chair, panel/session chair, marketing & publicity chair as well as local arrangement chair at many conferences

such as Globecom, ICC, WCNC, WFIoT, Future Networks (WF5G), ICCE, Himss, BHI, Smart connected cities, CABA,

Enterprise IoT, and others. He has been honored with several awards from Industry and IEEE. Freescale CEO Diamond

Chip Award in 2008, and IEEE Communications Society Chapter Achievement and Chapter of the year awards in 2015

and 2017, Region 5 Outstanding Member award for 2013, 2014 and 2015. Most recently, Fawzi received IEEE-USA

Regional Professional Leadership Award in 2018 and Outstanding Large section and Section Visionary chair for 2018-2019.

Fawzi holds a Bachelor of Science with honors and distinction from Concordia University, Montreal; Masters in

Computer Science from the University of Waterloo, Ontario and Executive MBA from Queen’s University, Ontario Canada.

**Complimentary Registration on VTools**

https:// https:// https://events.vtools.ieee.org/event/register/323532

**Deadline: Friday September 16th , 5:00 PM US-Central**

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GBS "Societies WEEK" Coordinator:

Dr Zafar Taqvi, Chair GBS Joint Societies Chapter, University of Houston Clear Lake

GBS Website //r5.ieee.org/gb