**Avviso di Seminario**

**Webinar**

**Martedì 1 Ottobre 2021, ore 15:00 (Italy Time)**

**Dr. Vahid Jamali**

**Princeton University**

**“Redefining the Wireless Communication Channel via Intelligent Reflecting Surfaces”**

**Abstract:**

Smart wireless environments are a newly emerging concept in wireless communications where intelligent reflecting surfaces (IRSs) are deployed to influence the propagation characteristics of the wireless channel. IRSs consist of a large number of programmable sub-wavelength elements, so-called unit cells or meta atoms, that can change the properties of an impinging electromagnetic wave while reflecting it. For instance, a properly designed unit cell phase distribution across the surface enables the IRS to alter the direction of the wavefront of the reflected wave, thereby realizing the generalized Snell’s law and creating a virtual path between the transmitter and the receiver.

This seminar presents a tutorial-style introduction to IRS-assisted communications. We will review the basics of IRS technologies, the modeling and optimization of IRSs, state-of-the-art research results, and important open research problems for future works. In addition, we consider two recent technical contributions in this field, namely one on microwave band and the other on optical band, and further discuss the mathematical tools that are employed in these contributions for the IRS design and analysis. The target audience of this seminar are graduate and doctoral students with basic knowledge of communication systems.

**Vahid Jamali** (Member, IEEE) received the B.Sc. and M.Sc. degrees (Hons.) in electrical engineering from the K. N. Toosi University of Technology, Tehran, Iran, in 2010 and 2012, respectively, and the Ph.D. degree (Hons.) from the Friedrich-Alexander-University (FAU) of Erlangen-Nürnberg, Erlangen, Germany, in 2019. In 2017, he was a Visiting Research Scholar with Stanford University, CA, USA.

He is currently a Post-Doctoral Research Fellow at the Department of Electrical and Computer Engineering, Princeton University.

His research interests include wireless and molecular communications and multiuser information theory. He has served as a member of the Technical Program Committee for several IEEE conferences. He received several awards for his publications and research work, including the Best Paper Award from the IEEE International Conference on Communications in 2016, the Doctoral Research Grant from the German Academic Exchange Service (DAAD) in 2017, the Goldener Igel Publication Award from the Telecommunications Laboratory (LNT), FAU, in 2018, the Best Ph.D. Thesis Presentation Award from the IEEE Wireless Communications and Networking Conference in 2018, the Best Paper Award (co-recipient) from the ACM International Conference on Nanoscale Computing and Communication in 2019, the Best Journal Paper Award (Literaturpreis) from the German Information Technology Society (ITG) in 2020, and the Postdoctoral Research Fellowship by the German Research Foundation (DFG) in 2020. He is currently an Associate Editor of the IEEE Communications Letters and IEEE Open Journal of the Communications Society.

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