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香港中文大學
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Institute of Theoretical Computer Science and Communications

IE-ITCSC Seminar

An Information Theoretic Perspective of Fronthaul Constrained Cloud and Fog Radio Access Networks

By

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31 October 2017, Tuesday

2:30 pm – 3:30 pm

Room 713, 7/F, William MW Mong Engineering Building, CUHK

Abstract:

Cloud radio access networks (C-RANs) emerge as appealing architectures for next-generation wireless/cellular systems whereby the processing/decoding is migrated from the local base-stations/radio units (RUs) to a control/central units (CU) in the "cloud". Fog radio access networks (F-RAN) address the case where the RUs are enhanced by having the ability of local caching of popular contents. The network operates via fronthaul digital links connecting the CU and the RUs. In this talk we will address basic information theoretic aspects of such networks, with emphasis of simple oblivious processing. Theoretical results illustrate the considerable performance gains to be expected for different cellular models. Some interesting theoretical directions conclude the presentation.

Joint work with S.-H. Park, O. Simeone, and O. Sahin.
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Biography:

Prof Shlomo Shamai Shitz received the B.Sc., M.Sc., and Ph.D. degrees in electrical engineering from the Technion—Israel Institute of Technology, in 1975, 1981 and 1986 respectively.

During 1975-1985 he was with the Communications Research Labs in the capacity of a Senior Research Engineer. Since 1986 he is with the Department of Electrical Engineering, Technion-Israel Institute of Technology, where he is now a Technion Distinguished Professor, and holds the William Fondiller Chair of Telecommunications.

Prof. Shamai is an IEEE Fellow, a Member of the Israeli Academy of Sciences and Humanities and a Foreign Member of the US National Academy of Engineering. He is the recepient of the 2011 Claude E. Shannon Award, the 2014 Rothschild Prize in Mathematics/Computer Sciences and Engineering and the 2017 IEEE Richard W. Hamming Medal.

His research work encompasses a wide spectrum of topics in information theory and statistical communications to which he has contributed fundamentally. Some highlights of his scientific work comprise: Conclusive results on the capacity of the multi-input-multi-output broadcast Channels; Establishing basic connections between information theory and statistical estimation theory; Introducing pioneering concepts of interference alignment for communications networks and currently providing a unified information theoretic framework of cloud and fog radio access networks.

He has been awarded the 1999 van der Pol Gold Medal of the Union Radio Scientifique Internationale (URSI), and is a co-recipient of the 2000 IEEE Donald G. Fink Prize Paper Award, the 2003, and the 2004 joint IT/COM societies paper award, the 2007 IEEE Information Theory Society Paper Award, the 2009 and 2015 European Commission FP7, Network of Excellence in Wireless COMmunications Best Paper Awards, the 2010 Thomson Reuters Award for International Excellence in Scientific Research, the 2014 Europian Association for Signal Processing (EURASIP) Best Paper Award, and the 2015 IEEE Communications Society Best Tutorial Paper Award. He is a Highly Cited researcher and is listed in the 2015 Thomson Reuters "The World's Most Influential Scientific Minds". He is also the recipient of 1985 Alon Grant for distinguished young scientists and the 2000 Technion Henry Taub Prize for Excellence in Research. He has served as Associate Editor for the Shannon Theory of the IEEE Transactions on Information Theory, and twice on the Board of Governors of the Information Theory Society. He has also served on the Executive Editorial Board of the IEEE Transactions on Information Theory and on the IEEE Information Theory Society Nominations and Appointments Committee.

******* ALL ARE WELCOME *******

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