上海交通大学自动化系
Department of Automation
Shanghai Jiao Tong University

系统控制与信息处理教育部重点实验室
Key Laboratory of System Control and Information Processing, Ministry of Education

# 学术报告会

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**地点：电院群楼3-208会议室**

## Comprehensive State Inference for Wireless Cognitive Networks


**Prof. Georgios B. Giannakis**

**University of Minnesota, USA**



**Abstract:**

Sensing is a critical prerequisite in envisioned applications of wireless cognitive radio (CR) networks, which promise to resolve the perceived bandwidth scarcity versus under-utilization dilemma. This talk presents recent advances for comprehensive situation awareness at the PHY and higher-layers of CR networks. PHY-layer sensing capitalizes on the novel notion of spatio-temporal RF cartography, which amounts to constructing two families of maps: (m1) global power spectral density maps capturing the distribution of power across space, time, and frequency; and (m2) channel gain maps providing the propagation medium per frequency from each node to any point in space and time. Higher-layer sensing aims to comprehensively yet concisely capture key state variables which in addition to interference and any-to-any link gains include band occupancies, queue lengths, path delays, and possible anomalies. The vision is to construct a compendious cognition infrastructure so as to maximize overall network performance and end-user satisfaction, notwithstanding the significant challenges associated with the CR spectrum access paradigm, as well as the incomplete, corrupt and sporadic data.


**Biography:**

**Prof. G. B. Giannakis** (IEEE Fellow'97) received his Diploma in Electrical Engr. from the Ntl. Tech. Univ. of Athens, Greece. From 1982 to 1986 he was with the Univ. of Southern California (USC), where he received his MSc. in Electrical Engineering and MSc. in Mathematics, and Ph.D. in Electrical Engr. Since 1999 he has been a professor with the Univ. of Minnesota, where he now holds an ADC Chair in Wireless Telecommunications in the ECE Department, and serves as director of the Digital Technology Center. His general interests span the areas of communications, networking and statistical signal processing â subjects on which he has published two edited books, two research monographs, 20 book chapters, 350 journal and 580 conference papers. Current research focuses on compressive sampling, cognitive radios, cross-layer designs, wireless sensors, social and power grid networks. He is the (co-) inventor of 21 patents issued, and the (co-) recipient of 8 best paper awards from the IEEE Signal Processing (SP) and Communications Societies, including the G. Marconi Prize Paper Award in Wireless Communications. He also received Technical Achievement Awards from the SP Society, from EURASIP, and the G. W. Taylor Award for Distinguished Research from the University of Minnesota. He is a Fellow of ÎÎÎÎ and EURASIP, and has served the IEEE in a number of posts, including that of a Distinguished Lecturer for the IEEE-SP Society.