

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

**DOTTORATO DI RICERCA / PhD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING**

Seminar announcement

Thursday 2 October 2025, Time: 10:00 - 11:00

**Room “Aula Riunioni (ex aula consiglio DIBET)”, Building 2, Ground Floor,
Via Claudio, 21 – NAPOLI**



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Estimations of Unimodular Signal Waveform and Uncertain Receive Signal Steering Vector for Robust Optimal Receive Beamforming Design

Abstract: A robust optimal receive beamforming (RORB) problem formulated in the worst-case signal-to-interference-plus-noise ratio (SINR) maximization is studied via estimations of the unimodular signal waveform and the uncertain receive signal steering vector (SV). In the SINR formula, the denominator is calculated approximately by the power sum of signal samples (i.e., the array output signal minus the estimated desired signal). Thus, in the maximin SINR problem, the objective is the minimal SINR over the uncertainty set of the SV, and the outer maximization problem includes

variables of nonzero beamvector, unimodular waveform vector and complex amplitude of the desired signal. Thus, the maximin SINR problem is recast into a quadratic matrix inequality problem, and an alternating optimization (AO) method is proposed to tackle. When updating any one variable in AO procedure, an optimal solution can be always secured theoretically or obtained numerically. Simulation shows that the proposed beamformer leads to better array performance than an existing two-stage RORB solution in terms of the output SINR, normalized beampattern and computational cost.

Lecturer short bio: *Dr. Huang received the Ph.D. degree in Systems Engineering and Engineering Management from the Chinese University of Hong Kong in 2005. He currently is a Dazhi Professor of Information Engineering with the School of Computer Science and Engineering, Guangdong Polytechnic Normal University, Guangzhou, China. From July 2016 to June 2025, he was a Full Professor with the School of Information Engineering, Guangdong University of Technology in Guangzhou. Prior to the two positions in Mainland China, he held a faculty position with Hong Kong Baptist University, and several research appointments, namely, with the Hong Kong University of Science and Technology, the Chinese University of Hong Kong, and the University of Naples "Federico II," Naples, Italy. His research interests include: Signal processing for wireless communications, signal processing for integrated sensing and communications, array signal processing and beamforming, radar signal processing, robust designs for signal processing systems, and optimization analysis and algorithms.*

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