

Robust Secrecy Rate Maximization for MISO WIPT System with Transmit TS Scheme

Date: Tue. 12th Dec.

Time: 1:10 pm

Location: Building 59, Room 2013

Speaker:

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Abstract:

Recent research is advancing to achieve the transfer of information and energy over the same wireless channel. However, due to the requirement of high received power levels in order to ensure meaningful wireless power transfer, the physical layer is becoming more vulnerable to cyber attacks by potential multi-antenna eavesdroppers. To address this issue, this paper considers transmit time-switching (TS) mode, in which energy and information signals are transmitted separately in time by the BS. This protocol is not only easy to implement but also delivers the opportunity of multi-purpose beamforming, in which energy beamformers during wireless power transfer are useful in jamming the eavesdropper. In the presence of imperfect channel estimation and multi-antenna eavesdroppers, the energy and information beamformers and the transmit TS ratio are jointly optimized to maximize the worst-case user secrecy rate subject to UEs' harvested energy thresholds and a BS transmit power budget. New robust path-following algorithms, which involve one simple convex quadratic program at each iteration are proposed for computational solutions of such difficult optimization problem. Numerical results confirm that the performance of the proposed computational solution is robust against the channel uncertainties.