National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: A Collaborative Decision based Approach with PU's Random Arrivals for an Energy-Harvesting UAV-CR Network
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Venue	: Seminar Room (EE-205)
Date and Time	: 28 Oct 2024 (5:15 PM)
Abstract	:

Abstract: The performance of unmanned aerial vehicle (UAV) assisted communication is gaining significant attention in the fifth-generation (5G), and upcoming sixth-generation (6G) network for potential wireless services and improved outdoor link throughput as UAVs are less affected by fading and shadowing effects. In this paper, a UAV-assisted energy harvesting-based cognitive radio network (CRN) model is demonstrated to investigate sensing performance, network throughput, and energy efficiency. The UAV is equipped with a CR-enabled energy harvester that harvests RF energy from PU's signal. A collaborative decision-based energy detection approach is proposed to improve the sensing decisions and network throughput, ensuring PU's quality of service (QoS). A PU's state transition model with UAV's possible data transmission cases is proposed to achieve high throughput. The analytical expression for energy harvesting, sensing performance, network throughput, and energy efficiency are also derived. Moreover, an objective function is formulated for energy efficiency, and the sensing angle is optimized to maximize the energy efficiency. Simulation results show the efficacy of the proposed approach in improving sensing decisions, network throughput, and energy efficiency over existing approaches, even in severe channel conditions.