

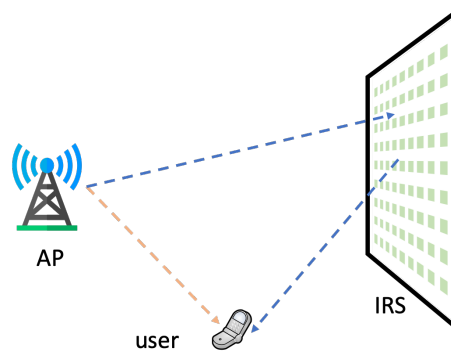
Intelligent Reflective Surfaces in Wireless Powered Communication Networks

Keywords

Intelligent Reflective Surface, Channel Interference, Wireless Power Transfer, Beamforming Design, Optimization.

Description

Intelligent reflective surface (IRS) is a novel enabling technology for managing radio signal propagation in both beyond 5G and 6G cellular wireless networks. IRS has shown a strong capability in enhancing the wireless link qualities between access point (AP) and networked users. By accordingly tuning the phase shifts of the reflecting units (the grid blocks in the figure), IRS is able to reflect the signal from AP to the user as a constructive component (or a destructive component). By adding this component (blue one) to the direct transmission component (orange one), the finally resulting signal at user can be enhanced (or the undesired interference from AP can be suppressed). As a result, an improved communication quality can be obtained. The operation flexibility and low power cost have also made IRS rather attractive in deployments.



In IRS-aided wireless powered communication networks, the coexistence of wireless power transfer and wireless information transportation would expect a well-deployed IRS, as well as a well-designed beamforming scheme.

Goal

For the goal of this thesis, the student will be expected to learn about the concept of IRS, and under guidance to apply optimization strategy for an efficient beamforming design in IRS-aided wireless powered communication network. Numerical simulations will be expected to validate the proposed design.

Requirements

- Basic knowledge in wireless communications or optimization technologies
- MATLAB programming skills
- Self-motivated and work efficiently

Contact

Dr. Xiaopeng Yuan, Room 337 (ICT Cubes), E-mail: xiaopeng.yuan@inda.rwth-aachen.de