Fachgebiet Kommunikationstechnik
Jaime Luque, Prof. Anja Klein

Bachelor Thesis / Master Thesis / HiWi-Job

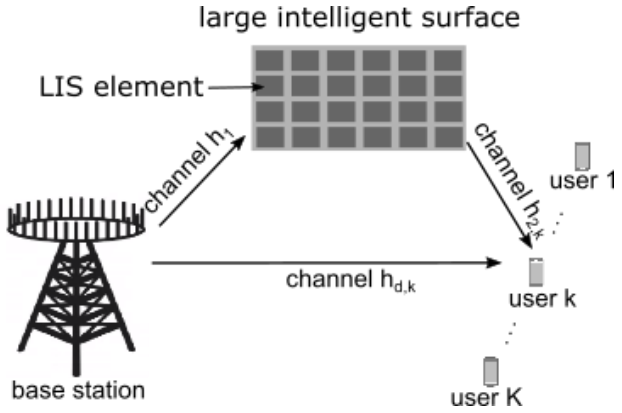
TECHNISCHE UNIVERSITÄT DARMSTADT

The 5G mobile communication standard aims to provide broadband, massive and ultra-reliable low-latency connectivity relying on different technologies for system performance including millimeter wave, massive MIMO (mMIMO) and cell densification. However, its practical realization comes with the price of high power consumption, hardware cost and processing complexity that compromise scalable deployments in future networks. Therefore new communication techniques for system efficiency and ubiquitous connectivity is of relevant importance.

Large intelligent surface (LIS) is an emerging concept that has been recently proposed for achieving the above goals in beyond 5G communication systems. It enables the reconfiguration of the radio propagation environment for favorable transmission as well as the design of low-complex mMIMO radios. The LIS operates by changing the electromagnetic characteristics of its elements in a way the incoming waves are reflected towards desired destinations (e.g. base stations and mobile users) to increase the network coverage and reliability and provide signal-to-interference-plus-noise ratio gains. This concept can be realized by arrays of low cost antennas, smart reflect arrays and reconfigurable meta-surfaces.

The aim of this project is to develop physical layer (PHY) algorithms that exploits the benefits brought by LISs to increase the communication system performance. There are options, including, but not limited to:

- LIS-based network deployment techniques.
- Channel state information (CSI) acquisition techniques
- Coordinated base station - LIS processing techniques.



Profile:

- Good background in communication theory and mathematics.
- Previous experience with simulations in Matlab.

Kontakt/Contact: j.luque@nt.tu-darmstadt.de ☎ 06151-16 22381 Raum/Room S3 10/516