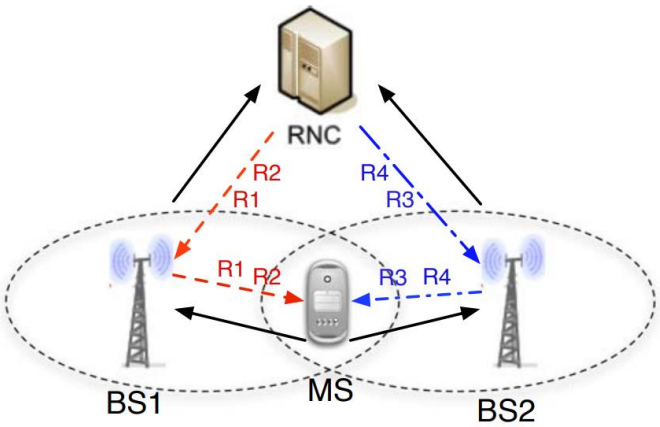
TECHNISCHE UNIVERSITÄT DRESDEN

Fakultät Elektrotechnik und Informationstechnik, Deutsche Telekom Lehrstuhl für Kommunikationsnetze

"Network-coded Handovers and Diversity Concepts"

Project Topic in OS Kommunikationssysteme WS 2019/20



Summary: Modern communication networks are increasingly used by mobile nodes. Especially the area of autonomous vehicles such as cars or drones places high demands on the latency and reliability of the network. To achieve the Quality of Service (QoS) criteria in radio access for mobile application scenarios, spatial diversity concepts based on the use of multiple antennas for TX or RX are used. In addition, multi-connectivity approaches exist which enable an uninterrupted handover between two cells of the network. As a general principle, the methods work mostly with common repetition codes in which identical information is transmitted in different paths. In this study, network coding is to be used to efficiently send information from multiple access points to a communication node in order to improve both latency and reliability in communication compared to conventional codes. The student will familiarize himself with existing diversity and handover concepts. Subsequently, the student designs methods with optimized information flow using network coding and evaluates these according to different performance metrics, e.g. latency, bandwidth, complexity.

Components to learn: kodo, nckernel, pynckernel

Requirements: Python, C, Basic knowledge about network coding

Steps of the project to go through:

Investigation of state-of-art concepts for handover and diversity

Design of five handover or diversity concepts using network coding

Implementation and evaluation of three concepts

Keywords: Network Coding, Diversity, Handover

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