# Resource Allocation and Multiple Access Design for Personalized URLLC Services

Keywords

Multiple Access, Ultra Reliable Low Latency Communication (URLLC), Resource Allocation, Personalized Services, Convex Optimization.

Description

As a key feature in beyond 5G networks, ultra reliable low latency communication (URLLC) has enabled various applications, like health monitoring, remote operations, autonomous driving, virtual and augmented reality. Different from traditional wireless communications, the low latency constraint in URLLC generally forces the data transmission to be operated in an extremely short time slot, which leads to a reliability issue. In accordance with the rapidly growing network scale, the future 6G wireless networks will be expected to support massive connectivities, such as the enormous sensors and actuators in an autonomous factory. Meanwhile, the different functionalities at users have also stimulated personalized URLLC demands. As a result, how to support massive URLLC users with personalized service requirements appears as an open issue to be addressed. Toward this end, advanced multiple access designs, as well as efficient allocation strategies for the limited radio resources, are highly recommended for enhancing the service quality in URLLC networks.
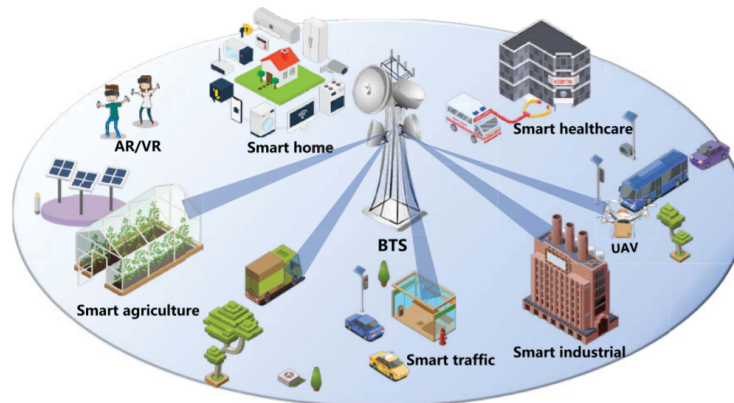
Goal

For the goal of this thesis, the student will be expected to learn about the URLLC concept and different multiple access strategies. Under guidance, the student will be expected to complete a multiple access design for a specific URLLC scenario and validate the results numerically.

Requirements

- Basic knowledge in wireless communications
- MATLAB programming skills
- Motivation to learn new materials and work efficiently

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(Potential HiWi position after an inquiry)