Master's Thesis

Proactive load-aware wireless resource allocation for sustainable 6G network

The rapid growth of traffic and the number of connected devices in the 5G and beyond wireless networks focus the attention on sustainability in the radio access network (RAN). Traffic load and status of available wireless resources in the network change rapidly, especially in scenarios with a large number of connections and high mobility. The high connectivity is caused by exponentially increasing Internet of Things (IoT) devices connected to the network for supporting various use cases ranging from Industry 4.0 to healthcare.

IoT devices mainly powered by batteries are characterized by low cost, low complexity, and limited computational resources. Therefore, elongating their lifetime while fulfilling the quality of service (QoS) requirements poses a new research challenge. To tackle this problem, context awareness of devices consisting of device type and mobility; and the network traffic load simultaneously enhance the wireless resource management and the management of the devices states. Moreover, to enable awareness of the neighboring cells, the predicted information on the traffic load can be exchanged among cells. The above affects the decisions of accepting the device or offloading it to the neighboring cell and the device's operating state.

In this thesis, the student will focus on developing and testing a context-aware resource allocation mechanism based on device mobility and traffic load, focusing on decreasing individual devices' energy consumption and reducing processing latency.

Prerequisites

- Good knowledge of Python and Matlab programming.
- Good mathematical background.
- Knowledge of mobile networks.

Contact

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Advisors

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