

Dynamic resource management in mobile networks

Mobile networks have evolved from the technology designed solely for voice services to the means enabling connectivity of everything. This motivates an extension of the traditional scheme of communication in the mobile networks via base stations towards a direct communication among devices. Such communication, however, imposes high volume of signaling and overhead for communication management resulting from the requirement on measurement of channel quality among communicating devices. To suppress the excessive radio resource consumption for the channel quality measurement, a machine learning-based prediction of the channel quality between devices will be outlined. An application of such approach to the scenario with base stations mounted on flying objects, such as drones, will also be demonstrated. The channel quality prediction further allows to overcome limitations blocking adoption of the flying base stations in an energy efficient transparent mode in standardization and in practice. Since the mobile networks are no longer designed only for communication services, an enhancement with the cloud computing paradigm and possibilities to exploit computing in clouds at the edge of mobile networks for energy savings in the mobile devices will be illustrated. The presentation will be concluded by an outline of promising research directions towards the next generation of mobile networks.