Today’s wireless services have come a long way since the rollout of the conventional voice-centric cellular systems. The demand for wireless access in voice and high data rate multimedia applications has been increasing. New generation wireless communication systems are aimed at accommodating this demand through better resource management and improved transmission technologies.

The interest in increasing the Spectrum Access and improving the Spectrum Efficiency combined with both the introduction of Software Defined Radios and the realization of the idea that machine learning can be applied to radios has created new intriguing possibilities for wireless radio researchers. In this presentation, we will discuss the cognitive radio, software defined radio, and adaptive radio concepts from several aspects. Cognitive radio and cognitive networks are investigated from a broad aspect of wireless communication system.