Prof. Feng Zhiyong (Beijing University of Post and Telecommunications), “Cognitive Cellular Systems in China: Challenges, Solutions and Testbed”

This talk will give an overview on the challenges, solutions and testbed of cognitive cellular systems in China.

Introducing cognitive radio functions into cellular systems poses several technical challenges. First, users in the cognitive cellular systems should be provided with quality guaranteed services, which should consider the delay and interference issues. Second, how to obtain the cognitive information is a big challenge in the changing environment. Thus, the joint multi-domain database and spectrum sensing algorithm is proposed to accurately and efficiently obtain multiple cognitive information. Third, the explosive growth of various high-data rate applications sets higher requirements for radio access network, where TD-LTE cellular network is a promising solution with much wider bandwidth and throughput. Last but not least, dynamic spectrum management is an indispensable part in system design, where spectrum sharing between cognitive cellular systems and other systems as well as spectrum sharing among cognitive cellular systems should be focused on.

Besides technical challenges, it is noteworthy that the fate of CR depends on the policy makers’ decision, which presents political challenges and thus motivates the birth of new candidate spectrum allocation modes that will bring economic and social benefits to China.

Two cognitive TD-LTE cellular testbeds are built to verify key technologies to solve the challenges mentioned above and to evaluate the performance of the cognitive cellular system in China. One is a platform on which both a primary and a secondary system (i.e. the cognitive cellular system) coexist, while the other is a platform on which multiple cognitive cellular systems coexist.