Decentralized Channel Assignment and Power Allocation in a Full-Duplex Cognitive Radio Network

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Full duplex (FD) communication as well as Cognitive radio (CR) have both been proposed to increase spectrum efficiency. Until the recent advances in self-interference cancellation (SIC) techniques, the transmissions between the transmitter and the receiver were either done in different time slots (Time division duplex) or different frequency bands (Frequency division duplex). According to [1] roughly 100dB Isolation/cancellation between transmitter and the receiver is required for a satisfactory quality or service (QoS) in FD communication. Most work in the literature advocates the use of radio frequency (RF) isolation/cancellation at the antenna and duplexer, and/or digital domain filtering of self-interference, to realize FD communication. In the literature there are some work already addressing the use of FD transmissions in CR applications. In this presentation we propose a decentralized joint channel assignment and power allocation scheme for a decentralized CR network which makes use of FD communication. In this scheme each pair of secondary users (SUs) decide which channels should be used as half duplex (HD) and which channels should be used as FD to maximize the throughput between the pair. The interference to the primary users are kept below a threshold using the measurements at monitoring stations. Monitoring stations (MSs) inform the CRs about the interference level in the previous measuring instant and the number of pairs of CR users, using a control channel. The concept of a MS was also used in [2]. Then the CR pairs make their transmission decisions using this information and the information on the channel gains between the pair and the monitoring stations, after solving an optimization problem.

REFERENCES
