Project-1: Automatic Modulation Classification and Signal Separation

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Pictures for illustrations on the separate page:
Subproject-1: Automatic Modulation Classification

In communication systems, the modulation type of the signal is necessary for the receiver to conduct demodulation properly. However, in many advanced communication systems such as cognitive radio, the information on signal modulation is not available at the receiver. In these cases, automatic modulation classification and parameter estimation are desired. Meanwhile, when the receiver is equipped with only one antenna as is preferred in many systems requiring low cost and high compactness, heavy co-channel interference will happen and make this task challenging. This project aims to investigate the methods for automatic modulation classification of multiple digital modulation signals in a receiver with single antenna by exploiting the signal cyclostationarity.

Subproject-2: Blind Channel Codes Identification

Channel codes have been widely used in communication systems to improve the system performance by adding redundancy to the transmitting data sequence. In practical operations, the information of the channel codes need to be known at the receiver side. This is usually done by transmitting some control information to the receiver if no prior agreement between transmitter and receiver is made. This approach will incur some capacity loss. Instead, in advanced communication systems applying automatic modulation and coding, channel code need to be blindly identified at the receiver side. This project aims at automatic channel codes identification which is essential to systems adopting automatic modulation and coding.