Effect of Social Relations on Cooperative Sensing in Cognitive Radio Networks

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Abstract

Previous works in cognitive radio networks (CRNs) have shown that cooperation in sensing improves sensing relia- bility and in turn enhances the network throughput. However, the cooperative behavior is accepted as the default mode of operation, which may not always hold. In this work, we loose this assumption and introduce a cooperative mode of operation conditioned on social relations between Cognitive Radios (CRs). Rather than taking CRs as wireless devices with no context, we associate each CR with its user that has some social relations, e.g. friendship, community, selfishness. Using these relations among CRs, we propose a social-aware cooperative sensing scheme and analyze its effects on sensing performance. We believe that exploiting social metrics assists cooperative sensing in CRNs and a model with social relations embedded will fit better to the next decade's networking paradigm.