

应用

一种SSDF攻击检测的证据理论合作频谱感知算法

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摘要:

现有的基于证据理论的合作频谱感知认为所有认知用户都是诚实的, 没有考虑恶意用户的存在。当恶意用户篡改本地感知的结果, 发送错误的证据到数据融合中心, 将会降低合作频谱感知的性能, 这种攻击称为频谱感知数据篡改 (spectrum sensing data falsification, SSDF) 攻击。由于恶意用户发送的证据与其它认知用户的证据存在差别, 本文使用Jousselme距离来衡量证据的可信度, 提出一种SSDF攻击检测算法。数据融合中心接收所有认知用户的证据, 让可信度低的证据不参与融合判决, 可信度高的证据根据可信度进行加权融合。仿真结果表明, 所提出的SSDF攻击检测算法在恶意用户发起SSDF攻击时可以很好的改善频谱感知性能。

关键词: 合作频谱感知; 证据理论; SSDF攻击; Jousselme距离

A D-S Theory Cooperative Spectrum Sensing Algorithm with SSDF Attack Detection

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Abstract:

The current cooperative spectrum sensing based theory of evidence think all cognitive users are honest and doesn't consider malicious users existing. When malicious user falsifies the local sensing result and sends error evidence to the data fusion center, it will reduce the cooperative spectrum sensing performance, which is called spectrum sensing data falsification(SSDF) attack. Due to the difference between the malicious user's evidence and other cognitive users', we use the Jousselme distance to calculate the credibility of evidence and proposes an SSDF attack detection algorithm. When the data fusion center receives all cognitive users' evidence, it excludes the evidence with lower credibility and combines higher credible evidence weighted according to credibility. As simulation results shown, the SSDF attack detection algorithm can improve the performance of cooperative spectrum sensing with malicious users existing.

Keywords: cooperative spectrum sensing evidence theory SSDF attack; Jousselme distance

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