A Survey of Cognitive Radio Handoff Schemes, Challenges and Issues for Industrial Wireless Sensor Networks (CR-IWSN)

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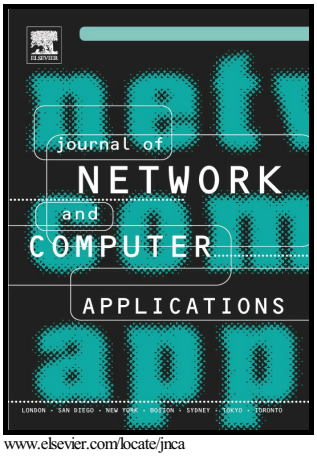

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A Survey of Cognitive Radio Handoff Schemes, Challenges and Issues for Industrial Wireless Sensor Networks (CR-IWSN)

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Abstract

Industrial wireless sensor network (IWSN) applications are mostly time-bound, mission-critical and highly delay sensitive applications therefore IWSN defines strict, stringent and unique QoS requirements such as timeliness, reliability and availability. In IWSN, unlike other sensor networks, late arrival of packets or delay or disruption to an on-going communication are considered as critical failure. Also, because IWSN is deployed in the overcrowded industrial, scientific, and medical (ISM) band it is difficult to meet this unique QoS requirements due to stiff competition for bandwidth from other technologies operating in ISM band resulting in scarcity of spectrum for reliable communication and/or disruption of ongoing communication. However, cognitive radio (CR) provides more spectral opportunities through opportunistic-use of unused licensed spectrum while ensuring minimal interference to licensed users. Similarly, spectrum handoff, which is a new type of handoff in cognitive radio, has the potential to offer increase bandwidth, reliable, smooth and interference-free communication for IWSNs through opportunistic-use of spectrum, minimal switching-delays, and efficient target channel selection strategies as well as effective link recovery maintenance. As a result, a new paradigm known as cognitive radio industrial wireless sensor network (CR-IWSN) has become the interest of recent research efforts. In this paper, we highlight and discuss important QoS requirements of IWSN as well as efforts

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