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## Cognitive radio based sensor network in smart grid: Architectures, applications and communication technologies

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### ABSTRACT:

The cognitive radio-based sensor network (CRSN) is envisioned as a strong driver in the development of modern power system smart grids (SGs). This can address the spectrum limitation in the sensor nodes due to interference caused by other wireless devices operating on the same unlicensed frequency in the Industrial, Scientific and Medical band. These sensor nodes are used for monitoring and control purposes in various components of a SG, ranging from generation, transmission, and distribution, and down to the consumer, including monitoring of utility network assets. A reliable SG communication network architecture is required for transferring information which is needed by the SG applications, alongside the monitoring and control by CRSN. Hence, this paper investigates and explores the CRSN conceptual framework, and SG communication architecture with its applications; vis-à-vis the communication access technologies, including implementation design with quality of service support. Consequently, this paper highlights various research gaps, such as implementation design model, utilization of LPWAN for CRSN based SG deployment, and so on. This includes discussion on the future direction for various aspects of the CRSN in SG. To address these research gaps, we introduced a smart unified communication solution to improve the efficiency of the SG and mitigate various associated challenges.