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Principles in wireless building health monitoring systems.

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Monitoring the structural state of a building is essential for the safety of the people who work, live, visit or just use it as well as for the civil protection of urban areas. Many factors can affect the state of the health of a structure, namely man made, like mistakes in the construction, traffic, heavy loads on the structures, explosions, environmental impacts like wind loads, humidity, chemical reactions, temperature changes and saltiness, and natural hazards like earthquakes and landslides. Monitoring the health of a structure provides the ability to anticipate structural failures and secure the safe use of buildings especially those of public services. This work reviews the state of the art and the challenges of a wireless Structural Health Monitoring (WiSHM). Literature review reveals that although there is significant evolution in wireless structural health monitoring, in many cases, monitoring by itself is not enough to predict when a structure becomes inappropriate and/or unsafe for use, and the damage or low durability of a structure cannot be revealed (Chintalapudi, et al., 2006; Ramos, Aguilar, & Lourenço, 2011). Several features and specifications of WiSHM like wireless sensor networking, reliability and autonomy of sensors, algorithms of data transmission and analysis should still be evolved and improved in order to increase the predictive effectiveness of the SHM (Jinping Ou & Hui Li, 2010; Lu & Loh, 2010) .

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