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## Abstract

The wireless body area network (WBAN) is a wireless network used for communication among sensor nodes operating on, in or around the human body in order to monitor vital body parameters and movements. The pursuit of higher quality of life motivates people to be more concerned about their health and potential diseases. At the same time, many patients can benefit from continuous monitoring of their diagnostic procedures. All these require a convenient healthcare surveillance system to monitor people's health status anytime anywhere, especially when people suffer an acute event, such as a sudden heart attack. The tracking capability of such a system should also be able to provide optimal maintenance after a

surgical procedure and support early detection of abnormal health conditions. This project investigates the efficient design of the PHY layer architecture for wireless body area networks (WBAN), which targets on ultra-low power consumption with reliable quality of service (QoS). A low cost baseband transceiver specification and a data processing flow are proposed with a comparatively low-complexity control state machine. A multifunctional digital timing synchronization scheme is also proposed, which can achieve packet synchronization and data recovery.

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