

“Safe-Sphere: Intelligent, Wearable Ecosystems for Proactive Safety Using SoC and IoT Technologies”- Literature Survey

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Abstract:

A survey on my subject, “Safe Sphere: Intelligent Wearable Ecosystems for Proactive Safety Using SoC and IoT Technologies”, Here, wearable Internet of Things technologies are quick revolutionizing healthcare by enabling early intervention and continuous vital sign monitoring. Data delays, security threats, and patient privacy issue have all been greatly simplified by the emergence of edge computing, federated learning and blockchain. This paper is a systematic review of how secure and agile System-on-Chip (SoC) architectures are facilitating wearable health monitoring, particularly in vulnerable populations such as the elderly and children. We introduce the recent advances in low-power embedded system design, flexible framework development based on resources from cloud, fog, and edge platforms, and sensor integration. Low-power SoC platforms that facilitate real-time health analysis at the edge and in situ sensor processing are of special interest. The survey also discusses how federated learning and light weight machine learning models facilitate privacy-friendly analytics, and how blockchain technology can facilitate access control and provide end-to-end audit trails. We conclude with the traditional challenges such as the absence of industry standards, restricted battery life, and the digital health record interoperability challenge. We also emphasize the need for more research in smarter sensor design, improved AI methods, and in the ethical deployment of these systems.

Keywords:

Wearable IoT, System-on-Chip, Edge Computing, Federated Learning, Blockchain, Predictive Healthcare.