

# Human Healthcare Prediction with Human Activity Patterns Recognized Using Radio Waves and Machine Learning Approach

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## **Abstract**

Modern healthcare infrastructures facilitate healthcare professionals to collect and process data of large patient groups. However, these structures demand prolific sensor deployment and embedded processing devices, which results in increased complexity and system costs. Further, some healthcare systems even require real time human assistance to ensure reliable data collection. Promising high accuracy, hand-free operation, non-human intervention, ease of use, compatibility with the current infrastructure, remote data acquisition and monitoring, healthcare data analysis and prediction, are the primary key challenges that demand newer innovative solutions.

In this project, we propose an innovative healthcare prediction system and aim to advance an energy-efficient and cost economical solution that addresses the needs of elderly populations and healthcare data analysts. We implement a modular system approach in healthcare monitoring systems to ensure reliable data collection and acquisition. Our system targets to acquire human activity data with the devised innovative testbed to monitor and predict human healthcare. We propose a blended system comprising, Software Defined Radios (SDRs) for human motion recognition, and Machine Learning algorithms to predict healthcare statistics. Using SDRs allow more flexibility to explore possible optimization of proposed system at different frequency spectrum and permit precise control over different wireless communication parameters. With Machine learning algorithm, our proposed system classifies human activity behaviors to evaluate and predict healthcare statistics. Further, researchers aim to examine precise features that establish the relationship between human activity and health improvement behaviors.

The proposed system will serve as a non-invasive human activity monitoring and prediction system; thereby eliminating the need of prolific sensor deployment. Additionally, critical movement patterns can be monitored, in response to which the system can send immediate alerts to various healthcare and caregivers. Thus, the devised system will actively monitor human health conditions and predict statistics for healthcare professionals.