Leading the Charge: A Guide to Management, Entrepreneurship and Technology in the Dynamic Business Landscape

Edition 1

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Issue
Leading the Charge: A Guide to Management, Entrepreneurship and Technology in the Dynamic Business Landscape Edition 1

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Study of an Innovative Approach to IoT Based Human Activity Recognition

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Abstract

Recognizing human activities is vital for numerous contemporary applications rooted in the Internet of Things (IoT) framework, spanning from the creation of intelligent video surveillance setups to the advancement of robotic assistants for the elderly. Recently, there has been significant exploration into machine learning algorithms to enhance the recognition of human activities. Despite these research endeavors, there remains a notable dearth of studies focusing on efficiently recognizing complex human activities, particularly those involving transitions, and no research has been conducted to assess the impact of noise in training data on algorithm performance. This paper addresses these gaps by presenting an innovative activity recognition system centered on a neural classifier with memory capabilities, designed to optimize the classification of both transitional and non-transitional human activities. Utilizing unobtrusive IoT devices such as accelerometers and gyroscopes integrated into widely-used smartphones, the system effectively identifies human activities [1,2]. The key feature of the proposed system lies in leveraging a neural network augmented with short-term memory to retain information about preceding activities' characteristics. Experimental validation demonstrates the reliability and accuracy of the proposed system compared to state-of-the-art classifiers, highlighting its robustness in handling noisy data.

Human Activity Recognition (HAR) is essential for various modern applications within the Internet of Things (IoT) framework, from developing intelligent video surveillance systems to enhancing robotic assistants for the elderly. Despite significant advancements in machine learning algorithms for HAR, there is a notable lack of research on effectively recognizing complex human activities, particularly those involving transitions, and assessing the impact of noise in training data on algorithm performance. This paper addresses these gaps by presenting an innovative activity recognition system centered on a neural classifier with memory capabilities. Designed to optimize the classification of both transitional and non-transitional human activities, the system employs unobtrusive IoT devices such as accelerometers and gyroscopes integrated into widely used smartphones [1,3]. A key feature of the proposed system is the utilization of a neural network augmented with short-term memory to retain information about preceding activities' characteristics. Experimental validation demonstrates the system's reliability and accuracy compared to state-of-the-art classifiers, emphasizing its robustness in handling noisy data.