Title: Deep Learning Approaches for HAR of Daily Living Activities Using IMU Sensors in Smart Glasses

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Abstract:

The paper discusses the development of intelligent technologies, specifically focusing on smart glasses as wearable devices for various purposes, including healthcare monitoring, fall detection, sleep tracking, and human activity recognition (HAR). While smartphones and smartwatches are commonly used for sensor-based HAR, this study explores the use of IMU sensor data from smart glasses. The authors propose a hybrid deep neural network that extracts spatial-temporal information from raw data for activity identification. They evaluate different deep learning models using a publicly available benchmark dataset called UCA-EHAR and find that the CNN-LSTM model achieves the best effectiveness with a high F1-score of 93.20%.

Keywords: smart glasses, deep learning, human activity recognition, IMU sensor

Introduction:

The introduction highlights the increasing popularity of wearable intelligent technologies and their applications in various fields, such as the commercial, entertainment, and healthcare industries. Human activity recognition (HAR) is a machine learning problem that predicts everyday tasks using sensor data. The paper focuses on HAR using IMU sensors in smart glasses, which are less intrusive compared to other wearables. The authors propose a CNN-LSTM hybrid model to extract spatial-temporal characteristics from raw sensor data and evaluate its effectiveness using the UCA-EHAR dataset.

Rest of the Paper:

The paper outlines the following sections:

- Section II: Related Works: This section discusses previous efforts to develop datasets for smart glasses in HAR research.

- Section III: Proposed CNN-LSTM Model: The authors provide a detailed explanation of their proposed hybrid deep learning model.

- Section IV: Results: The results of their investigations, including evaluation metrics such as F1-scores and confusion matrices, are presented in this section.

- Section V: Future Studies: The paper concludes with a discussion on the need for further research in the field of HAR using smart glasses.

Please note that the content of the paper beyond this point has been truncated and is not available.