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Heat Stroke Prediction: A Perspective from The Internet of Things and Machine Learning Approach

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ABSTRACT

With the increasing occurrence of heat-related illnesses due to rising temperatures worldwide, there is a need for effective detection and prediction systems to mitigate the risks. This paper explores the use of Internet of Things (IoT) and machine learning algorithms in the context of heat stroke prediction. Existing works in the field are reviewed, focusing on the deployment of IoT and the application of machine learning techniques. While previous research has made progress in developing wearable devices with multiple sensors and implementing various machine learning algorithms, significant research gaps still need to be addressed. Combining lightweight wearable devices with sophisticated machine learning algorithms can significantly improve the detection and prediction of heat-related illnesses.

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1. INTRODUCTION

One of the news from New Straits Times on 13 May 2023 have reported that number of hot weather-related cased is subject to increase because of the present heat season which is predicted to last till August mentioned by Lukanisman Awang Sauni, Malaysia Deputy Health Minister [1]. On 14 May 2023, one of the Philippine's cities, Diplolog reported have reached 47 degrees celsius in the afternoon, which is the danger category and more likely to cause heat-related illness if continued sun exposure [2]. In Singapore, the number of cases related to heat injury has increased compared to past few months due to the high temperature in mid-May [3]. As many countries have reported high environment temperature which can lead to high risk of getting heat-related illness.

Internet of Things (IoT) refers to a network of interconnected physical devices embedded with sensors, software, and connectivity capabilities to exchange data and interact with the environment. These devices can range from everyday objects like household appliances to complex systems such as industrial machinery or smart cities [4] [5]. IoT enables the collection and sharing of real-time data, enabling remote monitoring, control, and automation of various processes. On the other hand, machine learning (ML), is a subset of artificial intelligence that focuses on algorithms and statistical models that allow computers to learn from data and make predictions or take actions without being explicitly programmed. ML algorithms analyze datasets to identify patterns, relationships, and insights, and use that knowledge to make accurate predictions or decisions [6] [7].

In the context of heat-related illness prediction, IoT and ML can significantly contribute to improving early detection and prevention. IoT devices equipped with sensors can continuously monitor environmental temperature, humidity, and individual health parameters such as body temperature, heart rate,