熱中症対策ヘルメットデバイスの開発 -頭部発汗量から全身発汗量の推定-

Development of Helmet Devices to Combat Heat Stroke -Estimation of total body sweat from the amount of head sweat-

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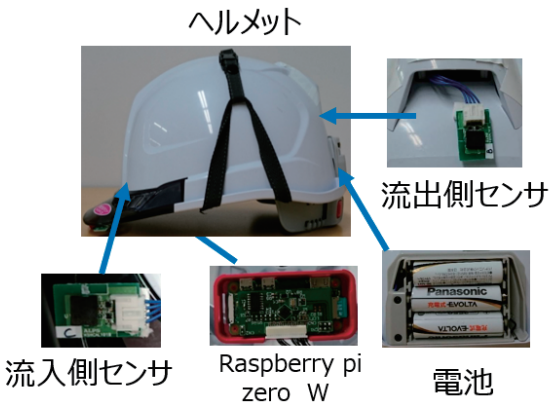

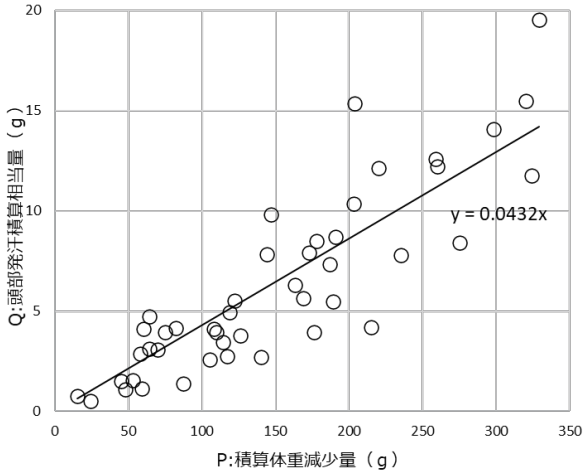

概 要

建設現場で着用義務のあるヘルメットに着目し、熱中症対策として熱中症の危険性を検知するウェアラブルデバイスを開発した。熱中症の危険性を早期に発見するために、暑熱下で作業する作業者の発汗量を計測する。本デバイスは、作業者の頭部発汗量をリアルタイムに計測し、そこから全身発汗量を推定する。暑熱環境下において開発したウェアラブルデバイスを装着しながら歩行実験を行い、頭部発汗量を計測した。その結果、頭部発汗量と全身発汗量の相関が強いことを確認した。また、本デバイスで推定される全身発汗量は、熱中症疾患の判断に有効な指標である深部体温上昇よりも、早い段階で熱中症の危険性を推定できる指標として使用できる可能性も確認できた。

Focusing on helmets that are obligatory to wear at construction sites, we have developed a wearable device that detects the risk of heat stroke as a preventive countermeasure. To detect the risk of heat stroke at an early stage, the amount of sweat of workers working in the heat is measured. Our device measures the amount of head sweat of the worker in real time and estimates the amount of total body sweat from there. A walking experiment was conducted while wearing a wearable device developed in a hot environment, and the amount of head sweat was measured. As a result, it was confirmed that the correlation between the amount of head sweat and the amount of total body sweat was strong. In addition, it was confirmed that the amount of total body sweat estimated by this device can be used as an index that can estimate the risk of heat stroke at an early stage rather than the increase in core body temperature, and total body sweat amount is an effective index for determining heat stroke condition.