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mWIoTAuth: Multi-wearable data-driven implicit IoT authentication

Multi-wearable biometric authentication system securing IoT devices without passwords or pins.

Purdue researchers have developed a model called mWIoTAuth (multi-Wearable Internet of Things Authorization) that utilizes data derived from two or more wearable devices, such as Fitbit and Wellue, to create a unique identification system for each user. Leveraging data curated from these wearables, such as heartrate, oxygen saturation values, and calorie burn, the system provides enhanced end-user information security by building identifiable patterns that correspond to each individual user. The Internet of Things (IoT) plays an integral role in the daily lives of people all around the world, but security for our everyday devices typically includes only knowledge-based authentication or no authentication at all. The system developed at Purdue instead offers a novel IoT end-user authentication approach that does not require the need to directly input information such as a password or PIN, thus better protecting end-users from data breaches and losses.

Technology Validation:

A 2-phase study with two separate cohorts of 40 subjects wearing Wellue and Fitbit in their daily life for continuous 8 hours was conducted. It was found that models developed from two wearables have 5% -- 14% higher accuracy and F1 scores compared to the single-wearable models. These findings showed the promise of developing multi-wearable implicit authentication for end-users to secure the IoT world, which is accessible via wearables.

Advantages:

-Enhanced security

-Brings authentication technology to consumer wearables

-Unique user identification

Technology ID

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Category

Digital Health & Medtech/Wearable Health Tech & Biosensors

Computing/Internet of Things (IoT)/Audio & Acoustic Edge Devices

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-Double-wearable models demonstrate higher accuracy than single-wearable models

Applications:

-IoT Security

-Wearables, such as smartwatches

Publications:

Vhauri, S., et al, "mWIoTAuth: Multi-wearable data-driven implicit IoT authentication," Future Generation Computer Systems. 159. October 2024. pp. 230 â€“ 242. https://doi.org/10.1016/j.future.2024.05.025

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