2023 年度年次報告書 IoT が拓く未来 2021 年度採択研究代表者

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An Accessibility Assessment Toolkit for Inclusive IoT Design using Onbody Sensing

研究成果の概要

The focus of the work carried out during the third year of this fellowship was the exploration of community based scenarios in which previously developed wearable sensing devices could be used to augment capabilities and facilitate inclusive interaction. Particular attention was dedicated to the potential of integrating IoT sensing with AI to reduce cognitive load and enhance cognition.

Throughout the year we have deployed unobtrusive sensors including wristbands for physiological monitoring, wearable low-profile eye trackers, breathing belts, and EMG devices to monitor physiological responses of diverse individuals in a variety of activities, including physical exercises, daily tasks, media consumption, and vocal training. Our goal in these studies was to detect the occurrence of stressful situations, and understand the specific elements which can ease or exacerbate cognitive load to develop more inclusive and accessible practices.

To expand our research and encompass the integration of solutions which can leverage the power of novel AI technologies to address accessibility challenges, we have worked on establishing and forging new connections with other world-leading laboratories such as the Humane-AI network led by the German Research Center for Artificial Intelligence. To promote this research agenda at the international level we have organized two separate workshops at international conferences in both HCI and IoT. Our work has also been accepted at the top-tier ACM 2024 CHI conference on Human Factors in Computing Systems.

【代表的な原著論文情報】

- Barbareschi, G., Kawaguchi, M., El'Agroudy, P., Grünerbl, A., Lukowicz, P., & Kunze, K. (2023, November). AccessIOT – First Workshop on Integrating AI Technologies to Increase IoT Accessibility. In Proceedings of the 13th International Conference on the Internet of Things.
- Kunze, K., Pattie Maes, F. F. M., Wolf, K., Attiya, H., Enea, C., Rajsbaum, S., ... & Klingler, F. (2023). Cognitive Augmentation. Dagstuhl Reports, Vol. 12, Issue 12 ISSN 2192-5283.
- 3) Barbareschi, G., Kumar, T., Kim, C., Chernyshov, G., Kunze, K. (2024). "Speech is Silver, Silence is Golden " Analyzing Micro-Communication Strategies between Visually Impaired Runners and their Guides. In Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems.
- 4) El'Agroudy, P., Grünerbl, A., Barbareschi, G., Spilski, J., Kunze, K., Lachmann, T., Lukowicz, P. (2024). mobiCHAI - 1st International Workshop on Mobile Cognition-Altering Technologies (CAT) using Human-Centered AI s. - accepted