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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 on the second year of this fellowship was the design and development of suitable edge computing devices that integrate with the toolkit sensing prototypes created during the previous year. The purpose of these devices is to detect the physiological state of the wearer to identify stress and frustration during daily interactions, as well as supporting the implementation of more inclusive practices.

Throughout the year we have developed a new prototype of eye-wear sensing and adaptive technology able to simulate different types of common visual impairments in real world situation and evaluated its effect on increasing awareness and empathy towards those with access needs amongst designers. We have also explored the use of off-the shelf commercially available IoT smart glasses to facilitate digital interactions, expanded the functionality of previously built emotional sensing umbrella handles, and altered the form factor of our wearable on-body sensing devices according to the feedback provided by elderly individuals and people with access needs. Through the collaboration with nursing homes, elderly communities and other healthcare institutions we have been able to collect physiological data and conduct observation to examine the connection with IoT enabled devices and psychophysiological states to identify stressors and develop more accessible practices.

Our work has been published and presented at several prestigious HCI and Human augmentation conferences.

【代表的な原著論文情報】

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2) Zhang, Q., Wang, X., Starner, T., Huang, Y., Chernyshov, ... & Kunze, K. (2022, October). Experience Visual Impairment via Optical See-through Smart Glasses. In Adjunct Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology (pp. 1-2).

3) Ragozin, K., Marky, K., Lu, J., & Kunze, K. (2022). EyeMove-Towards Mobile Authentication using EOG Glasses. In Augmented Humans 2022 (pp. 10-14).

4) Chen, K., Han, J., Baldauf, H., Wang, Z., Chen, D., Kato, A., ... & Kunze, K. (2023, March). Affective Umbrella–A Wearable System to Visualize Heart and Electrodermal Activity, towards Emotion Regulation through Somaesthetic Appreciation. In Proceedings of the Augmented Humans International Conference 2023 (pp. 231-242).

5) Li, J., Wang, X., Chen, J., Starner, T., Chernyshov, G., Huang, J., ... & Zhang, Q. (2023, March). First Bite/Chew: distinguish typical allergic food by two IMUs. In Proceedings of the Augmented Humans International Conference 2023 (pp. 326-329).