

論 文 要 旨

Thesis Abstract

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※報告番号	甲第 252 号	氏 名 (Name)	WORAWAT LAWANONT
<p>主論文題名 (Title)</p> <p style="text-align: center;">Multi-dimensional Well-being Recognition System Using Daily Activity Data for Sustainable Living</p>			
<p>内容の要旨 (Abstract)</p> <p>Several studies suggested that older adults see digital technology devices as a tool that could facilitate not only daily activities but also maintain social relationships whilst overcoming some of the physical and geographical barriers associated with aging. The study demonstrate how older generation also value technology devices and how they are ready to adopt them into their daily life. On one hand, this will influence their behavior, on the other hand, this is an opportunity in encouraging better well-being.</p> <p>Challenges and opportunities of using these technologies to develop the monitoring platform for healthcare was discussed in another study. There are numbers of discussion in challenges in system architecture, data acquisition and sensing, data storage and processing, data analytics, and visualization. This provide a complete view of opportunities in using the emerging technology to build a monitoring platform where technology and technique like Internet of Things and machine learning are integrated into the system. Ethical issues like privacy and security were also the concern.</p> <p>This study conducted development of a well-being monitoring platform where it recognizes the well-being level in multi-dimension manner. The development of the system was based on the idea that it should raise awareness in person's current well-being level and to encourage the person toward a better behavior. We developed a total of 6 systems to address the solution of raising ones' well-being. The changes made in the development process of the first system to the final system show the improvements and how this study slowly started from tackling the smaller problem to the bigger problem with more generic solution from the foundation we had built. In total, we had over 90 human subjects participated in all of our experiments. Moreover, we have implemented numbers of machine learning algorithms, such as K-Nearest Neighbors, Support Vector machine, and Decision Tree for building a classification model. Numerous sensor devices were implemented and tested throughout the development of the systems to find out the best set of devices for</p>			

monitoring behavior and classify the well-being level. This study also used a trending approach of deep learning in order to extract useful information from video and sound, and use that information in classifying the well-being level. Moreover, an unsupervised learning method were also used as a part of developing the classification model for multi-dimensions well-being level classification. Finally, a visualization platform was developed to provide meaningful feedbacks to users.

In general, the emerging technologies provide a great opportunity in developing a platform in raising awareness, especially in encouraging well-being. However, the development of this platform should concern the effect of excessive use of technologies device itself as well. The thorough monitoring should be done effectively, but avoid being invasive, and in that respect, this study proposed a solution to that problems. This well-being platform will not only help raise awareness in users' well-being level from its complete system, but will also serves as a foundation for developing health monitoring platform where multiple sources of data and multi-dimension health are the concerns.

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