先端科学技術研究科　修士論文要旨

所属研究室 (主指導教員)	ユビキタスコンピューティングシステム (安本　慶一 (教授))		
学籍番号	2111423	提出日	令和 6年 1月 18日
学生氏名	LIN CHING-YUAN		
論文題目	Estimating Distress Levels Using Audio-Visual Data During Interaction with A Smart Speaker		

要旨

Mental health has a huge impact on humans. Psychologically, too much stress can lead to depression and low productivity, or even suicidal tendencies. Physically, it will seriously influence appetite and sleep quality, indirectly leading to other diseases. However, in most cases, people do not easily notice the accumulation of stress, and it may result in their health being in a bad state by the time they realize it, so we think it is necessary to determine the stress level of people every day.
In this thesis, we aim to realize a method to estimate the distress levels of people in their daily lives through natural conversations with a smart speaker. To this end, we conducted experiments by placing a smart speaker in the participants' bedrooms to create a home-like environment that mirrors daily life. Using a webcam, we recorded brief daily interactions between individuals and the smart speaker. From these video recordings, we extracted features related to facial expressions, voice, and heart rate data. After preprocessing the extracted features, we made separate predictions for the levels of happiness, depression, and anxiety. The labels for each emotion were obtained from questionnaires filled out by participants after each recording session using the Depression and Anxiety Mood Scale (DAMS), with each emotion's score ranging from 0 to 18.
For the nine participants, aged between 22 and 25, the experimental results yielded Mean Absolute Errors (MAE) of 1.73, 1.59, and 2.01 for happiness, depression, and anxiety distress levels, respectively. The Root Mean Square Errors (RMSE) for these three distress levels were 2.12, 2.21, and 2.45, respectively.