

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)	数理情報学 (池田 和司 (教授))		
学籍番号	2311188	提出日	令和 7年 1月 17日
学生氏名	長柄 まりも		
論文題目	Analysis and prediction of alcohol intoxication stages based on heart rate variability		
要旨			
<p>Drinking excessive alcohol has a negative effect on the mental function of humans. It is desirable to limit alcohol intake to an appropriate stage that does not cause negative effects. For this purpose, a continuous monitoring method is necessary to assess drunkenness stage. Heart Rate Variability (HRV) indicators have been attracting attention to monitor the autonomic nervous system that could be affected by excessive alcohol intake. This research aims to clarify how the HRV indicators change according to the stage of intoxication and whether it is possible to predict intoxication stages from HRV. In the experiment, we measured HRV and breath alcohol concentration from the subjects, while also conducting neurological examinations on them during alcohol intake. As part of the analysis, we report the relationships among the stages of intoxication determined from breath alcohol concentration, HRV indicators, and performance in neurological examinations. Using a machine learning approach, we also predicted intoxication stages and neurological examination performance based on HRV indicators. Our results revealed significant correlations between certain HRV indicators and breath alcohol concentration. Additionally, the Backward Digit Span Test (BDST) was found to correlate with HRV. Furthermore, we demonstrated that HRV indicators can contribute to predicting intoxication stages effectively.</p>			