# 先端科学技術研究科　修士論文要旨

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| 学籍番号 | 2011286 | 提出日 | 令和 4年 1月 20日 |
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| 論文題目 | Negative Emotion Recognition using Multimodal Physiological Signals for Driving Automation Systems<br>自動運転システムのためのマルチモーダル生理学的信号を用いたネガティブ情動認識 | | |

要旨


Driving automation systems (DAS) are being developed actively. Vehicle control by DAS satisfies safety but does not guarantee comfort. If the DAS causes discomfort to the user, it is likely that the system will not be used. Therefore, not only safety but also emotional state is an important factor in DAS.
The physiological signals are considered to be an important signal in emotion recognition, and it is expected to realize highly accurate and robust emotion recognition by handling multiple modalities.
In this research, we aim to recognize driver's negative emotions when driver's driving a vehicle using multimodal physiological signals.
By recognizing the driver's negative emotions, it will help to reduce the environmental factors which cause negative emotions and develop a better driving automation systems.
To recognize negative emotions, we implemented sparse logistic regression (SLR) using a multimodal physiological signals dataset with negative emotion labels when driving a vehicle. SLR is a statistical method that can predict the probability that a binary result will occur from a factor, and variable selection can be performed at the same time.
Negative emotions are recognized by performing a two-class classification task (Negative or not) using SLR.
The two-class classification performance of the SLR model was evaluated by nested-cross-validation (NCV). As a result of NCV, the AUC value showed that this model works as a two-class classifier to some extent. In addition, the features of physiological signals during negative emotions were extracted.