

Application of Stacked Autoencoders to P300 Experimental Data



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Deep learning has emerged as a new branch of machine learning in recent years. Some of the related algorithms have been reported to beat state-of-the-art approaches in many applications. The main aim of this paper is to verify one of the deep learning algorithms, specifically a stacked autoencoder, to detect the P300 component. This component, as a specific brain response, is widely used in the systems based on brain-computer interface. A simple brain-computer interface experiment more than 200 school-age participants was performed to obtain large datasets containing the P300 component. After feature extraction the collected data were split into the training and testing sets. State-of-the-art BCI classifiers (such as LDA, SVM, or Bayesian LDA) were applied to the data and then compared with the results of stacked autoencoders.

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