



Exploration of neural architectures for generation of synthetic epileptic seizures

In the last few years Generative Adversarial Networks (GANs) have shown outstanding performance in different generative tasks, most notably in image synthesis. One very relevant problem in which GANs can be applied is biomedical data generation. Generating synthetic biomedical data is a challenging task that has a great interest due to the fact that collecting real data is costly and sharing it has important privacy concerns. In particular, generating high-quality synthetic Electroencephalogram (EEG) signals can alleviate the need for real labeled data and improve the machine-learning-based systems for detection and treatment of different neurological conditions such as epilepsy.



In this project we build on top of previous work on GANs for generation of synthetic epileptic seizures. The existing model generates remarkably realistic seizures that can be used to train epileptic seizure detection systems. However, there are a few aspects that can be improved. In this thesis we will explore ways of improving the existing model, including conditioning on patient and/or seizure type, using self-attention and implementing some of the latest discoveries in GANs.

Requirements: Knowledge in Deep Learning, or solid background in Machine Learning. Implementation experience with TensorFlow is an advantage. The student should be able to work independently on this topic!

Interested? Please contact us for more details!

Contacts

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