KNN Attention-based EEGViT Model

Overview

KNN-EEGViT is an adapted version of EEGViT, which is a hybrid Vision Transformer (ViT) incorporated with Depthwise Convolution in patch embedding layers. We add the KNN-attention feature to the EEGVit model and expect the boost of model performance and accuracy on EEGEyeNet benchmarking tasks.

Original EEGViT:https://github.com/ruiqiRichard/EEGViT.git

Code download

```
git clone https://github.com/hzhang0229/KNNEEG.git
```

Dataset download

Download data for EEGEyeNet absolute position task in Linux environment

```
wget -O "./dataset/Position_task_with_dots_synchronised_min.npz"
"https://osf.io/download/ge87t/"
```

Pip Installation

Just in case you are using VM without pip.

```
sudo apt update
sudo apt install python3-pip
```

Requirements

First install the requirements.txt

```
pip3 install -r requirements.txt
```

We do suggest install each item listed in this txt. file individually just in case our research shows the above instruction is not working.

And then install the pytorch package independently.brew install pandoc

```
pip install torch torchvision torchaudio
```

Run the program

```
python3 main.py
```

Required Environment for Reproducibility

```
Linux System
python 3.8.10
Google Cloud VM
NVIDIA T4 GPU
×86/64 Architecture
8 vCPUs with 32GB Memory
32GB System Memory
```

Common Problems and Troubleshooting

1. If you have a NVIDIA GPU but the system prints "Using CPU", Please check if you have the GPU Driver. https://cloud.google.com/compute/docs/gpus/install-grid-drivers#install-drivers
2. Please ensure you have enough memory on your VM to download the dataset, which is around 11 GB.