## Supplementary: Learning Robust Deep Visual Representations from EEG Brain Recordings

Prajwal Singh<sup>†</sup>\*, Dwip Dalal<sup>†</sup>, Gautam Vashishtha<sup>†</sup>, Krishna Miyapuram<sup>‡</sup>, Shanmuganathan Raman<sup>†</sup>\* CVIG Lab<sup>†</sup>, BRAIN Lab<sup>‡</sup> IIT Gandhinagar, India

{singh\_prajwal, dwip.dalal, gautam.pv, kprasad, shanmuga}@iitgn.ac.in

## References

- Pradeep Kumar, Rajkumar Saini, Partha Pratim Roy, Pawan Kumar Sahu, and Debi Prosad Dogra. Envisioned speech recognition using eeg sensors. *Personal and Ubiquitous Computing*, 22:185–199, 2018.
- [2] Concetto Spampinato, Simone Palazzo, Isaak Kavasidis, Daniela Giordano, Nasim Souly, and Mubarak Shah. Deep learning human mind for automated visual classification. 2017 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), pages 4503–4511, 2016.
- [3] Praveen Tirupattur, Yogesh Singh Rawat, Concetto Spampinato, and Mubarak Shah. Thoughtviz: Visualizing human thoughts using generative adversarial network. In *Proceedings of the 26th ACM international conference on Multimedia*, pages 950–958, 2018.

<sup>\*</sup>This work is supported by Prime Minister Research Fellowship (PMRF-2122-2557) and and Jibaben Patel Chair in Artificial Intelligence.

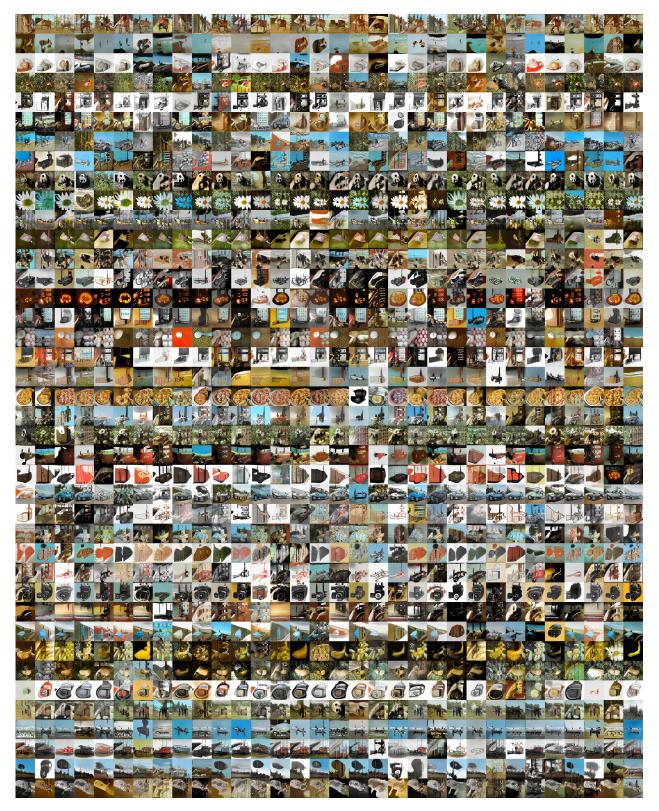


Figure 1: **EEG to Image.** Images generated from EEGStyleGAN-ADA using EEG signals for all 40 classes that show diversity and fidelity, where each image is generated with different EEG signals across different classes, EEGCVPR40 dataset [2].



Figure 2: **EEG to Image.** Sample images generated (top and bottom row) from EEGStyleGAN-ADA using EEG signals where each image is generated with different EEG signals across different classes, ThoughtViz dataset [1, 3]. There is some overlapping between classes of generated samples due to the overlapping representation learned from a small EEG dataset, which is illustrated in the main paper.