

Supplementary Materials: Cognition-Supervised Saliency Detection: Contrasting EEG Signals and Visual Stimuli

Anonymous Authors

1 EEG ELECTRODE PLACEMENT

The EEG data were recorded using 32 Ag/AgCl electrodes, arranged according to the 10–20 system, and connected to a QuickAmp USB (BrainProducts GmbH, Gilching, Germany) amplifier running at 2,000 Hz. Eye movements were detected (for artifact removal) using two pairs of bipolar electrodes for artifact detection (1 cm to the lateral canthi of the left and right eye, and 2 cm above and below the right pupil). The electrode placement is shown in Figure 1. Specifically, we used 32 equidistant electrodes situated at FP1, FP2, F7, F3, Fz, F4, F8, FC5, FC1, FC2, FC6, T7, C3, Cz, C4, T8, TP9, CP5, CP1, CP2, CP6, P7, P3, Pz, P4, P8, PO9, O1, O2, PO10, Iz, within the 10% system.

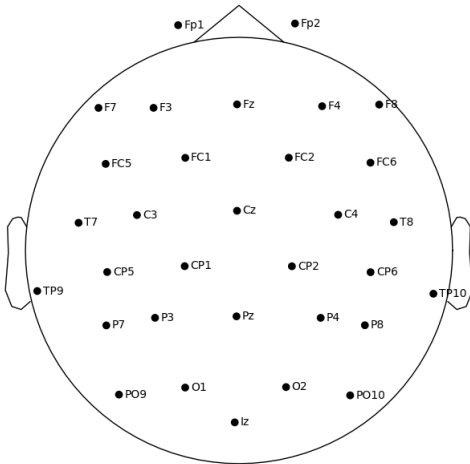


Figure 1: Visualization of electrode placement.

2 ADDITIONAL VISUALIZATIONS (SINGLE PARTICIPANT)

Similar to our visualization in section 4.5, we visualize the embeddings for each participant separately by mapping only learned embeddings from the same participant. For each task, we expect the image generated from $M_{C_{\text{Target}}}$ to contain salient task-specific semantic features and $M_{C_{\text{Non-target}}}$ to have the opposite semantic saliency. Figure 2-5 shows visualization with the candidate vectors from the training data. Figures 6-9 show visualization of the generated outputs with randomly sampled candidate vectors that are not present in the training data.

3 CODE RELEASE STATEMENT

We release our code library and the dataset at [link temporarily removed for anonymity].



Figure 2: Visualization of subsets of embeddings for each participant in task "female" and "male". The embeddings from the same participant are mapped to the stimuli image vectors.



Figure 3: Visualization of subsets of embeddings for each participant in task "blond" and "dark hair". The embeddings from the same participant are mapped to the stimuli image vectors.

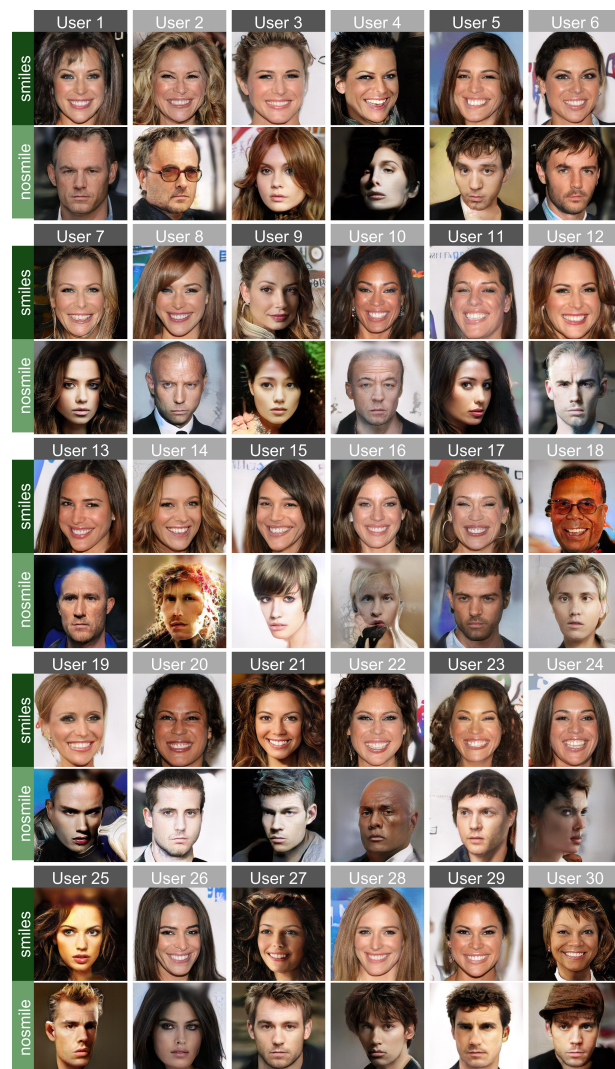


Figure 4: Visualization of subsets of embeddings for each participant in task "smile" and "no smile". The embeddings from the same participant are mapped to the stimuli image vectors.

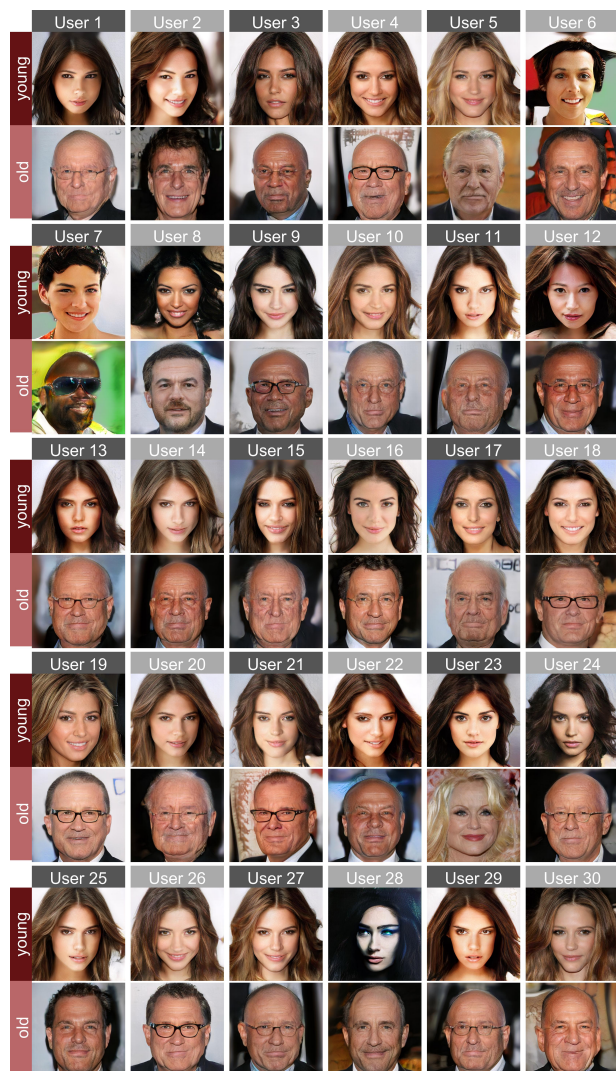


Figure 5: Visualization of subsets of embeddings for each participant in task "young" and "old". The embeddings from the same participant are mapped to the stimuli image vectors.

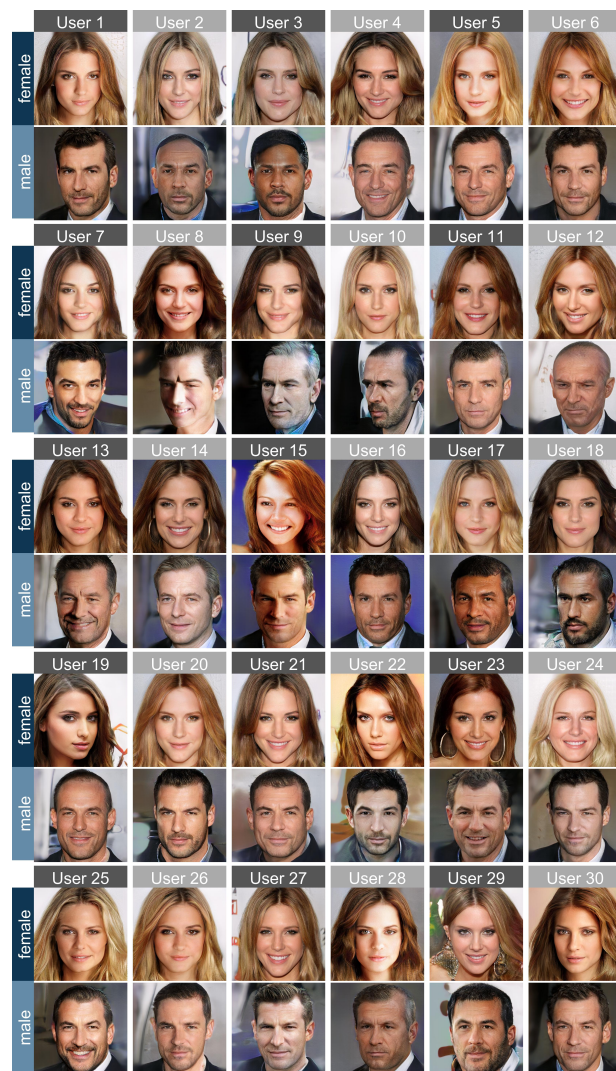


Figure 6: Visualization of subsets of embeddings for each participant in task "female" and "male", by mapping embeddings to the randomly sampled candidate set.



Figure 7: Visualization of subsets of embeddings for each participant in task "blond" and "dark hair", by mapping embeddings to the randomly sampled candidate set.



Figure 8: Visualization of subsets of embeddings for each participant in task "smile" and "no smile", by mapping embeddings to the randomly sampled candidate set.



Figure 9: Visualization of subsets of embeddings for each participant in task "young" and "old", by mapping embeddings to the randomly sampled candidate set.

4 ADDITIONAL ERP PLOTS

Here we present event-related potentials (ERP) plots for all electrodes (Figure 10). The electrode ids correspond to the 10-20 placement montage shown in Figure 1.

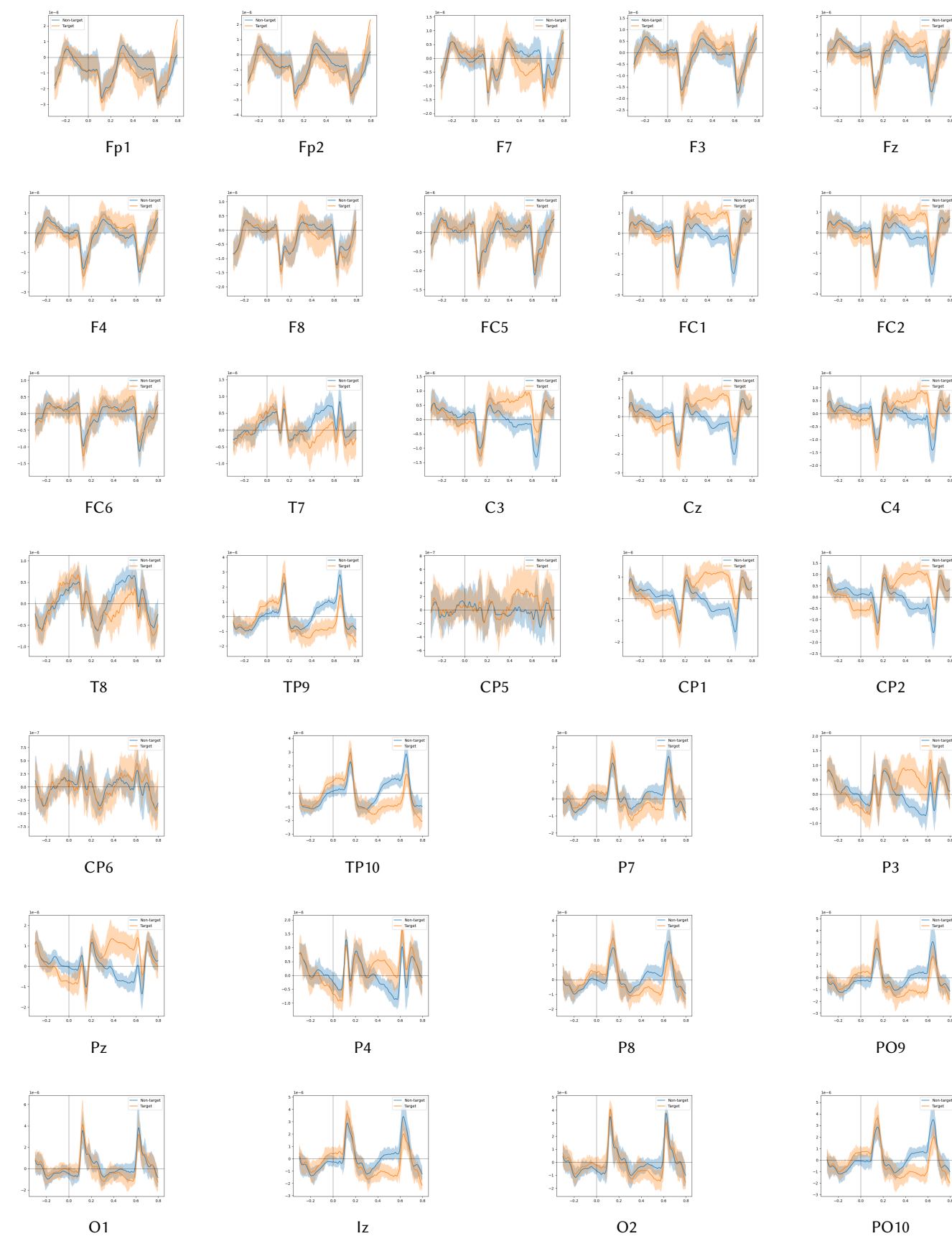


Figure 10: Average event-related potentials (ERPs) across participants at all electrodes for target and non-target stimuli. The electrode ids correspond to the 10-20 placement.