NeuroMapper: In-browser Visualizer for Neural Network Training

Authors: Zhiyan Zhou, Kevin Li, Haekyu Park, Megan Dass, Austin Wright, Nilaksh Das, Duen Horng Chau

Summary:

We present our ongoing work NeuroMapper, an in-browser visualization tool that helps machine learning (ML) developers interpret the evolution of a model during training, providing a new way to monitor the training process and visually discover reasons for suboptimal training. While most existing deep neural networks (DNNs) interpretation tools are designed for already-trained model, NeuroMapper scalably visualizes the evolution of the embeddings of a model's blocks across training epochs, enabling real-time visualization of 40,000 embedded points. To promote the embedding visualizations' spatial coherence across epochs, NeuroMapper adapts AlignedUMAP, a recent nonlinear dimensionality reduction technique to align the embeddings. With NeuroMapper, users can explore the training dynamics of a Resnet-50 model, and adjust the embedding visualizations' parameters in real time. NeuroMapper is open-sourced at https://github.com/poloclub/NeuroMapper and runs in all modern web browsers. A demo of the tool in action is available at: https://poloclub.github.io/NeuroMapper/.

ACM Author Affiliations: Zhiyan Zhou: Georgia Institute of Technology; Kevin Li: Georgia Institute of Technology; Haekyu Park: Georgia Institute of Technology; Megan Dass: Georgia Institute of Technology; Austin P Wright: Georgia Institute of Technology ; Nilaksh Das: Georgia Institute of Technology; Duen Horng Chau: Georgia Tech