

Our project plans to utilize the power of SQL drill searches through querying to provide powerful hyperparameter visualization for deep learning model optimization. Currently, software packages exist that merely provide visualizations of model performance i.e. Tensorboard and Visdom.

However, these applications rely on the user to manage their own data using a directory structure, and then parse the directory structure using regexes. This system is only functional if done correctly, but is very far from ideal as it requires users to have a strong understanding of regexes and employ data naming conventions that lend themselves to be parsed by regexes. Translating Tensorboard's event files data into databases and adding a user friendly GUI for performing SQL queries, will make parsing and analyzing Tensorboard's event files data easily accessible to all users, since it requires no setup cost and enables additional functionality not feasible through regex searches. Given the complexity of the current system, we believe that users are not able to take full advantage of the data analytics features that Tensorboard provides.

Our goal for this project is to demonstrate a self hosted web server that provides data visualizations, and an intuitive interface for SQL queries that run on a database that is composed of the information stored in Tensorboard's event files. If time permits, we would also like to make a serializer to translate users' directory structures and file outputs from Tensorboard into our application's databases for seamless integration into existing projects. Our application will provide many new functionalities in addition to what Tensorboard currently offers and simplify the hyperparameter optimization task.

Our current plan is to use python with SQLite and Flask to make a library that has the same calling conventions as Tensorboard for ease of adoption. That means that it will be able to be called from the command line to start a locally hosted web server at a specified port. All of our testing and demonstrations will be based on Tensorboard event files generated by group members from other deep learning projects that make use of Tensorboard.

Our analysis of similar works indicates that in the Beta version of Tensorboard they are adding database support, meaning you will be able to store the event files in a database instead of in a directory structure, however, based on our research, we have not found an intent for data visualization tools to use this database. As we continue project development, we will re-assess each of our goals and determine possible limitations or hurdles.

Through our brief conversation with Professor Yang regarding our project, he supported our idea. We also discussed the importance of making our project dynamic enough to handle any dataset that Tensorboard outputs, not merely focusing on a singular hyperparameter optimization task.