

# Project Guide (HW1)

## 1 File Descriptions

Below are the descriptions and functionalities for each file within the project:

1. **batch.sh** - A bash script for submitting batch jobs via SLURM, configuring various job parameters and environment setups for TensorFlow.
2. **deep\_networks.py** - Python script containing definitions for constructing deeper neural network models using TensorFlow and Keras.
3. **hw1\_base\_skel.py** - Main script for setting up, training, and evaluating the neural network, with integration of data handling and Weights & Biases.
4. **job\_control.py** - Manages and controls the execution of experiments, facilitating batch job submissions for different hyperparameter settings using a Cartesian product of parameters.
5. **plots.py** - Utility script for generating plots from experiment results, setting up plot aesthetics, and visualizing data processed by other scripts.
6. **symbiotic\_metrics.py** - Contains the implementation of custom Keras metrics, specifically the FractionOfVarianceAccountedFor (FVAF) metric.
7. **Fig\_1.png** - Visualization of true vs. predicted elbow acceleration, illustrating model prediction accuracy.
8. **Fig\_2.png** - Visualization showing the Fraction of Variance Accounted For (FVAF) as a function of training set size across different data sets.
9. **HW1\_17789223\_358\_stdout.txt** and **HW1\_17789224\_359\_stdout.txt** - Log files from SLURM jobs capturing runtime messages and outputs.
10. **HW1\_report.pdf** - Formal report detailing the methodologies, results, and analyses from the experiments.