**SPROJ\_EECE\_7398\_MXX\_V05\_Milestone\_5**

Welcome back to our [? FITB ?] tutorial series. In the previous lesson, we started training our model. Now let's check on the training progress and discuss how to ensure reproducibility in machine learning experiments, which is especially important when working with small data sets. Let's check on our training progress by examining the log files.

As you can see here, we can visualize the log files. Now, notice how the training and validation losses are changing. In a small data setting, we expect some fluctuations in the validation metrics due to limited size of the validation set. You can also visualize these metrics using tools like TensorBoard or by plotting them manually from the log file. This gives you a better understanding of the training dynamics.

Reproducibility is a significant challenge in machine learning, especially with small data sets where random initialization can have a larger impact. Here are some tips for ensuring reproducible results-- set random seeds. Always set random seeds for all sources of randomness-- Python, NumPy, PyTorch, TensorFlow, and any other library. This project uses seed setting in the configuration files, and as you can see here, I chose 42. It's my lucky number.

Also, document hardware and software. Different hardware and software versions can affect results. Document your exact setup. Version-control your code. Even small code changes can impact results. Use version control, like GitHub, and note the exact commit you used.

Save model checkpoints. Save checkpoints at regular intervals so you can go back to earlier stages if needed. Log your hyperparameters. Keep detailed logs of all hyperparameters used in your experiments. Expect some variations. Even with seed set, there might be some hardware-dependent variations. If results are significantly different, it may indicate an implementation issue.

The [? FITB ?] project handles reproducibility well by using configuration files that specify random seeds and other training parameters. The seed value ensures that the random operation during training are deterministic, making the experiment reproducible.

Analyzing the training dynamics. As the model trains, it is useful to understand what's happening under the hood. The [? FITB ?] approach uses domain adaptation to transfer knowledge from adult pose estimation to infant pose estimation. This involves starting with model pre-trained on adult poses, fine-tuning on mixture of real and synthetic infant poses, using domain adaptation techniques to bridge the gap between domains. You can see this process reflected in the training logs, where the model initially struggles with the domain gap and gradually adapts to new domain.

In this lesson, we've monitored our training progress and discussed the importance of reproducibility in machine learning experiments. In the next and final lessons, we'll evaluate our training model and wrap up with key takeaways from this project. See you there.