Edit Share

CIFAR CV PyTorch Example Results Report

An example of how to use Weights and Biases for a hyper-parameter sweep.

Jennifer Davis

This is an example report created from a 'sweep' or hyper-parameter tuning.

See the link below for the original code and notebook.

CIFAR Computer Vision PyTorch Example

The original tutorial can be found at the link below.

Training a Classifier for Computer Vision

Hyper-parameters tuned included:

- Epochs (5, 10, 15)
- Batch Size (4, 8, 16)
- Learning Rate (0.01 to 0.001)

Each of these can be set up for tuning using the 'sweep' mechanism. The code block is shown below.

```
sweep_config = {
    'method': 'random',
    'name': 'sweep',
    'metric': {
        'goal': 'minimize',
        'name': 'train_loss'
        },
    'parameters': {
        'batch_size': {'values': [4, 8, 16]},
        'epochs': {'values': [5, 10, 15]},
        'lr': {'max': 0.1, 'min': 0.0001}
     }
}
```

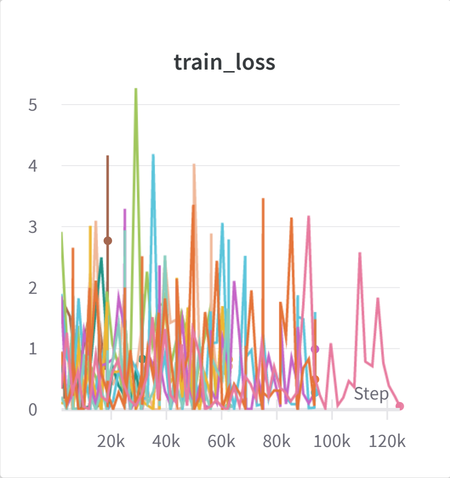
After training function is set up and the code is completed, a sweep can be performed using the block below:

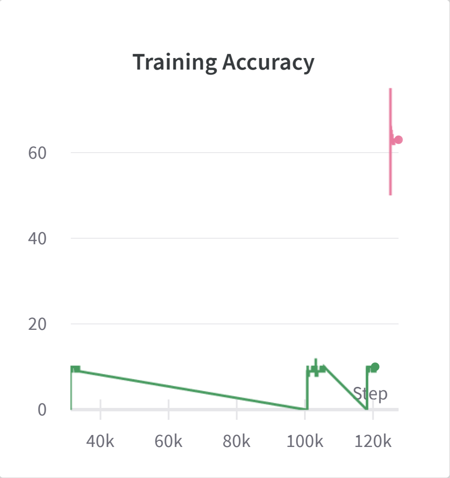
```
wandb.agent(sweep_id, function=train)
```

The output of this training sweep is shown in this report.

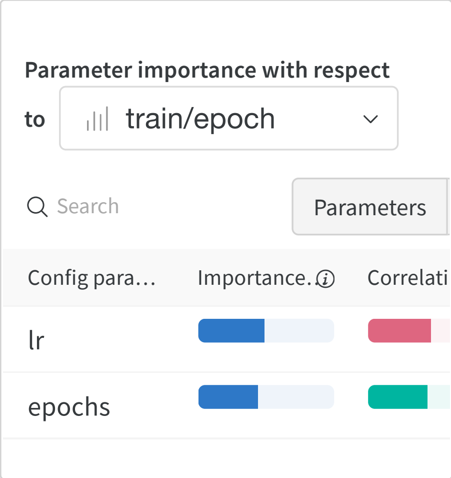
Training Loss, Best and Worst Training Accuracy and Power Usage

Overview of training loss and comparison of best and worst training accuracy.





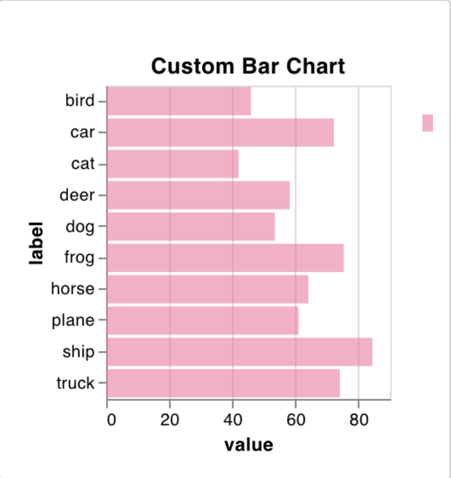
Most impactful parameters ranked in order and correlation; a bar chart showing the accuracy for each class of image; and a table of results from the sweep with the optimized parameters based on training loss.

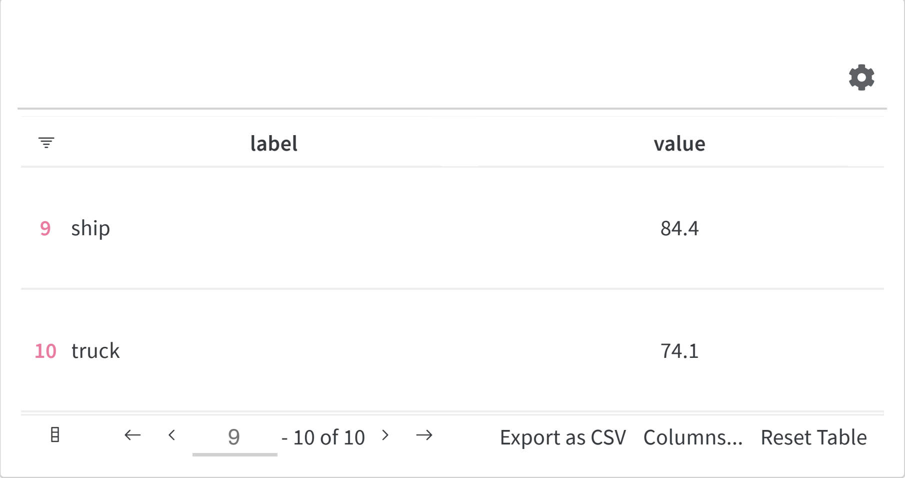


Parameter importance with respect to train/epoch

Search Parameters

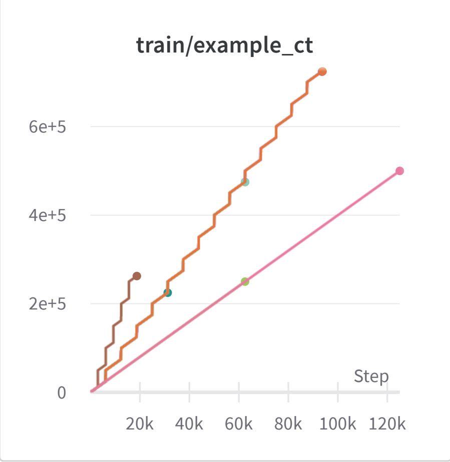
Config para…	Importance.	Correlati
lr		
epochs		

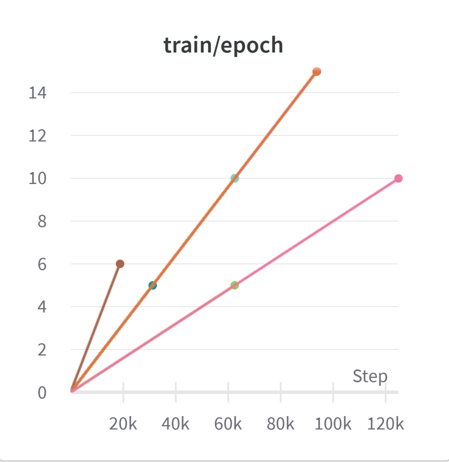


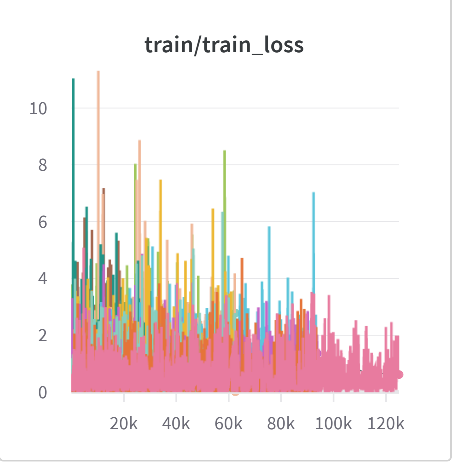


	label	value
9	ship	84.4
10	truck	74.1

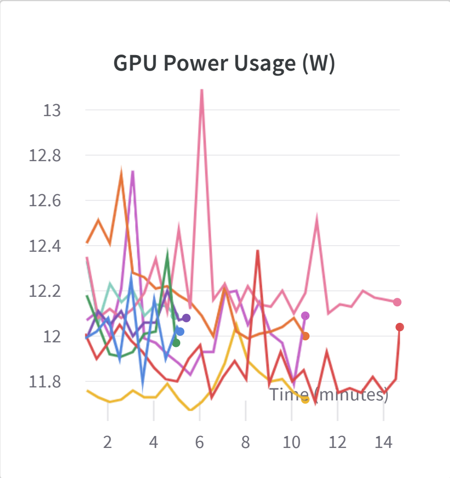
Training loss by iteration and epoch. Training loss for each of the parameters. Notice that each sweep has a different color and hovering over a particular name will highlight the associated result.

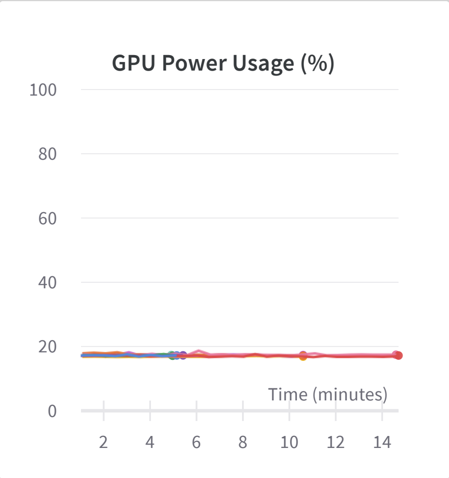


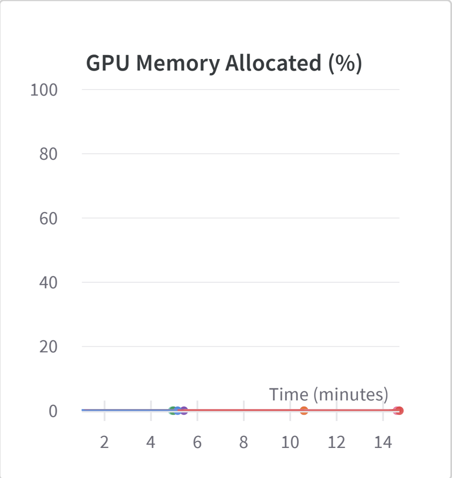


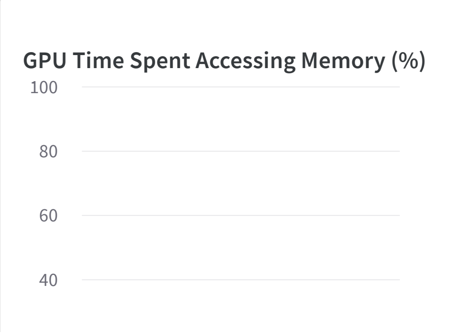


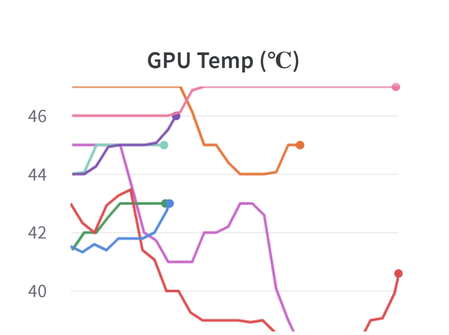
Power usage and memory for commodity GPU. This is important for optimizing and choosing hardware for on-prem or private cloud computing optimization.

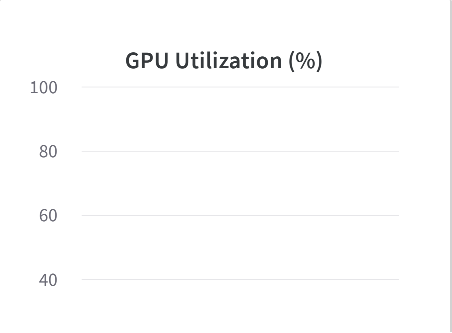


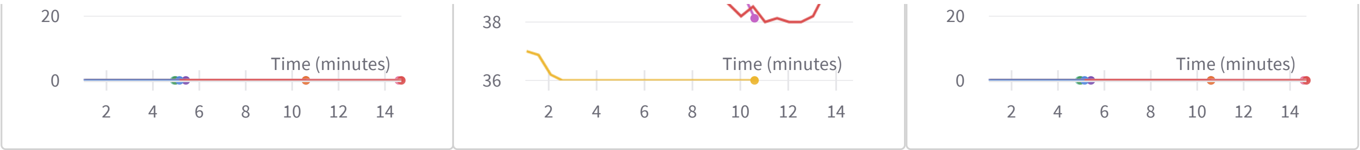




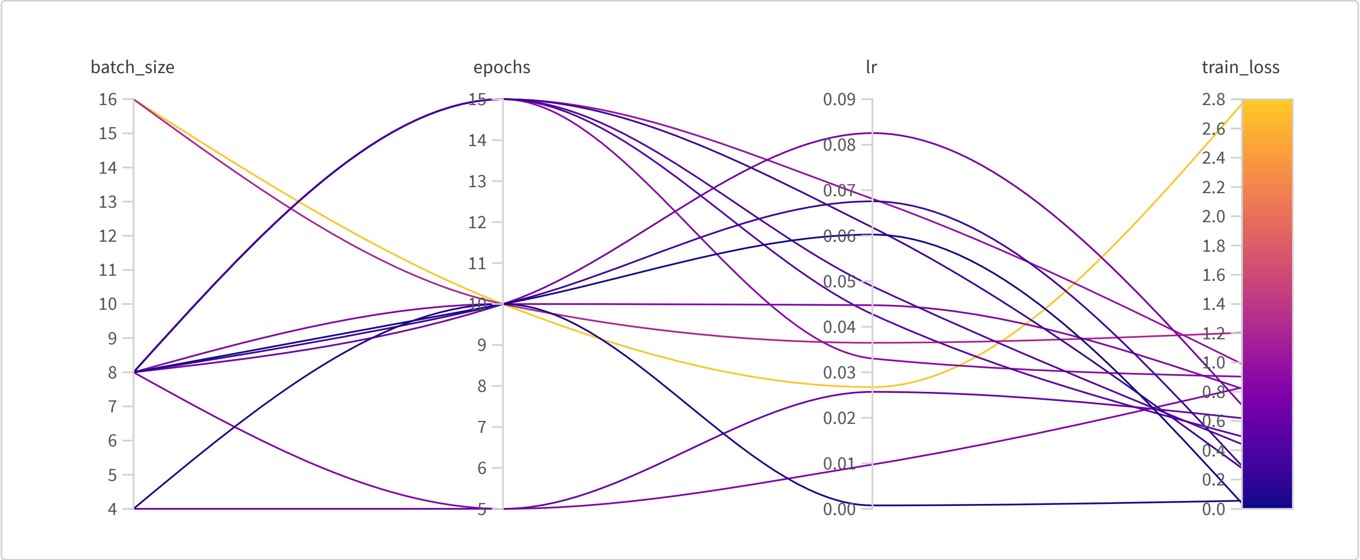








Below is an example of a hyper-parameter Sweep with Weights and Biases. Notice that the chosen tuning parameters (batch size, epochs and learning rate) are compared to training loss. The best samples will have for the most part the lowest training loss. See the collab notebook for full coding example.



To learn more about this tutorial and to view documentation for Weights and Bias, follow one of the links below.

References:

1. PyTorch Tutorial on Training a Classifier
2. Weights & Biases Documentation

Created with ❤️ on Weights & Biases.

https://wandb.ai/databotbox/CIFAR_CV_PyTorch_Example/reports/CIFAR-CV-PyTorch-Example-Results-Report--VmlldzozMTg3NjU2