

CPU vs GPU Analysis

The following code trains a model on the XOR dataset using the CPU and then using the GPU to train, and then outputs the training time taken.

```
[2]: import os

from school_project.models.cpu.cat_recognition import CatRecognitionModel as CPUModel
from school_project.models.gpu.cat_recognition import CatRecognitionModel as GPUModel

# Change to root directory of project
os.chdir(os.getcwd())

model = CPUModel(hidden_layers_shape=[100, 100],
                  train_dataset_size=209,
                  learning_rate=0.1,
                  use_relu=True)
model.create_model_values()
model.train(epoch_count=3_500)

print(f"CPU Training Time: {model.training_time}")

model = GPUModel(hidden_layers_shape=[100, 100],
                  train_dataset_size=209,
                  learning_rate=0.1,
                  use_relu=True)
model.create_model_values()
model.train(epoch_count=3_500)

print(f"GPU Training Time: {model.training_time}")
```

CPU Training Time: 160.45

GPU Training Time: 42.58

As shown above, the GPU is approximately three times faster at training the model than the CPU, showing how beneficial it is to utilise the parallel computations of the GPU