

# AdaNet Implementation and Results

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GitHub Repository

## 1 Dataset Description

For this implementation, we used the following datasets:

- **CIFAR-10:** A widely-used dataset consisting of 60,000 32x32 color images across 10 classes. The dataset is split into 50,000 training images and 10,000 test images.

## 2 Implementation Details

### 2.1 Setup and Environment

- **Language:** Python 3.6
- **Libraries:** tensorflow==1.13.1, tensorpack==0.9.1, scipy==1.2.1
- **Environment:** The environment was set up using a Conda environment with Python 3.6. Necessary dependencies were installed via `requirements.txt` from the repository.
- **Training Setup:** The code was modified to train the model on CPU. It takes approximately 30 minutes to run 1 epoch on Ryzen 9 5900HS. The available GPUs did not have the required compute capability. This won't run on Kaggle or Google Colab due to tensorflow 1.
- **Training Time for Given Weights :** This model was put on training for approximately 100 Hours.
- **Restarting Training :** Even if the training stops somehow, the code saves the weights for the last 10 checkpoints, and loads the latest one automatically on restarting
- **Testing the code :** You can test the code using the trained weights provided in the Google Drive link. The environment will be setup by the bash script automatically.

## 2.2 Model Training

The hyperparameters for the model include:

- Batch size: 100
- Learning rate: 0.001
- Number of epochs trained: 87

## 2.3 Errors Encountered

- The GPU available on my physical system is a GTX1650 Max-Q with 4GB of VRAM which is insufficient for the model to be trained on the GPU.
- Even after merging GPU memory with the swap, the current available NVIDIA Drivers do not support CUDA 10.0 and CuDNN 7.6. The resulting error is ***Failed to load convolution algorithm***
- So in all the files I had changed the device parameter from GPU:0 to CPU:0 for the training to take place.
- You can revert the changes if required compute is available

## 3 Results

The results of the experiments are summarized in the following tables and figures.

Dataset	Accuracy	Claimed Accuracy
CIFAR-10 (Test Seed 1)	87.24%	91.39%
CIFAR-10 (Test Seed 2)	87.23%	91.11%
CIFAR-10 (Test Seed 3)	87.18%	91.35%

Table 1: Model performance across different datasets.

The model demonstrates competitive performance on CIFAR-10 dataset and is within 5% error from the claimed results. The claimed accuracy was obtained by the authors of the paper using 2000 epochs. The current accuracy was obtained using only 87 epochs due to the compute constraint.