Classification

Performance Assessment

Loss Function: Cross-entropy loss

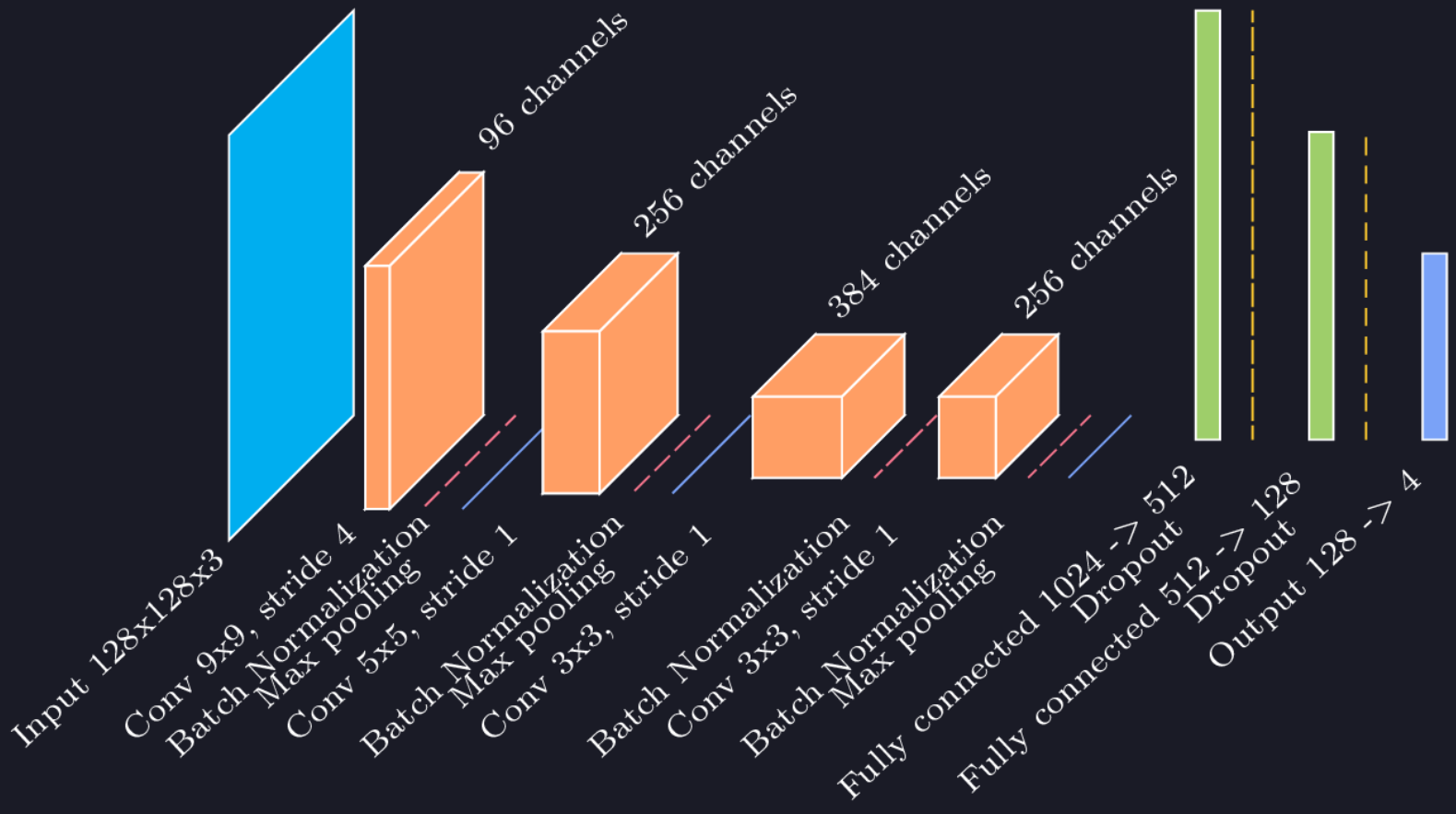
$$L(y, \hat{y}) = -\sum_i y_i \log(\hat{y}_i)$$

Accuracy: Number of correct predictions divided by the total number of predictions

Confidence: Given by the Softmax function applied to the net output

$$S(x_i) = \frac{e^{x_i}}{\sum_j e^{x_j}}$$

Custom CNN Architecture



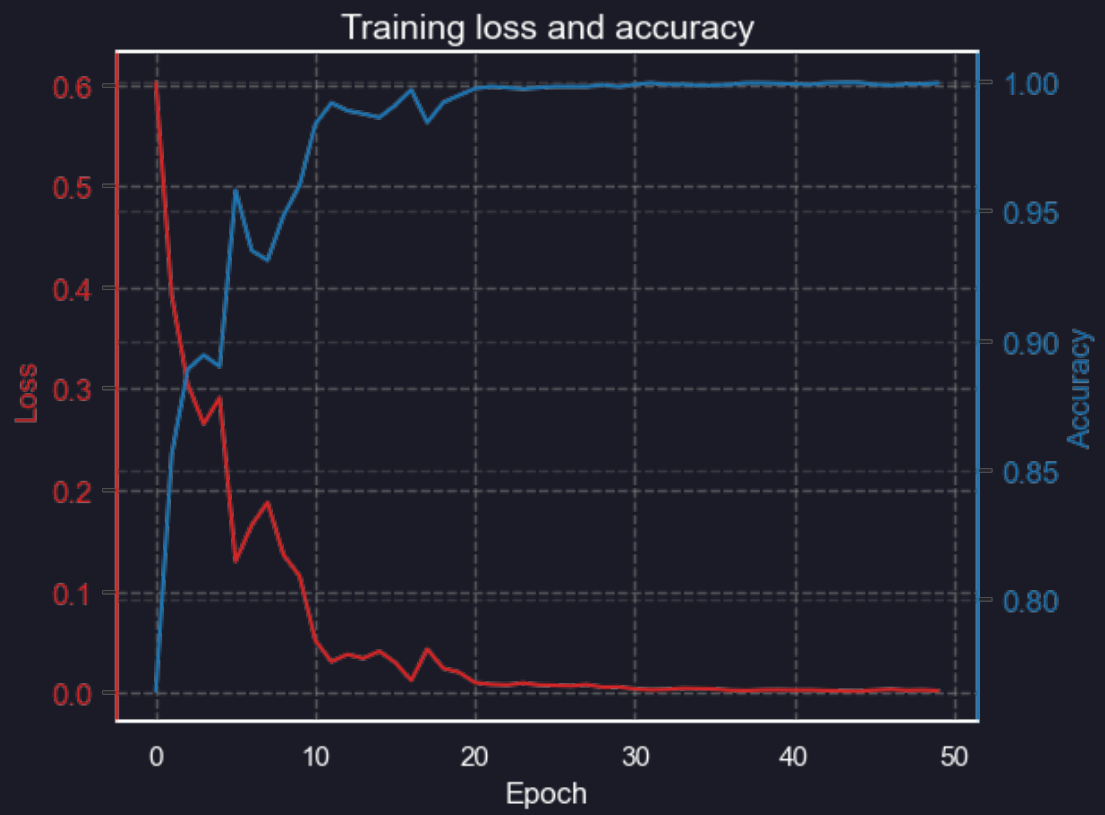
Number of parameters: 3001156

Training Details

Costum CNN model training parameters:

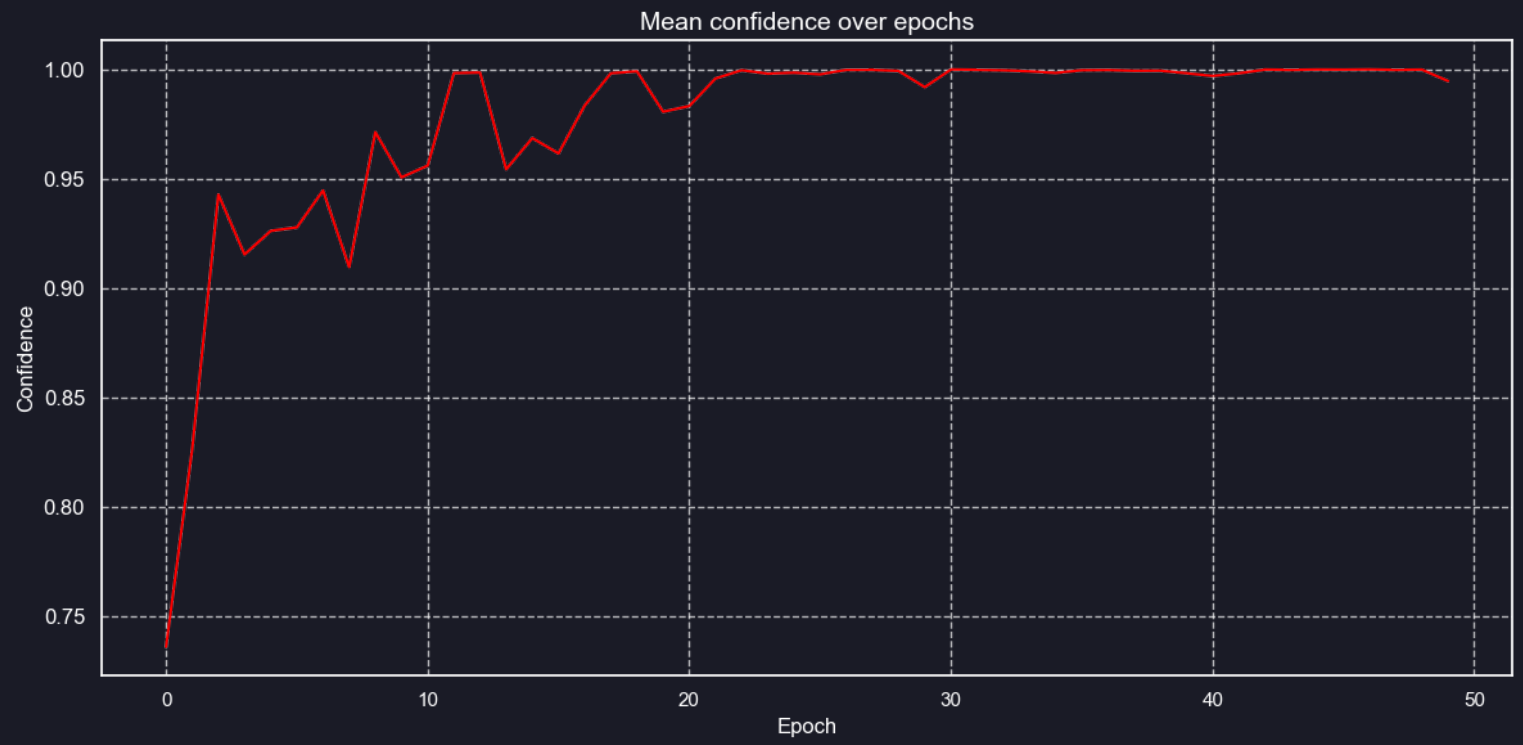
- **Epochs**: 50
- **Optimizer**: Adam (weight decay 1×10^{-5})
- **Scheduler**: stepLR (step size 10, gamma 0.5)
- **Loss function**: Cross-entropy
- **Learning rate**: 1×10^{-4}
- **Batch size**: 64 (both training and validation)
- **Activation function**: Mish
- **Dropout rate**: 0.4
- **Image size**: 128×128

Training Loss and Accuracy



- Final training loss: 1.4×10^{-3}
- Final training accuracy: 99.9%

Confidence and Test Accuracy



- Final training confidence: 99.9%
- Final test confidence: 99.9%
- Final test accuracy: 99%