

IMPLEMENTATION OF DB1

The first dataset of the Ninapro database (DB1) contains data collected from 27 subjects performing a wide range of hand movements. The main objective of this dataset is to support the development and evaluation of myoelectric control algorithms for prosthetic devices.

Compilation

The model is compiled with:

Optimizer: Adam, an adaptive learning rate optimization algorithm that's popular due to its efficiency and good performance.

Loss Function: Binary Crossentropy, suitable for binary classification tasks.

Metrics: Accuracy, to monitor the fraction of correctly classified samples.

Novelty

Dropout Regularization:

- The use of dropout layers with a 30% rate is a common and effective technique to mitigate overfitting, especially in deeper networks. By randomly dropping units during training, the model becomes less likely to rely on specific neurons, which promotes more robust learning patterns.

Deep Architecture:

- This model utilizes three hidden layers with a progressively decreasing number of neurons (256, 128, 64). This architecture is beneficial for capturing complex patterns in data. Each layer is followed by a dropout layer to regularize the network.

ReLU Activation:

- The choice of ReLU activation functions in the hidden layers is standard in deep learning due to its ability to mitigate the vanishing gradient problem and accelerate convergence.

Sigmoid Activation in Output Layer:

- The sigmoid activation function in the output layer is suitable for binary classification, providing a probabilistic interpretation of the model's predictions.