Long Short-Term Memory (LSTM) Demonstration

Soft Computing (SFC) project

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LSTM in theory

- type of Recurrent Neural Network
- designed to mitigate the **vanishing gradient** problem
  - Memory cells
  - Gates (input, output, forget)

Application:

- **Natural Language Processing (NLP)**
  - text generation
  - machine translation
- **Time Series Prediction**

Task for the project = sequence prediction

Project Overview

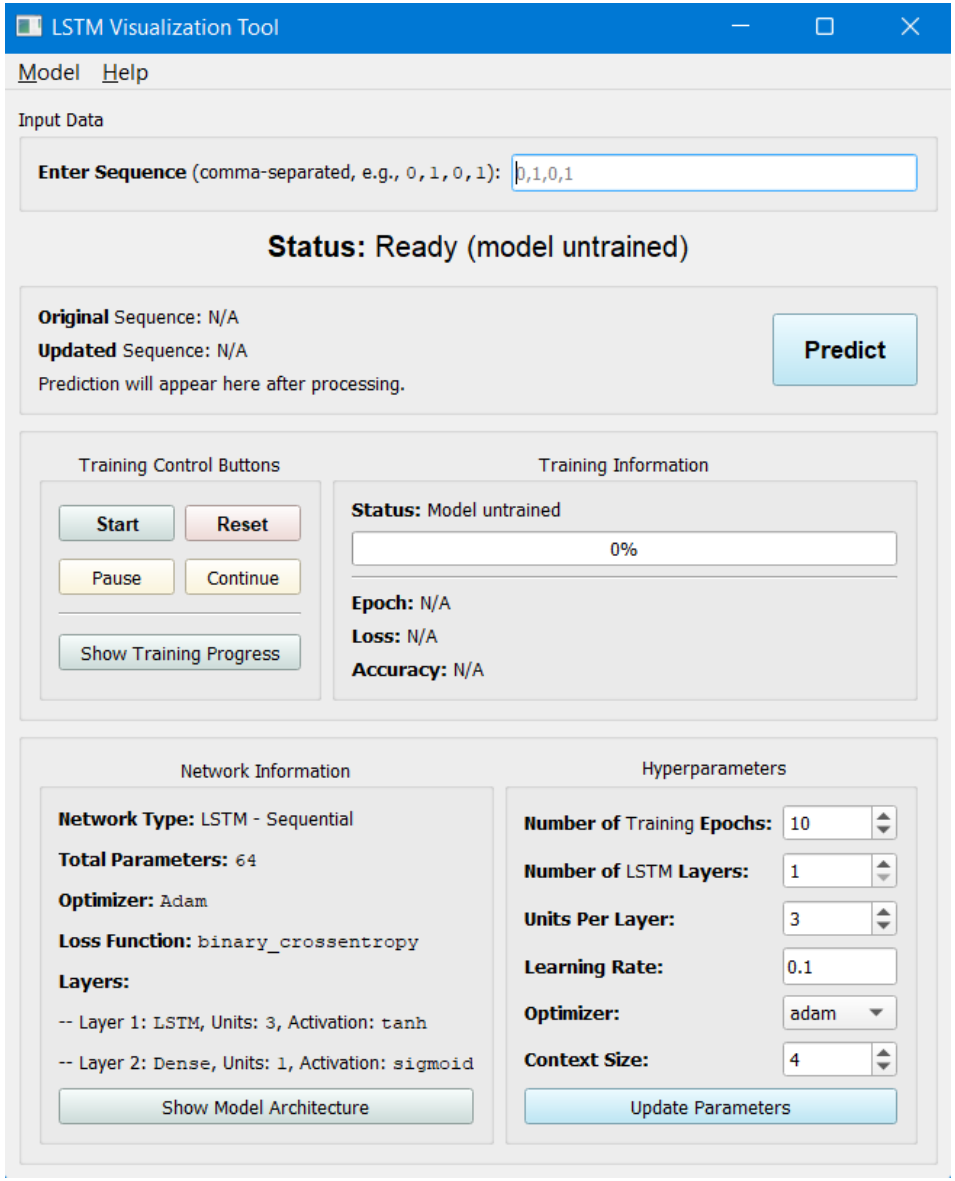
Task for the LSTM

- sequence prediction
- next symbol in a sequence of 1s and 0s:
  - e.g. **1,0,1,0**,1,0,1,0 … → **1,0,1,0,**1,0,1,0, …

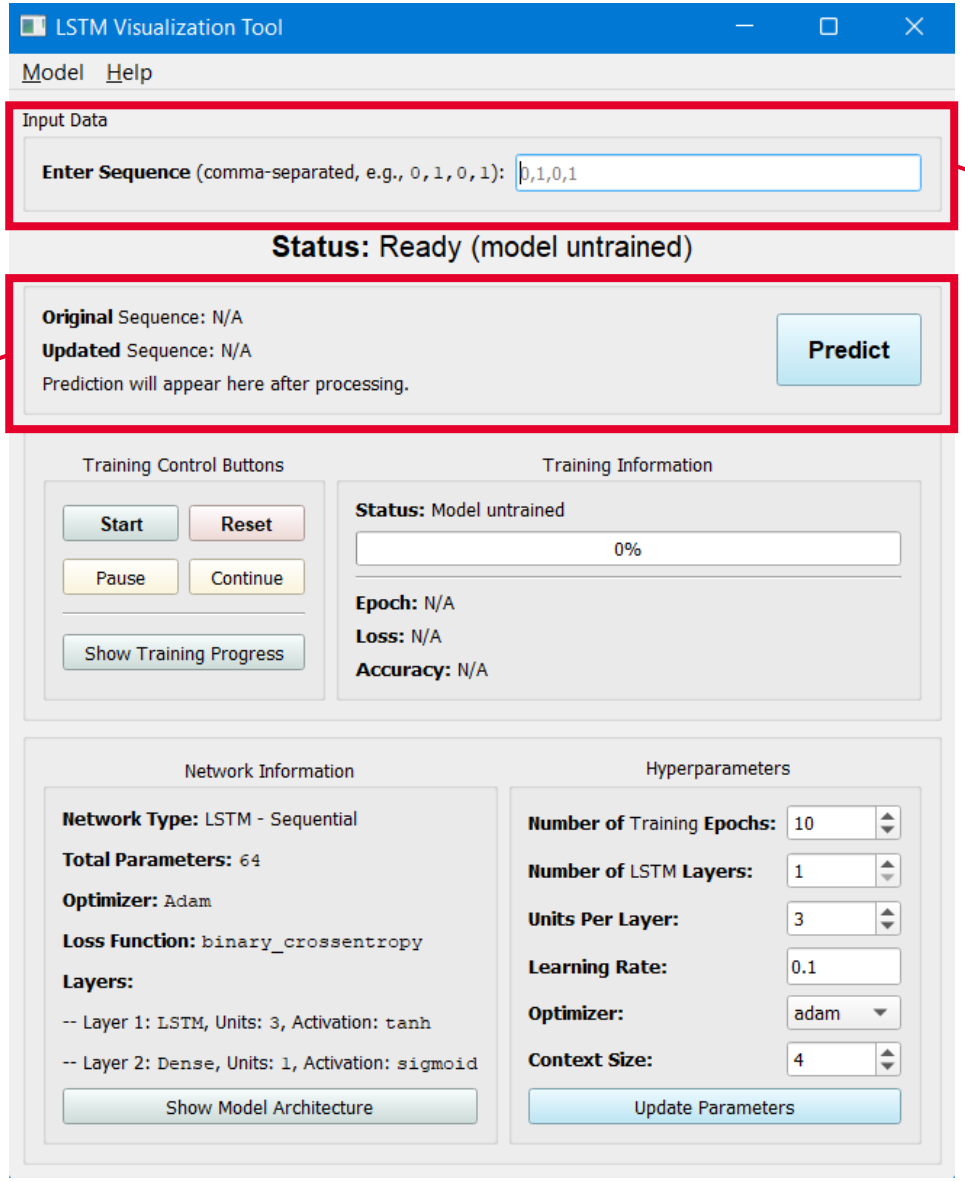
Software

- Python + PyQt (numpy, matplotlib)
- TensorFlow (Keras LSTM model)

Application GUI



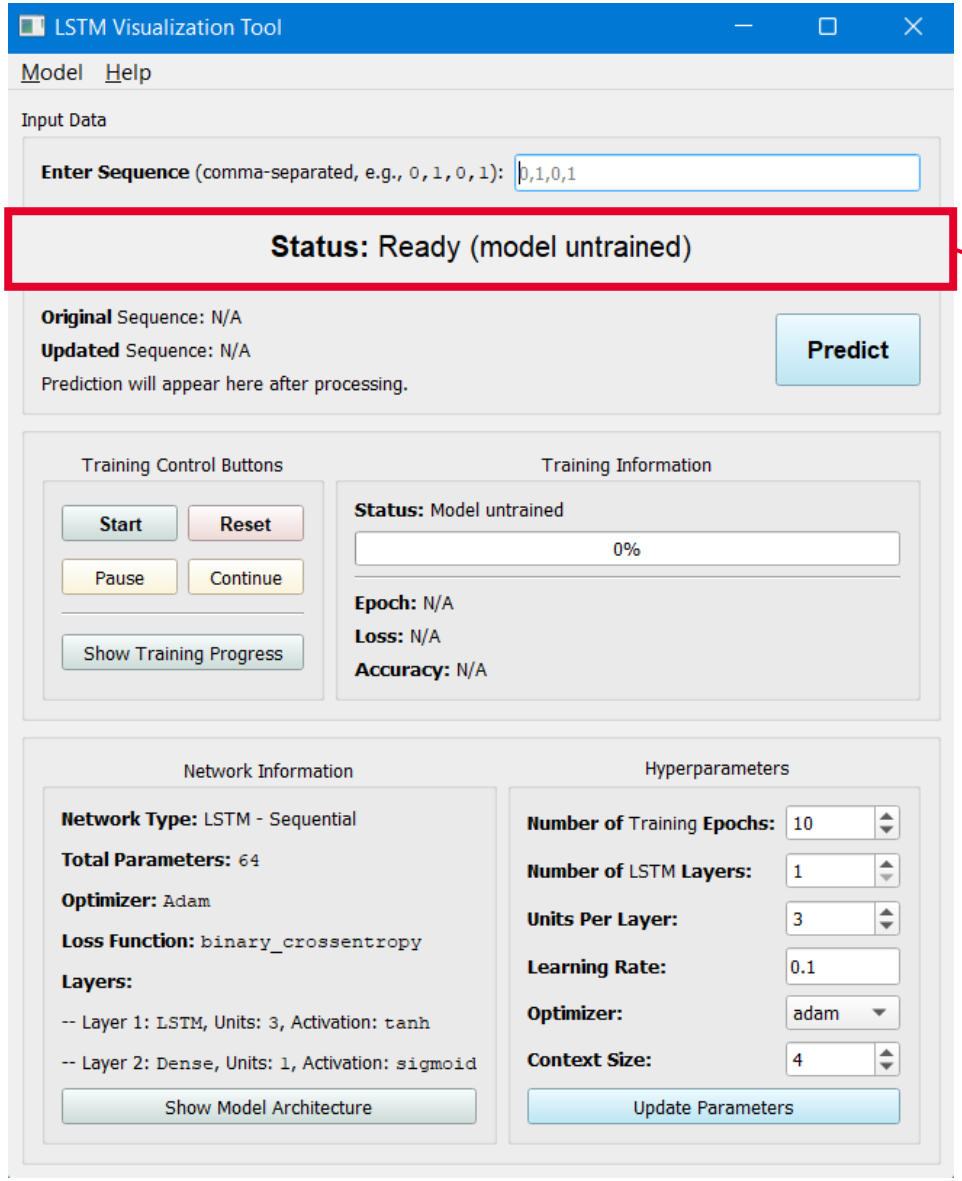
Application GUI



input sequence

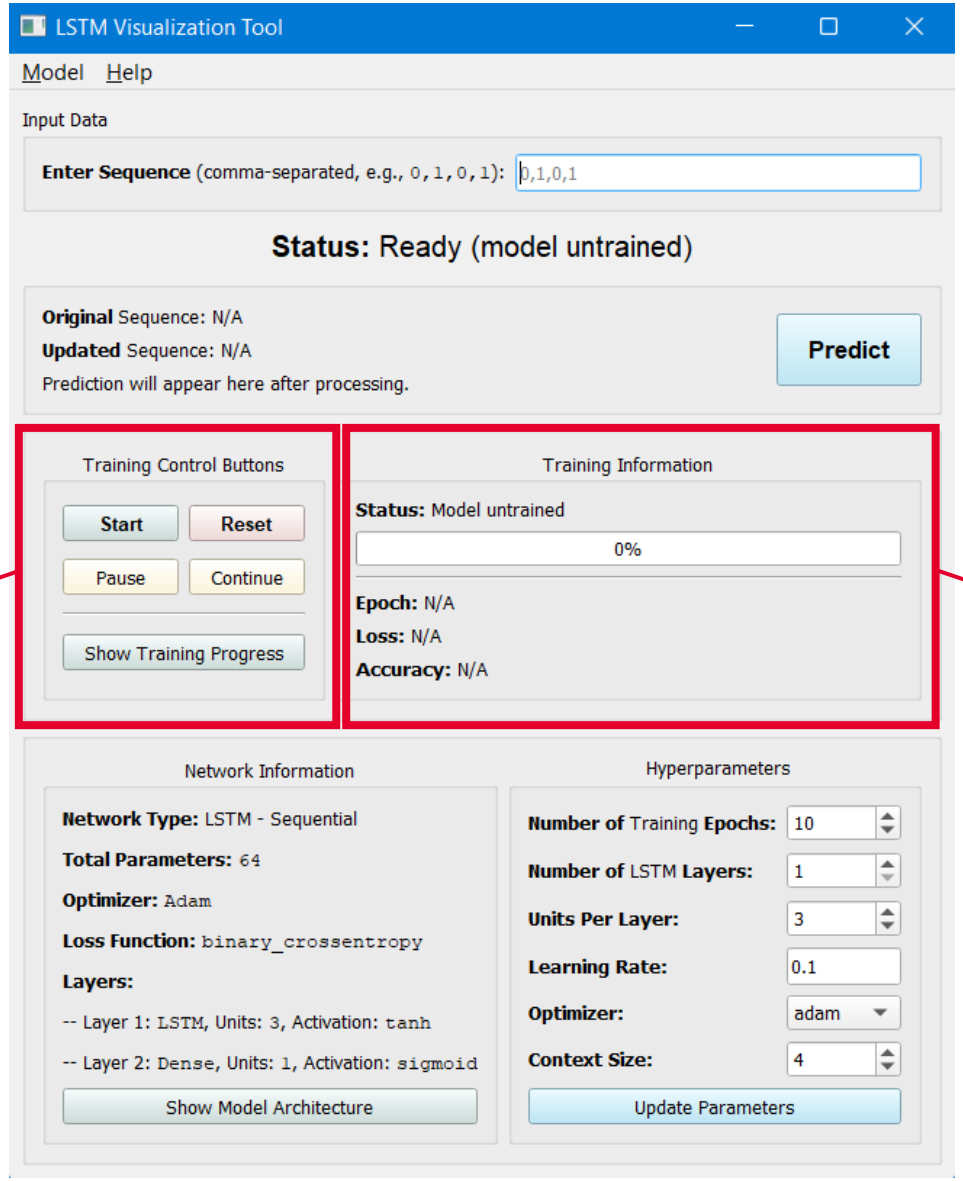
output section

Application GUI



App status

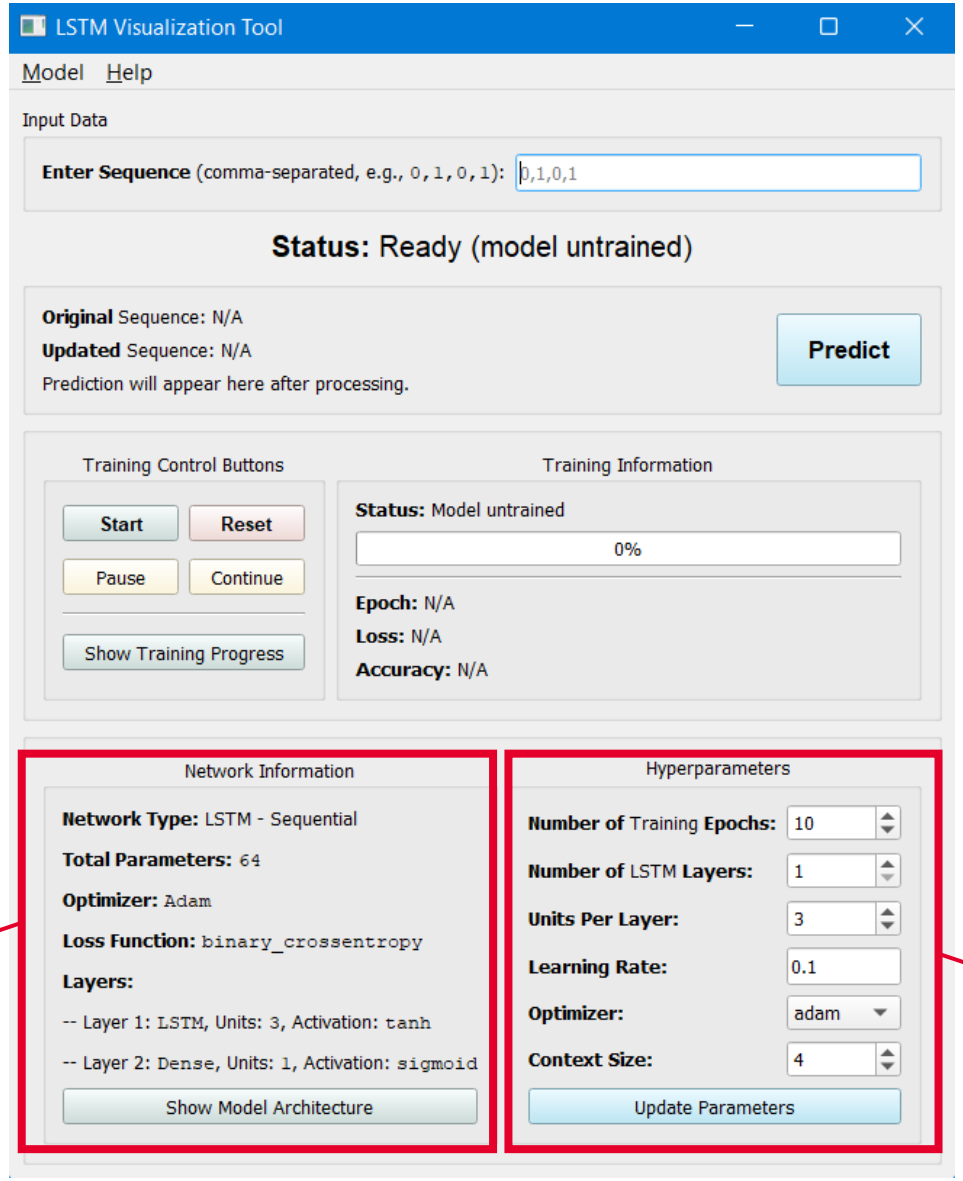
Application GUI



Control Buttons

Training information

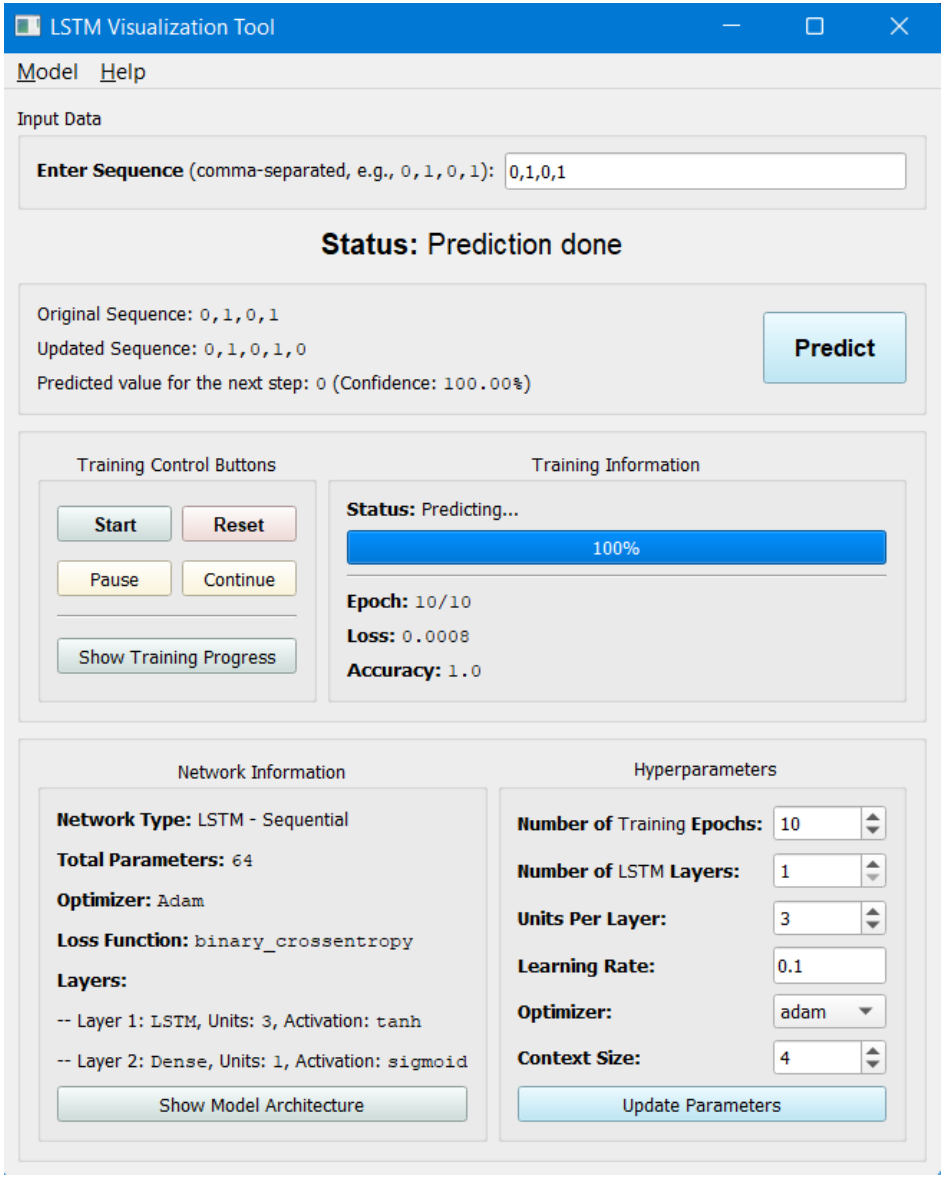
Application GUI



Network info

Hyperparam. setting

Application



Application