

Research Objective

Find a method to optimize the running time and memory consumption of a machine running the Developmental Network (DN) while maintaining a high accuracy.

Introduction

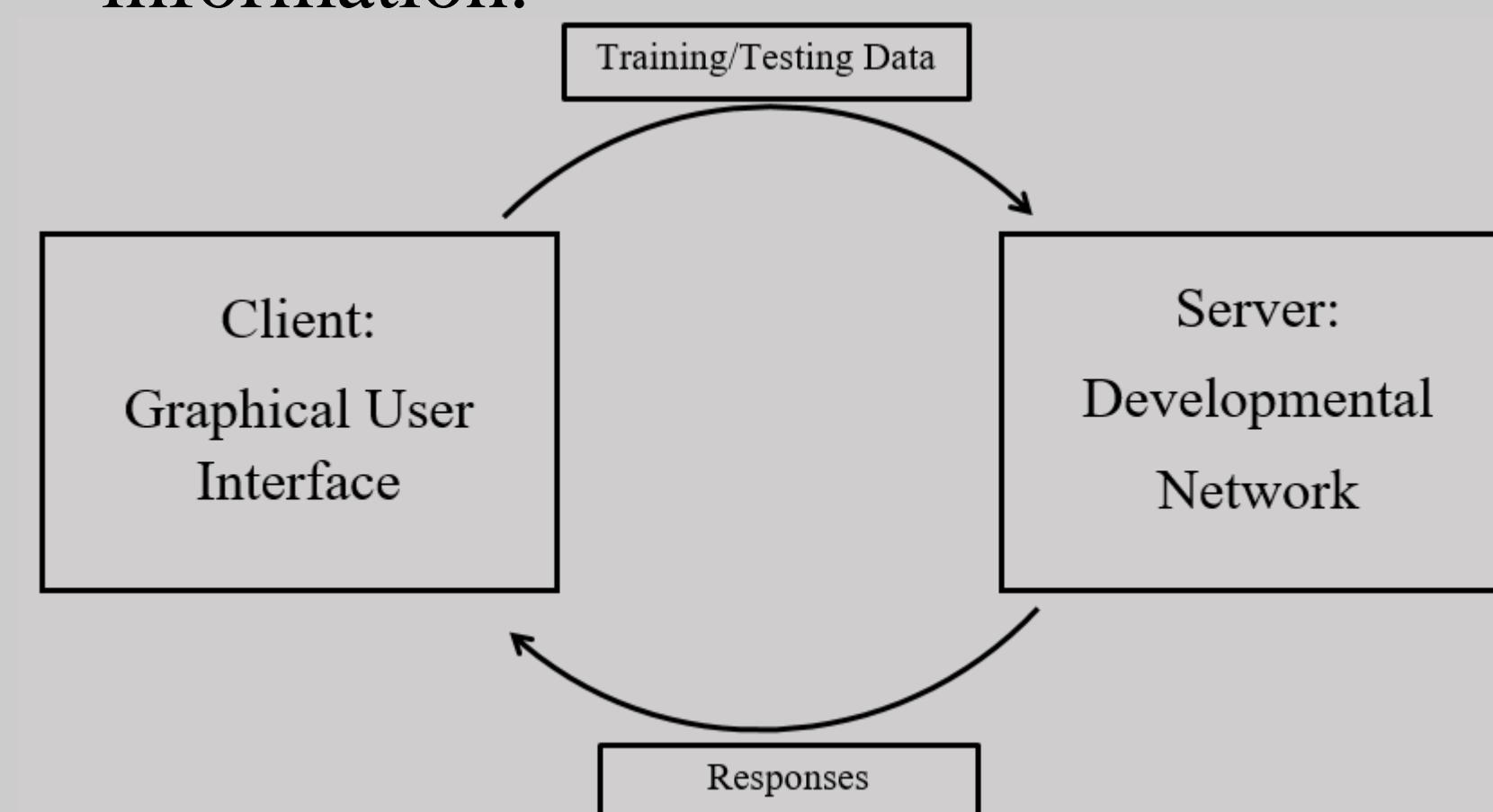
- Artificial Intelligence (AI) has become an important area for the scientific community over the last century.
- The DN is a new AI method developed by Dr. Weng in 2012.
- AI methods show great results, many still face similar limitations.
- These issues include long periods of running time, large amounts of data required for training, and high memory consumption.
- Many AI methods have their own specialized way to overcome their limitations.

Objectives

- Monitor the running time, memory consumption, and accuracy of DN while performing a task.
- Find the best fitting number of neurons to optimize the running time and memory consumption while being ran on a particular machine.
- Display statistics found in a graph for the user to determine the best fitting number of neurons for the assigned task.

Methods

- Develop a Graphical User Interface to monitor the running time and memory consumption of a machine running the DN.
- Establish a client to server connection between the GUI and DN to send information.



- Select a task for the DN to accomplish and have the GUI record running time and memory consumption.
- Run multiple iterations of the same task with different amount of neurons.
- Analyze the graphs to help determine the best fitting amount of neurons for the task given.

Procedure

- Initialize the DN for the task assigned.
- Select the training or testing file to upload to GUI.
- Test connection between GUI and DN.
- Run the program using the GUI.
- Repeat steps 1-4 with different amount of neurons until accuracy of the DN is below a desired accuracy threshold.
- Determine the best fitting amount of neurons for given task.

Expected Results

GUI OUTPUT

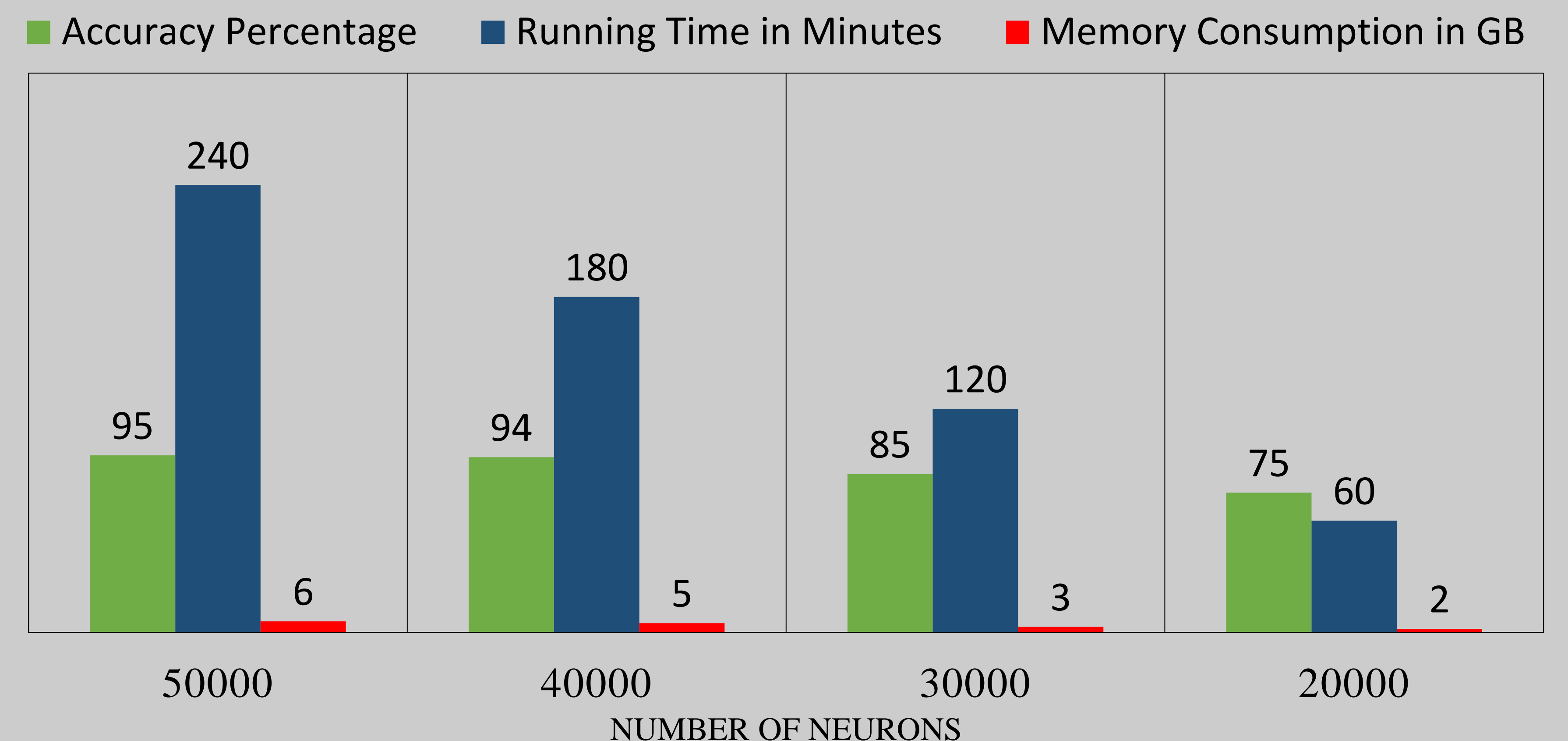


Fig. 1. Expected data after running multiple iterations and then graphing it.

GUI Design

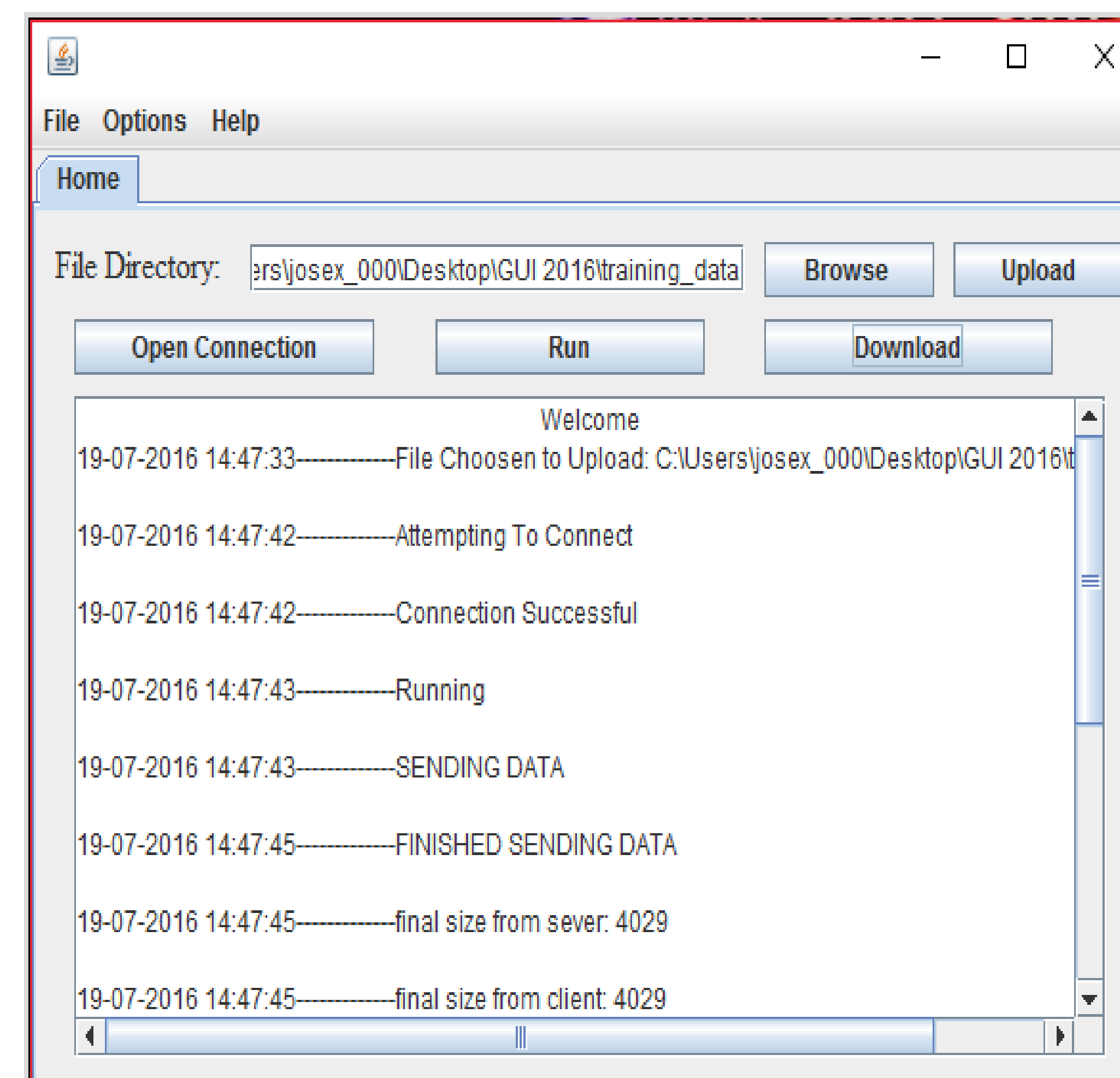


Fig. 2. Utilization of GUI.

Future Work

- Run these procedures with different tasks.
- Find other methods to optimize the running time and memory consumption.
- Have the DN autonomously reduce the number of neurons to use when running.
- Find new capabilities of the DN.

References

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