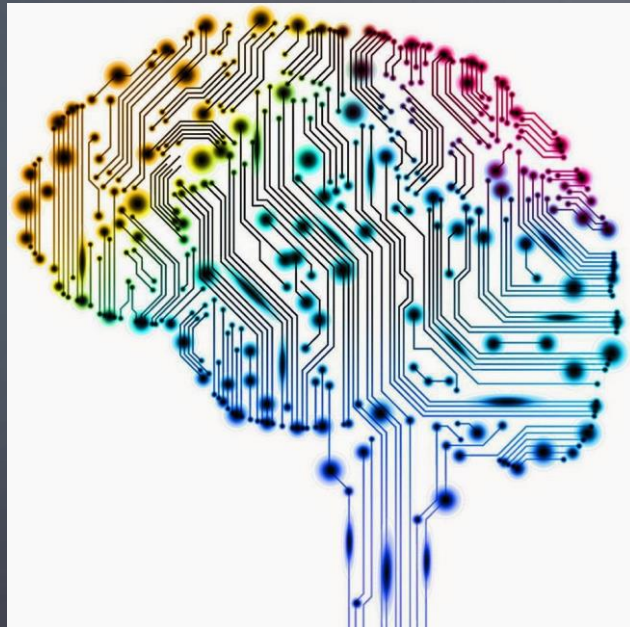


# Performance Analysis User Interface for Modality- Independent Developmental Network (DN)

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# Artificial Intelligence

- The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.



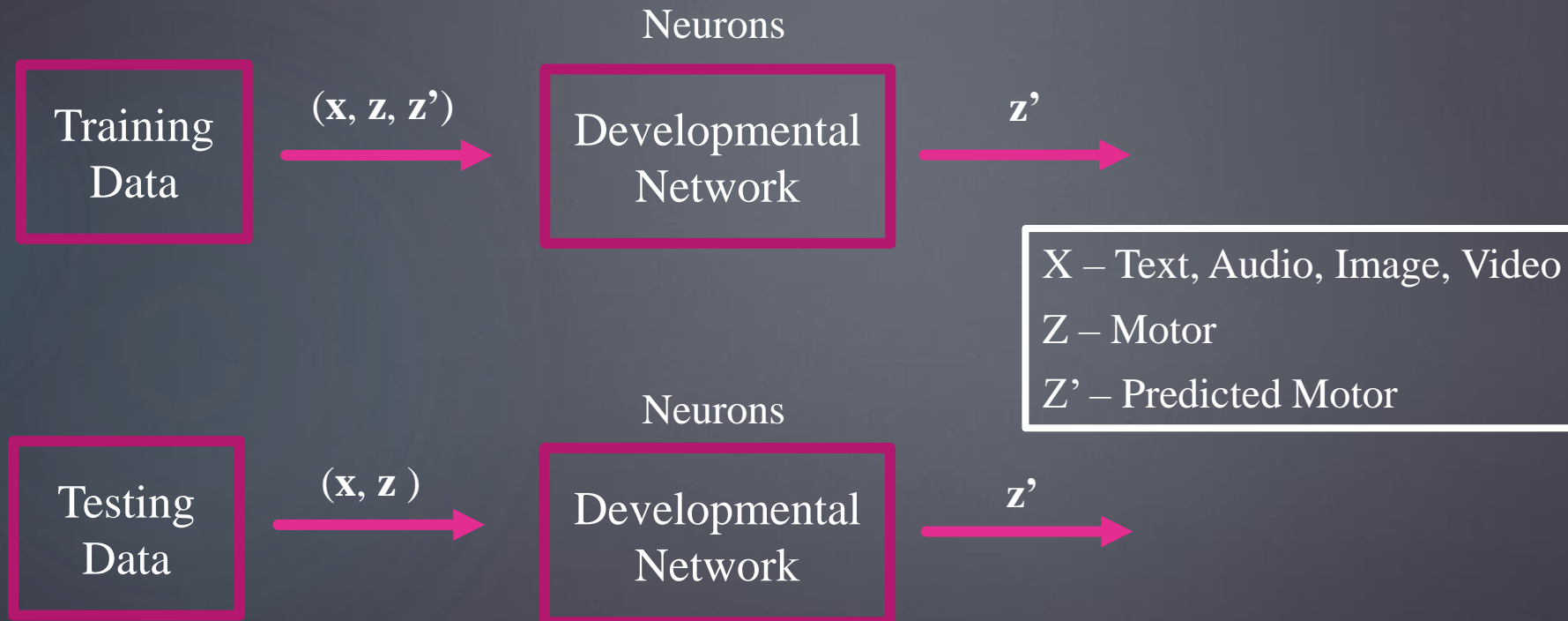
# Research Objective

- Find a method to optimize the running time and memory consumption of a machine running the DN while solving a task and maintaining high accuracy.



# Developmental Network (DN)

- ▶ Dr. Weng designed the Developmental Network in 2012
- ▶ Neuron – Information processing unit of a Neural Network. The neurons receives one or more input and sums them to produce an output.



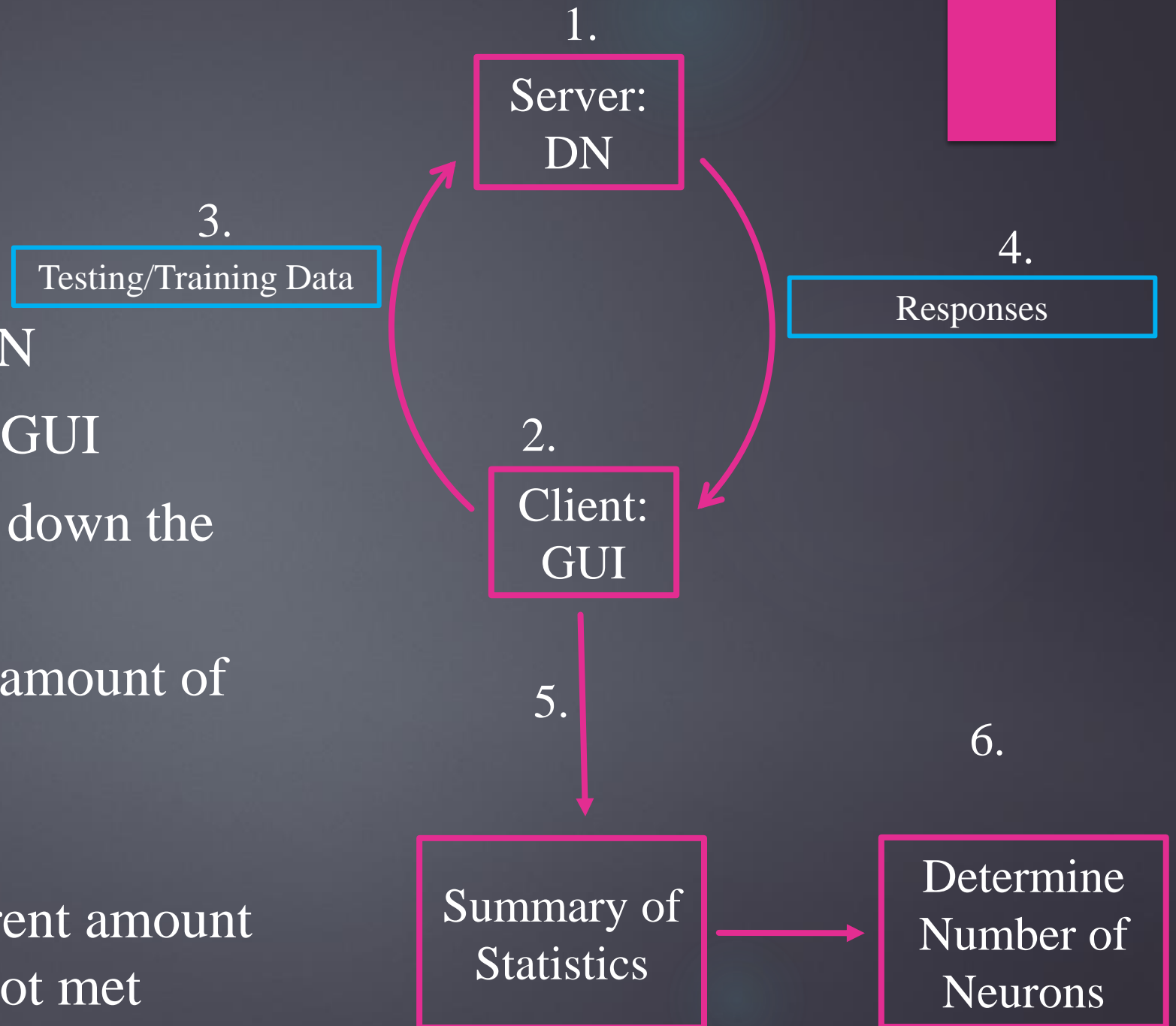
# Goals

- ▶ Develop a Graphical User Interface (GUI) to monitor the running time, memory consumption, and accuracy while the DN is running on a machine.
- ▶ Establish a client to server connection between the GUI and DN to send information.
- ▶ Select task for DN to accomplish.
- ▶ Run multiple iteration of the same task with different amount of neurons.
- ▶ Analyze the graphs to determine the best fitting amount of neurons.

# Procedure

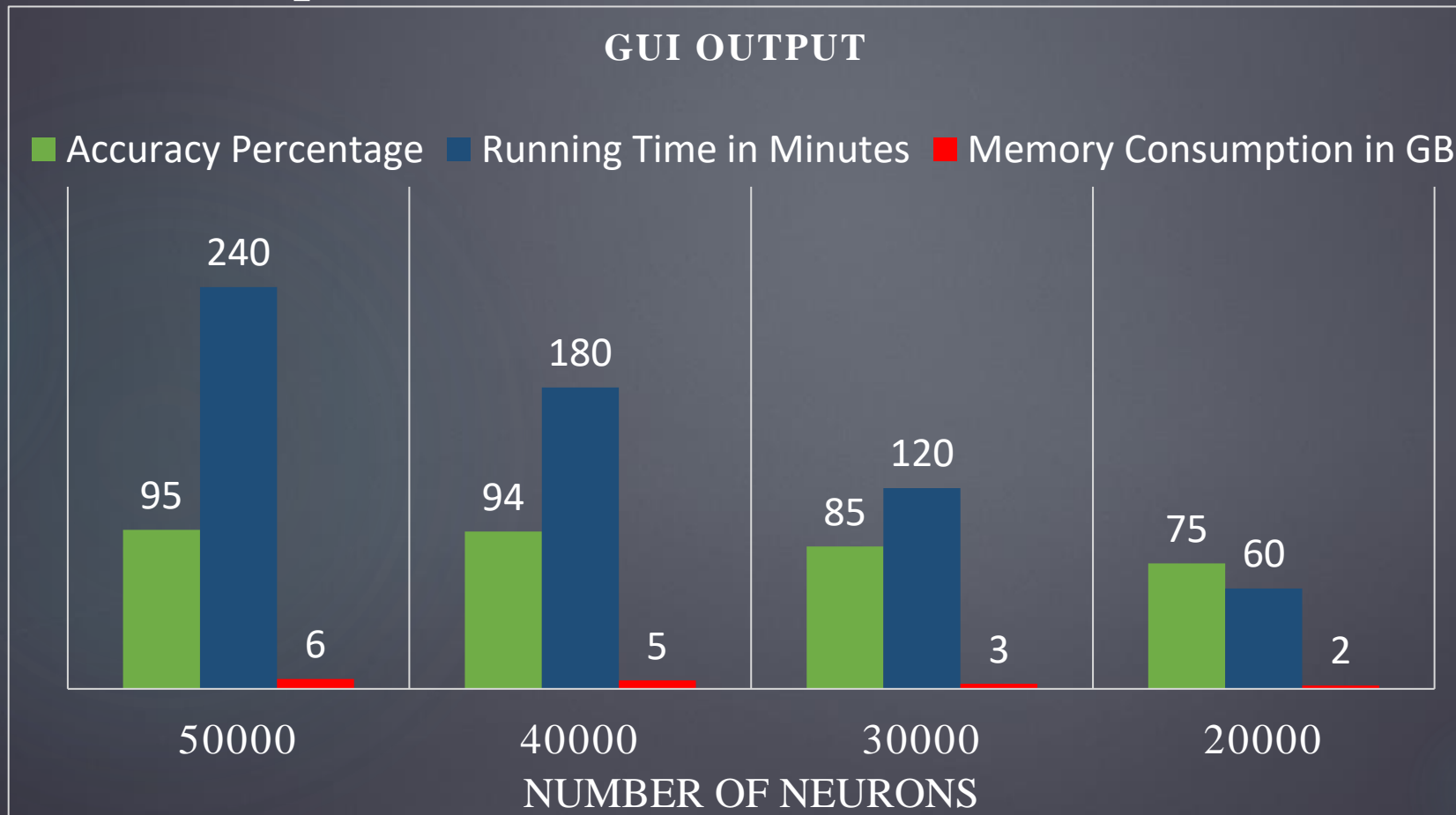
1. Initialize the DN
2. Open the GUI
3. Select data to be sent to DN
4. DN sends its responses to GUI
5. GUI will record and write down the statistics
6. Determine the best fitting amount of neurons for given task

\*Repeat steps 1- 4 with different amount of neurons until accuracy is not met



# Expected Results

- We expect to see a decrease in running time and memory consumption with the reduction of neurons.



- An accuracy less than 80% is unacceptable.



# Societal Implication

- ▶ By optimizing running time and memory consumption, the DN can learn efficiently.
- ▶ Add to the field of computer vision and object recognition.
- ▶ Current research on text and audio inputs being implemented.



# 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.

# Acknowledgements

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# QUESTIONS?

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