

# **Software Development Project**

## **Functional Requirements Document**

### **Team Members**

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Version	Description of Change	Author	Date
1,0	Adding requirements	Jaswanth Bandlamudi	20/10/2019

## INTRODUCTION

This system monitors activation during the inference phase and judges whether the decision is reliable or not.

### 1.1 Purpose

The Purpose of this system is to judge the reliability of the Neural Network trained to classify an image out of the training set.

### 1.2 Scope

The scope of the system is to visualize the activations during training and inference and make a decision

### 1.3 Background

For using neural networks in safety critical domains, it is important to know if a decision made by a neural network is supported by prior similarities in training. After the standard training process, one creates a monitor by feeding the training data to the network again in order to store the neuron activation patterns in abstract form. In operation, a classification decision over an input is further improved by examining if a pattern similar to the generated pattern is contained in the monitor. If the monitor does not contain any pattern similar to the generated pattern, it raises a warning that the decision is not based on the training data.

### 1.4 References

[Runtime Monitoring Neuron Activation Patterns](#)

# 1 FUNCTIONAL REQUIREMENTS

## Context diagram

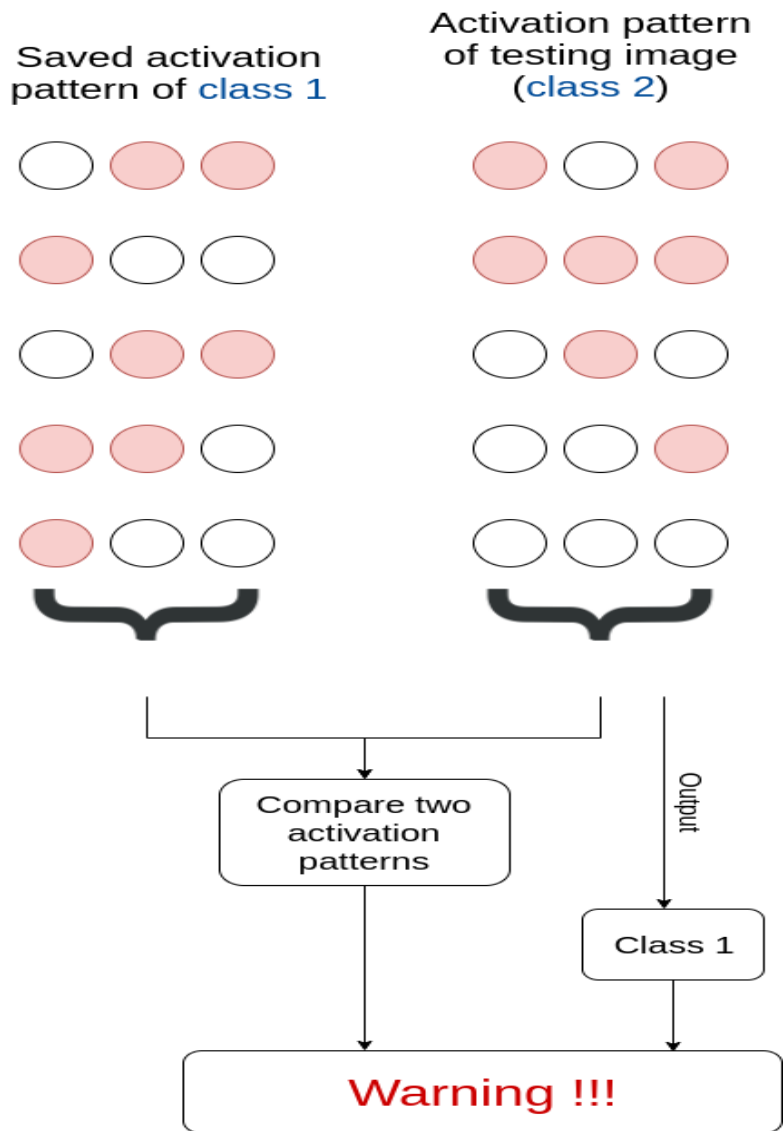


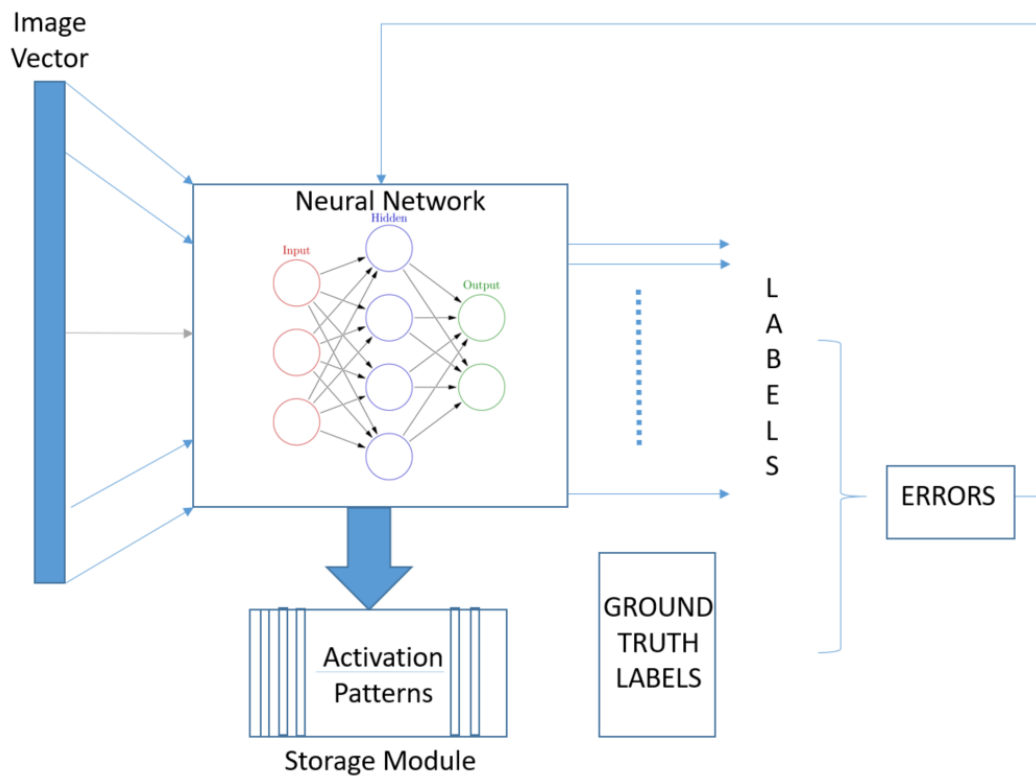
Exhibit 2 - Generic Context Diagram

## User Requirements

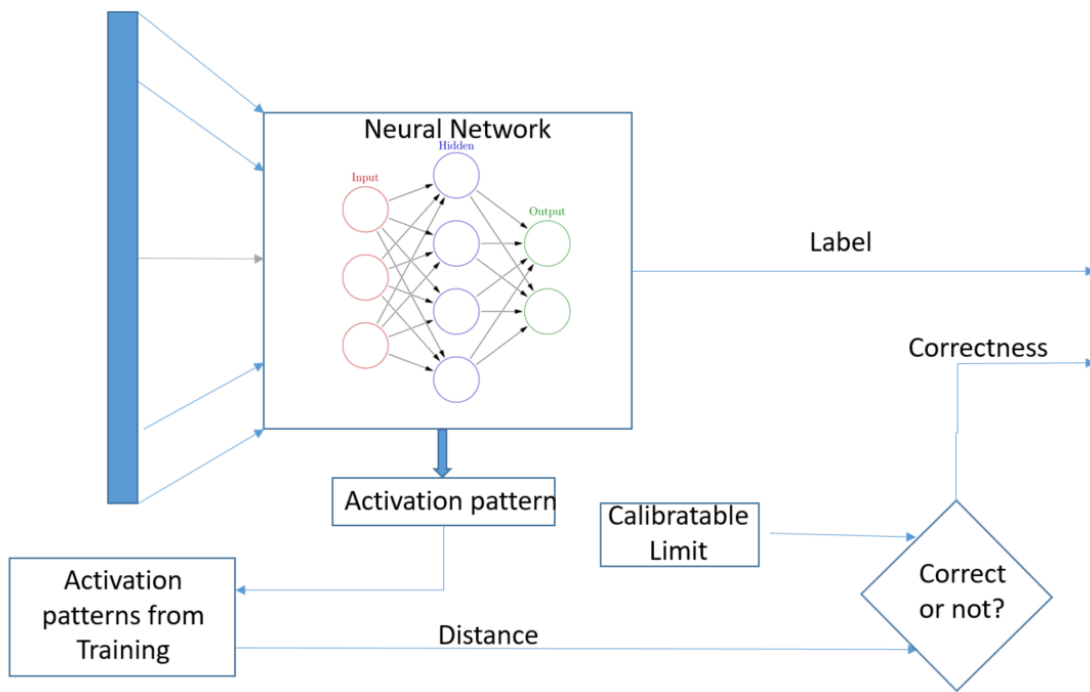
1. The system shall have a Neural network for classification purpose
2. The system shall be trainable.
3. The system shall take images as its inputs
4. The system shall have a data structure which stores the activation patterns during training.
5. The data structure chose shall be useful in calculating the norm/distance with another such data structure
6. The system shall have a subsystem which is able to visualize the activation patterns during both training and inference phase.
7. The system shall have a decision making ability to decide whether the classification is reliable or not.

## Data Flow Diagrams

During Training:



During Inference



## **APPENDIX A - GLOSSARY**

[Define terms, acronyms, and abbreviations used in the FRD.]