Python Defect Predictor

Demo – 29 Oct 2021

sogeti
Part of Capgemini

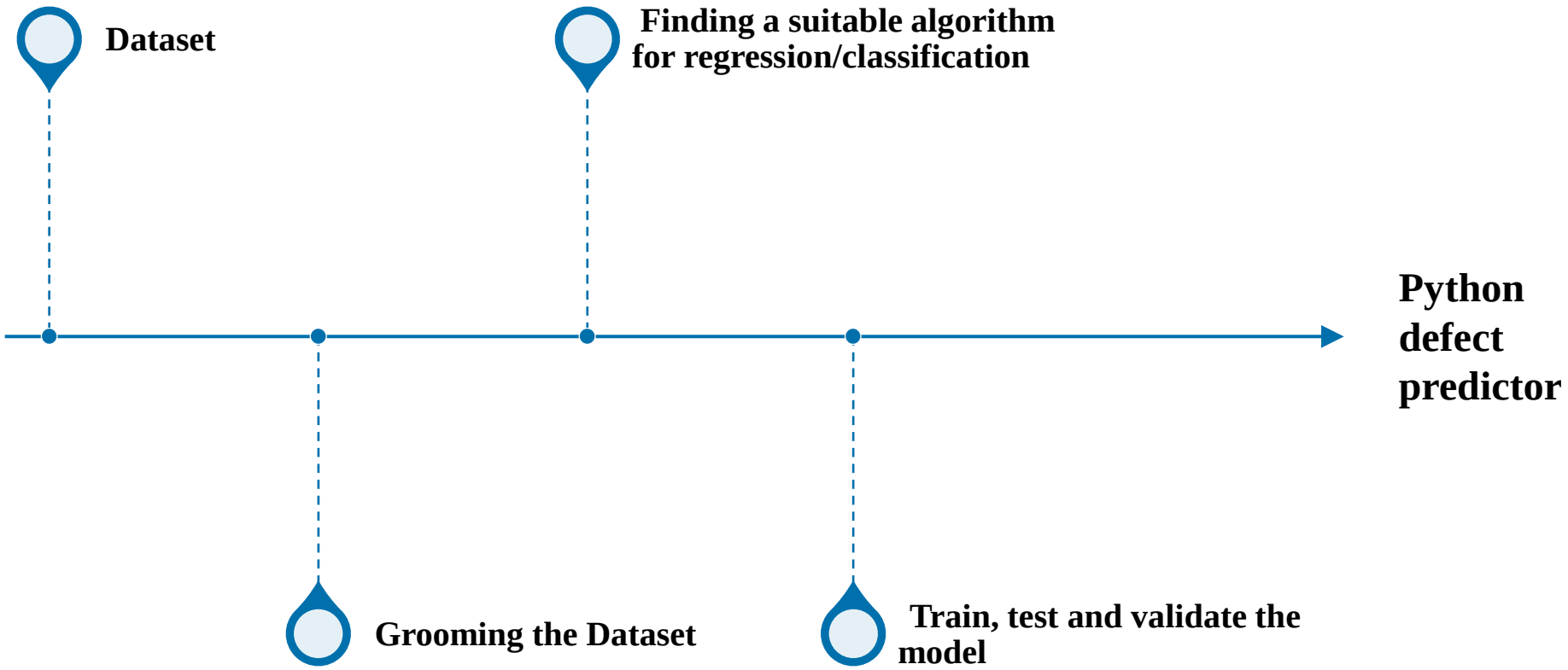
Agenda

- Problem Statement
- Planning
- Python Predictor
  - Wine quality predictor using logistical regression (Hrishikesh/Sai).
  - Wafer defect predictor using image classification (Vibhav).
- Conclusion/Reflections

Problem Statement

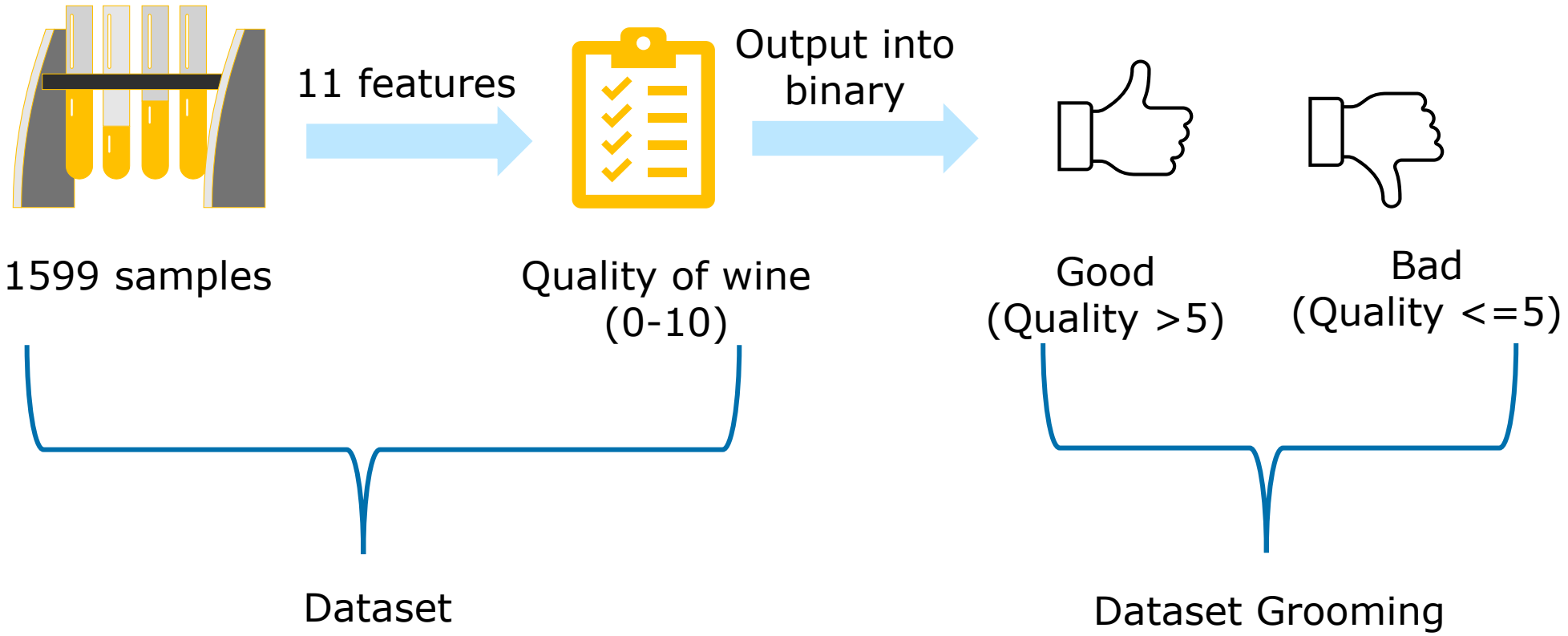
Defect prediction which can differentiate between levels of defects with an accuracy indicator.

Planning



Wine Quality Predictor using Logistical regression

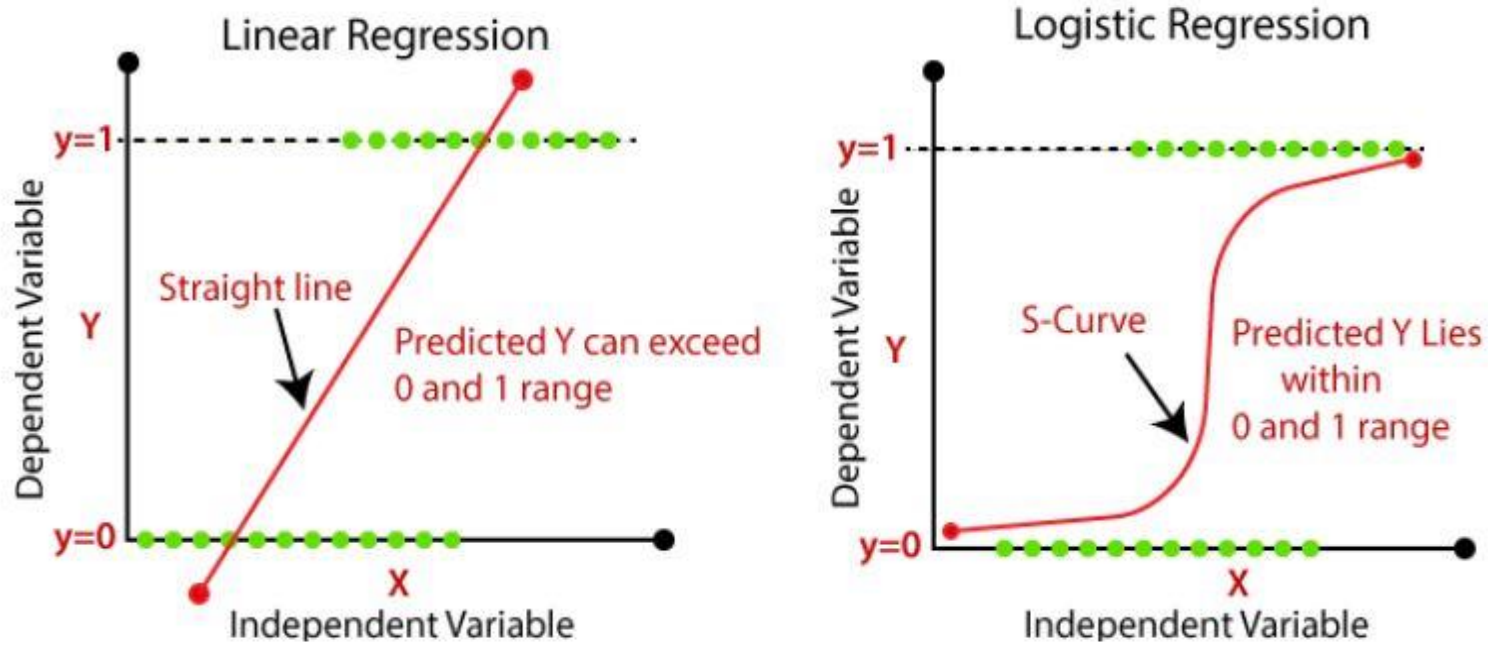
Aim: Predict the quality of white wine



- https://www.kaggle.com/piyushagni5/white-wine-quality

Wine Quality Predictor using Logistical Regression

ML Algorithm

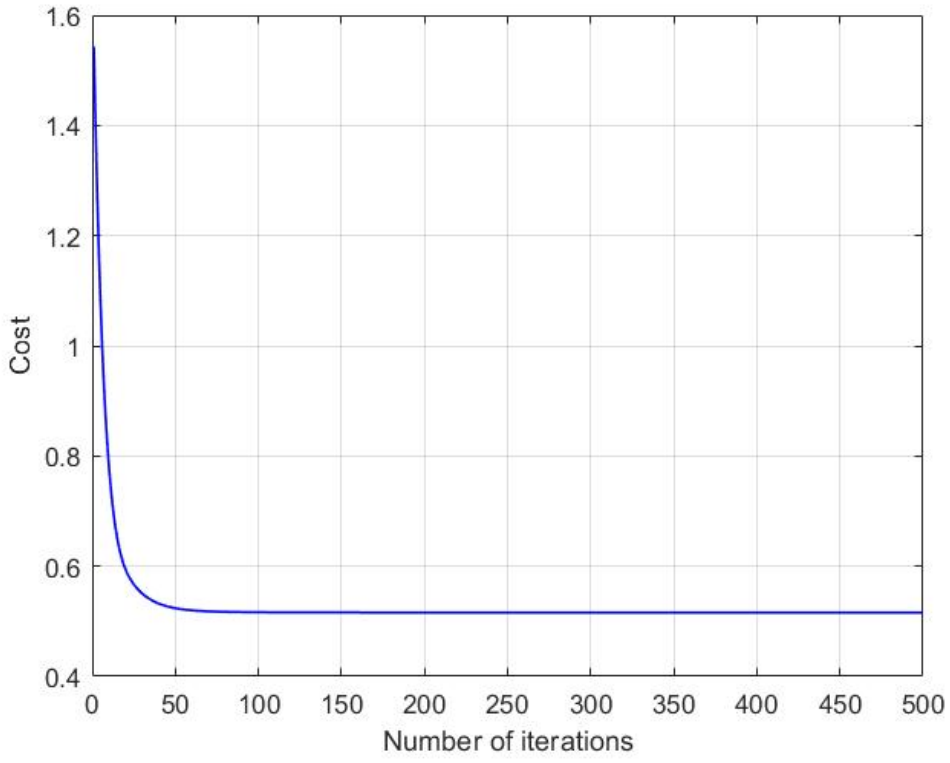


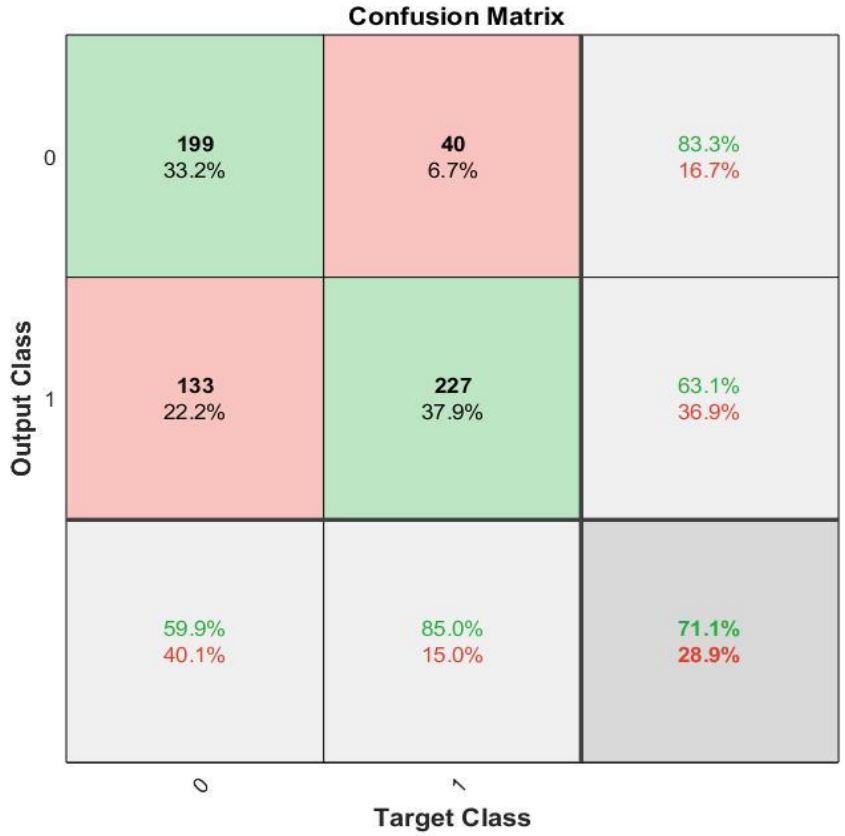
Wine Quality Predictor using Logistical Regression

DEMO

Wine Quality Predictor using Logistical Regression

Cost function and Confusion Matrix

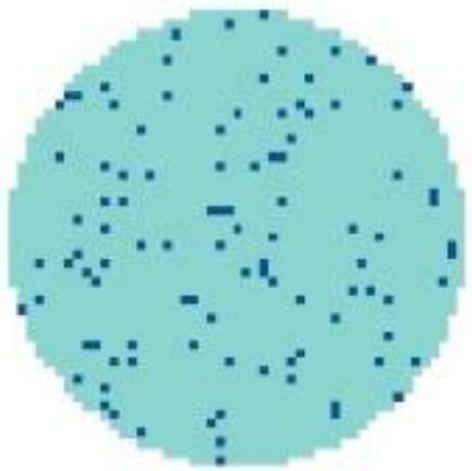




Wafer defect predictor using image classification

Aim: Identify the defect on the wafer map

Wafer Map Datasets

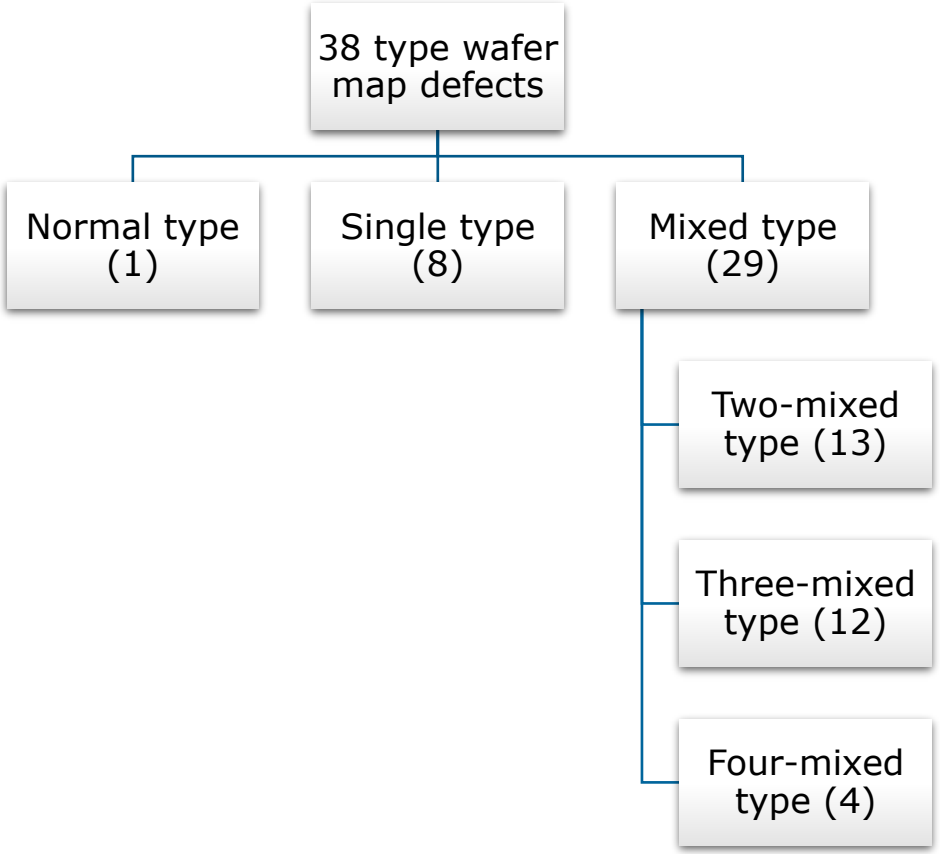


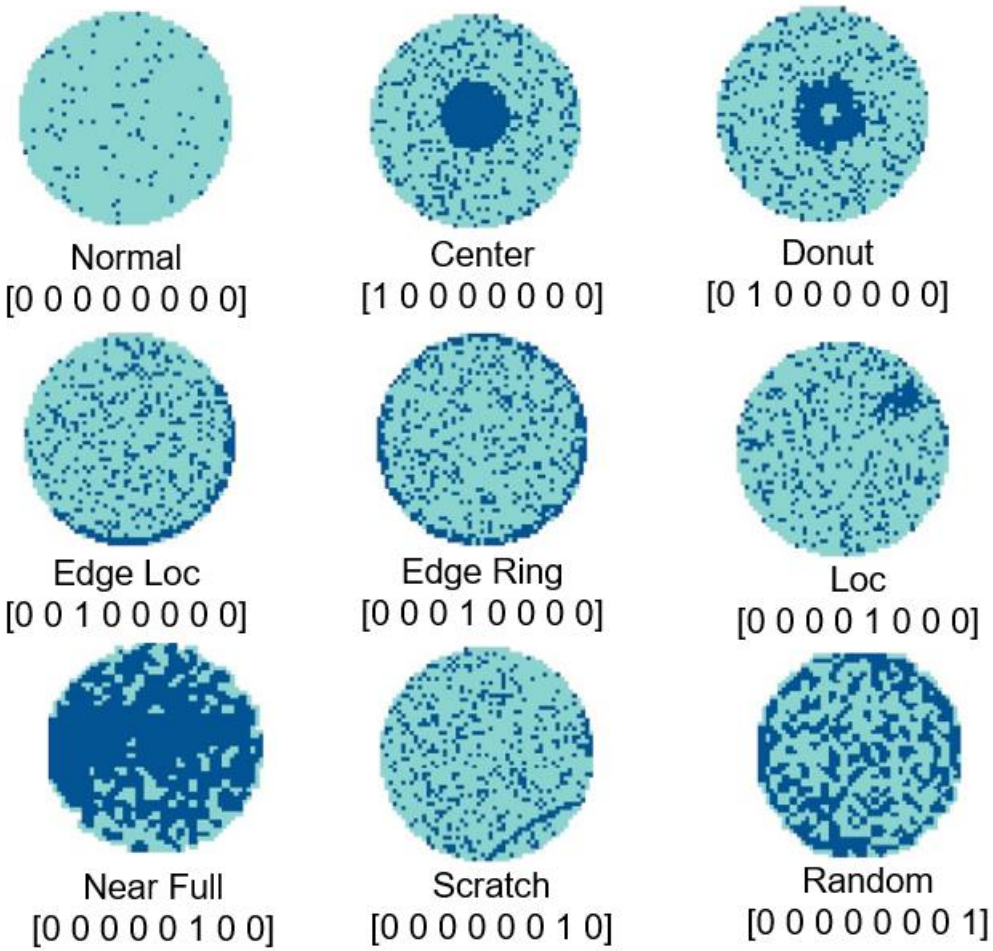
- Obtained through Electrical Tests
- 38000 Images in the dataset
- Training Images - Defect data of mixed type wafer map
  - 0: Blank spot , 1: Electrical test passed, 2: Test fail
  - Data shape 52x52
- Training Labels - Mixed-type wafer map defect label
  - 8 dimensions (corresponding 8 single type defects)

- https://www.kaggle.com/co1d7era/mixedtype-wafer-defect-datasets

Wafer defect predictor using image classification

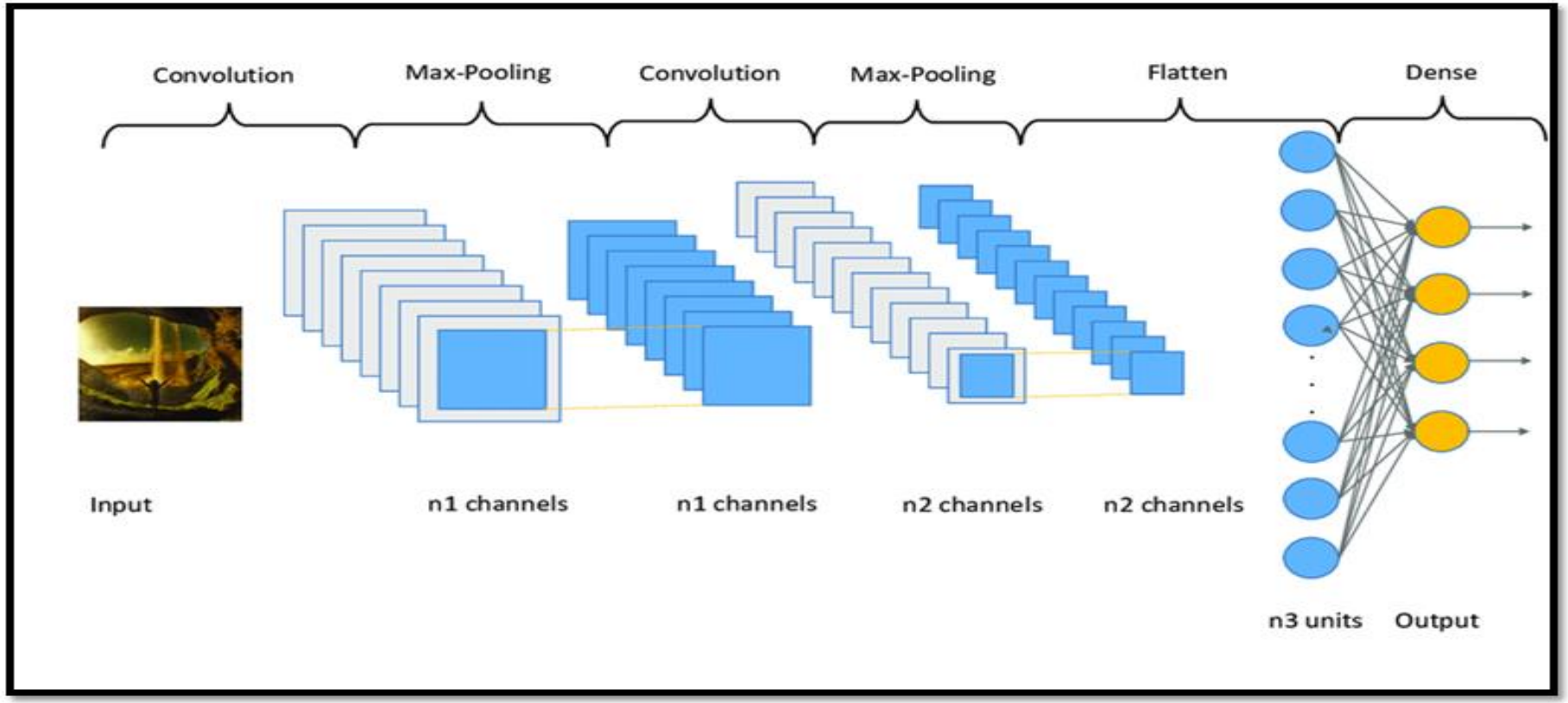
Wafer Map Defects





- https://www.kaggle.com/co1d7era/mixedtype-wafer-defect-datasets

Methodology

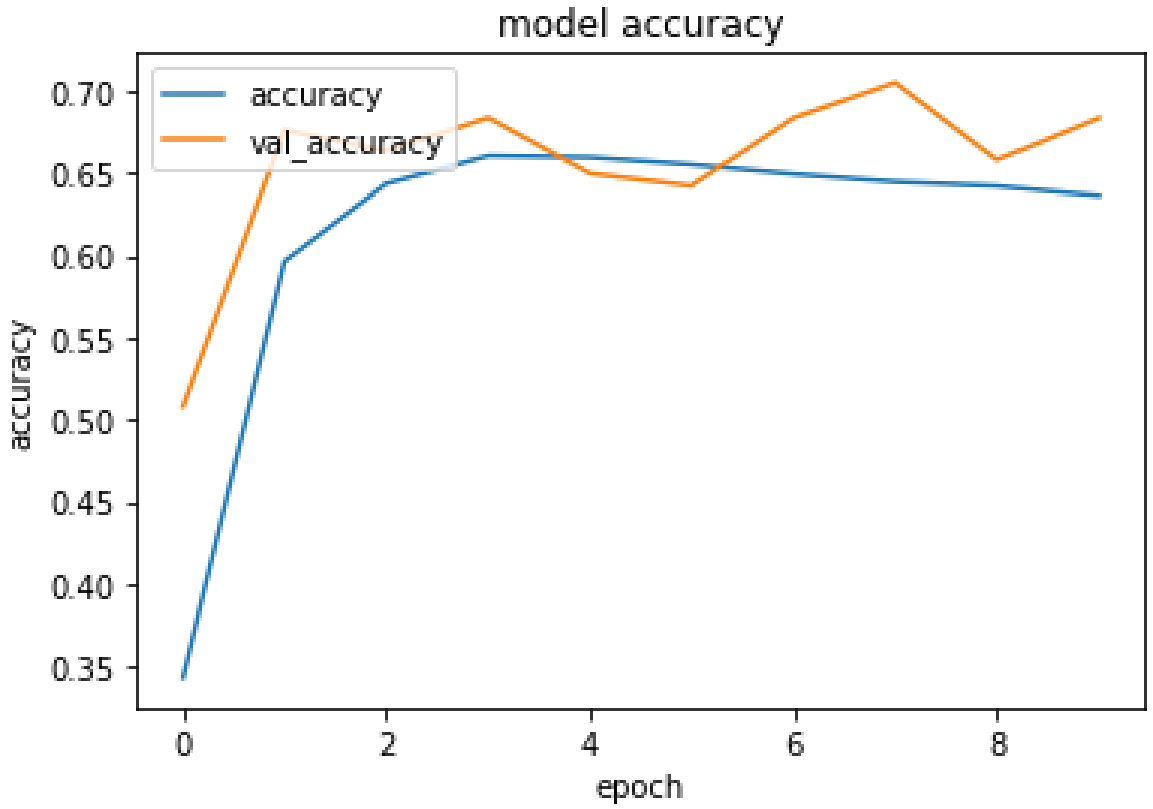


32 Convolution → Max-Pooling → 64 Convolution → Max-Pooling → Flatten → 64 Dense → 8 Dense

Wafer defect predictor using image classification

DEMO

Results

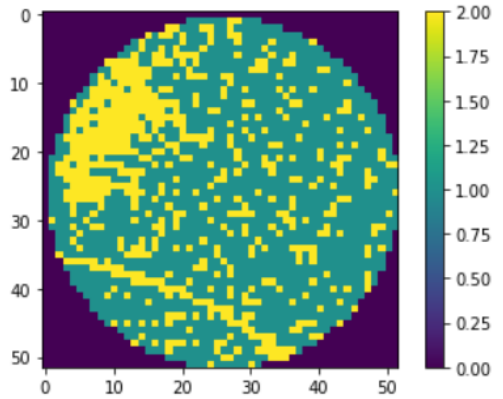


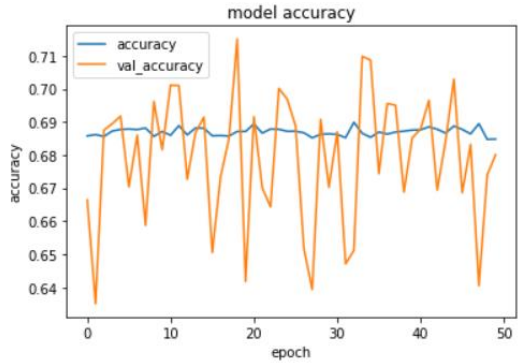
- Training Accuracy – 70%
- Testing Accuracy – 66%

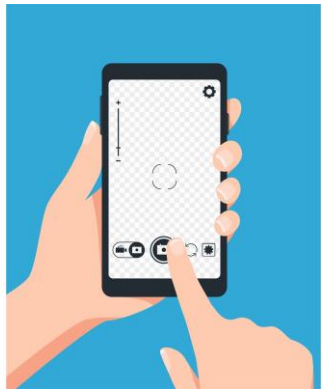
Future Work

- Wafer Defect Detector
  - Increase Accuracy

- Classifiers on Mobile App
  - Model Size v/s Accuracy







TensorFlow Lite

Thank You