



**Oregon State University**  
**Cascades**

Function Requirements Document  
**Semiconductor Wafer Map Unsupervised  
Classification**

Authors: Nathan Sweet, Ashley Doerfler, Tristan Hook

## Overview

---

This project uses a clustering machine learning model to analyze semiconductor wafer results, identifying distinct clusters, patterns, and anomalies. The identified groupings will be delivered to product engineers to allow them to find solutions to creating higher yield wafers.

## Scenarios

---

User 1:

Todd is a project engineer at Qorvo. Todd wants to analyze wafer data to identify clusters of wafers that have similar results to identify what happened to each one in the manufacturing process and which ones are good, and which are bad.

User 2:

Yolanda is a product engineer at Qorvo, She has identified some wafers for a product that are failing tests. Yolanda is going to feed the test data for this product to the most recent model hosted in ML-flow. The model will find common patterns and anomalies from all the wafers that apply to this data, returning to Yolanda a report on the classes including labels for which wafers fall into those classes. Yolanda can then use her knowledge of common causes for these patterns to attempt to modify the production process.

User 3:

Zeke is a computer engineer at Qorvo who is in charge of keeping the models in ML-flow up to date as the production process changes. Zeke has identified a new pattern in the semiconductors that the current model is failing to identify. Zeke will take the test data that this new pattern appeared in and include it in the training set for the model in Databricks. It will be used for training a new model that will likely be able to identify the new pattern. Zeke will then transfer this model to ML-flow for use.

## Functional Specification

## Non-Goals

---

1. Identifying root causes of patterns/anomalies
2. Identifying improvements to process

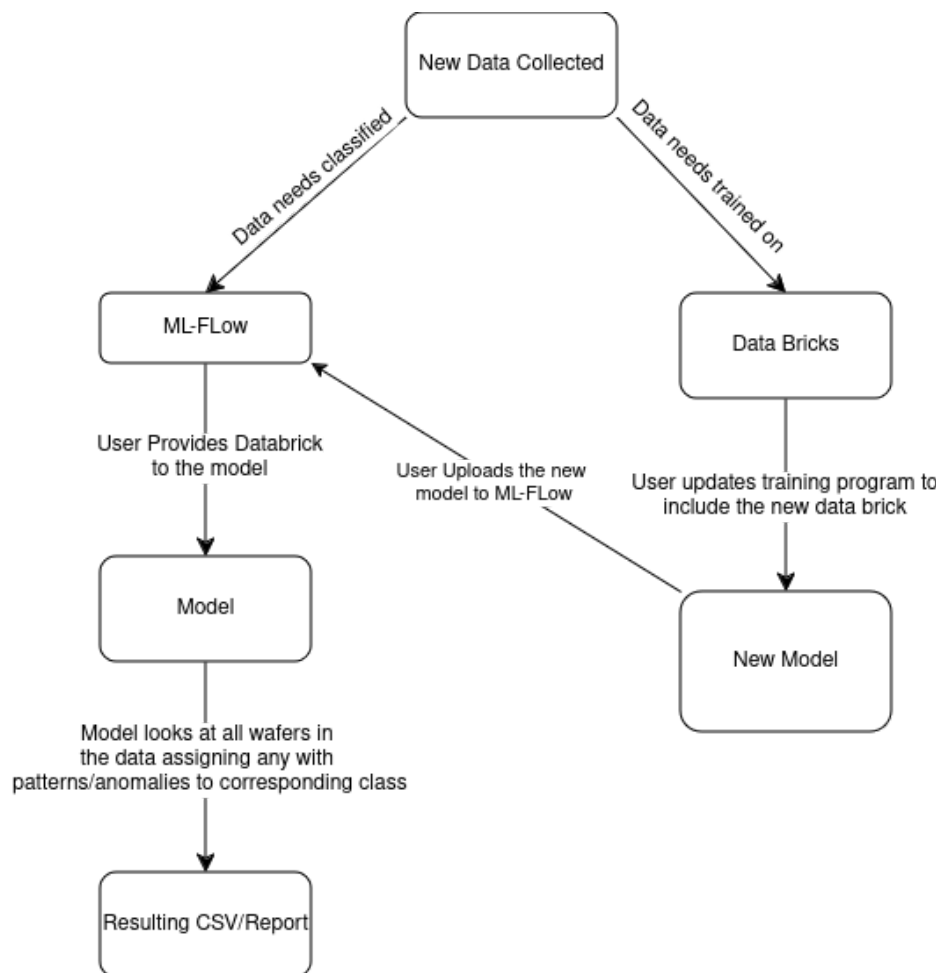
## Stretch Goals

---

1. Continual integration of new data into the model
2. Advanced visualization of wafer patterns
3. Packing the model into a non technical user format

## Staff User Experience

---



## Use Case Diagram

---

