



# LSST Event Broker

---

Team 8

Christopher Wells, Christian Sumano,  
Christian Van Cleef, Clare Volta, Faizon Zaman



# Our Project

---

To build an “Event Broker” for the Large Synoptic Survey Telescope.

This broker should receive and process data on transients from the LSST.

The goal is to classify these transients through a series of binary classifiers.

# Use Cases

---

Help researchers examine transient data from the LSST

We aimed for a high level of abstraction so that researchers could simply “plug in” whichever rules they would like to use to classify transients.

Our framework can be used by anyone interested in learning about astrophysical phenomena

# Domain Research

---

Building an Event Broker required knowledge of how astrophysical events are classified by astronomers.

We were fortunate to have assistance by our domain experts, Professor Kanbur and Professor Ashish Mahabal of Caltech

We learned of the many factors that govern star classification:

- Time series frequency
- Light magnitude
- Periodicity
- Slope
- Color
- ...and more

# Prototype

---

First step was to set up a prototype

Created a working binary classifier

Created our own dummy data to test the output

Ex. returning a single observation data

Classify the data based on if the slope exceeds a particular margin of error

Incredibly accurate in classifying the correct transient

# Framework Design

---

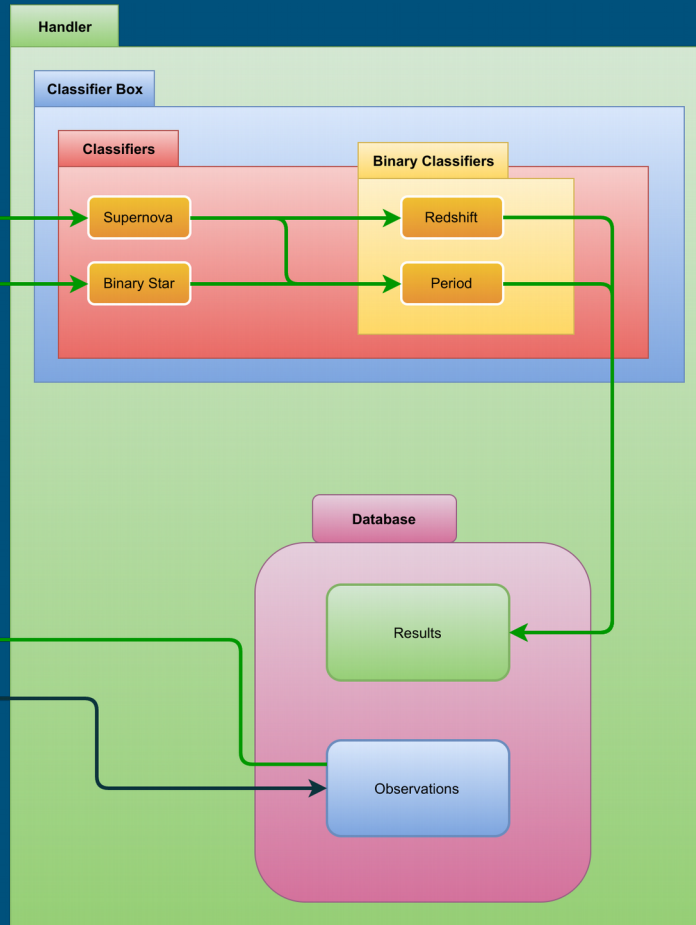
Focuses on allowing the researcher to specify everything

Made up of composable pieces

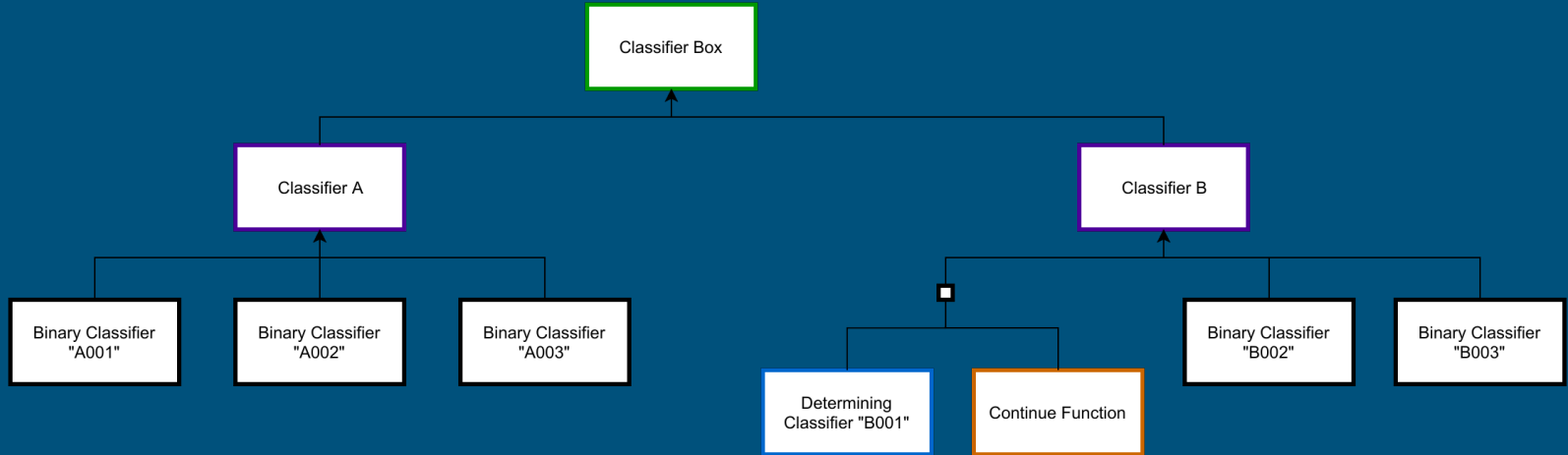
Handles input/output separate from calculations

Allows for parallelism and concurrency

Enables easy testing of the framework



Data Flow



## Classifier Box Construction



# Framework Implementation

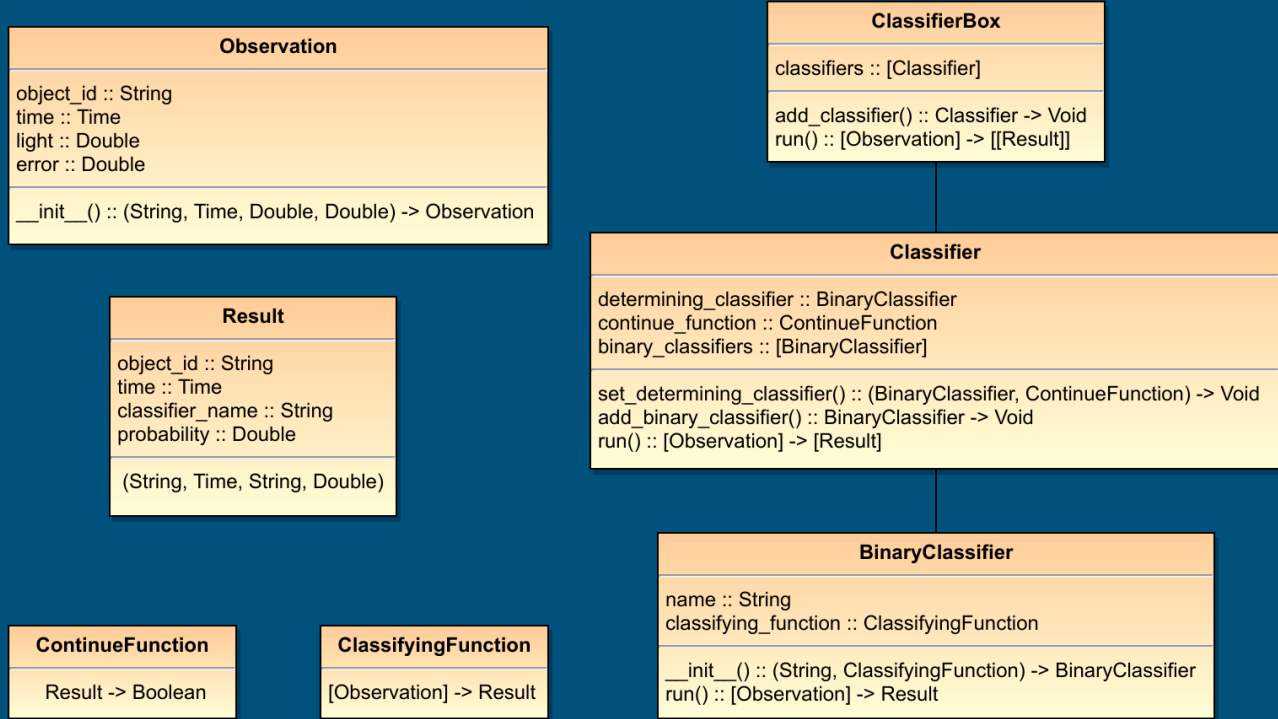
---

Implemented in Python using an OOP approach

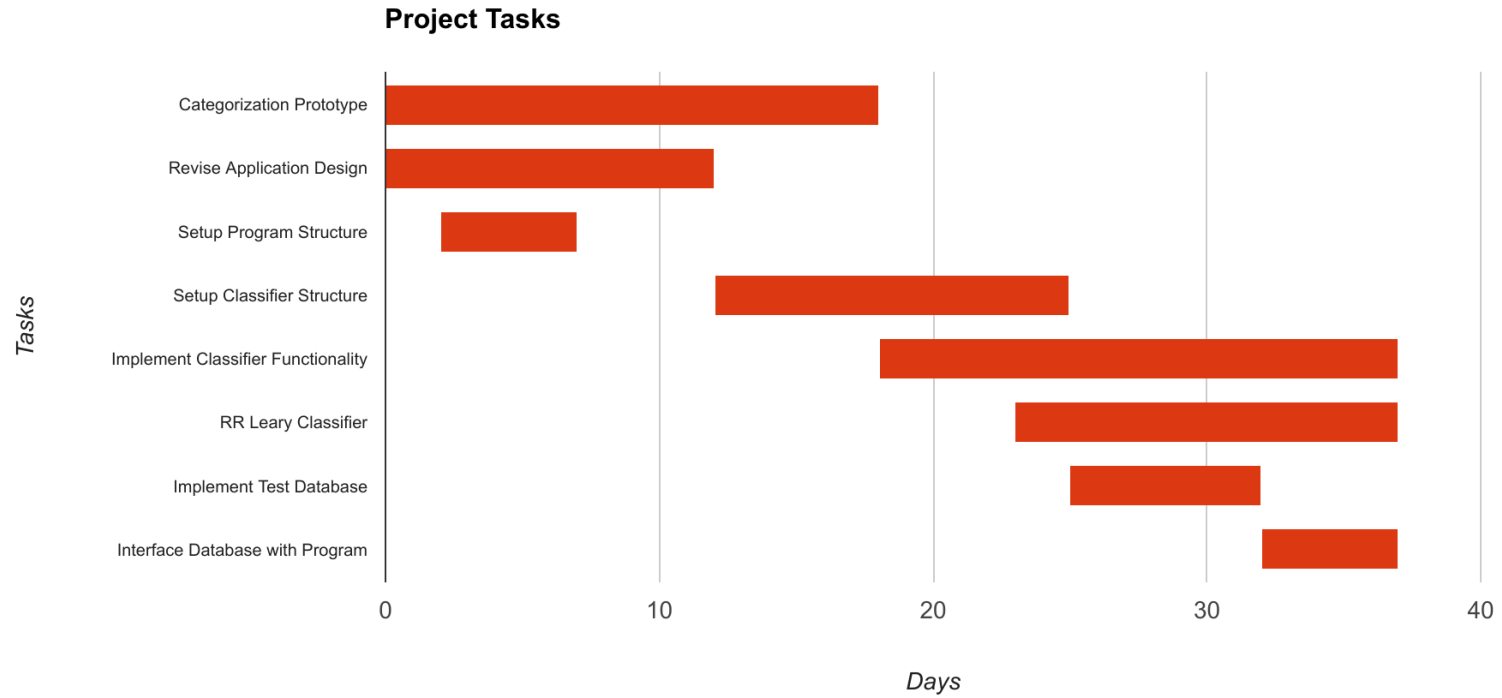
Included a Handler for MySQL

Unit tests for the non-input/output components

Used Conda for library packaging



## UML Diagram



Gantt Chart

# Demo

---