Research Aim: The aim of this research is to determine whether computer vision can be used to process real-time MCAST library surveillance footage and observe students' activities and durations in the library.

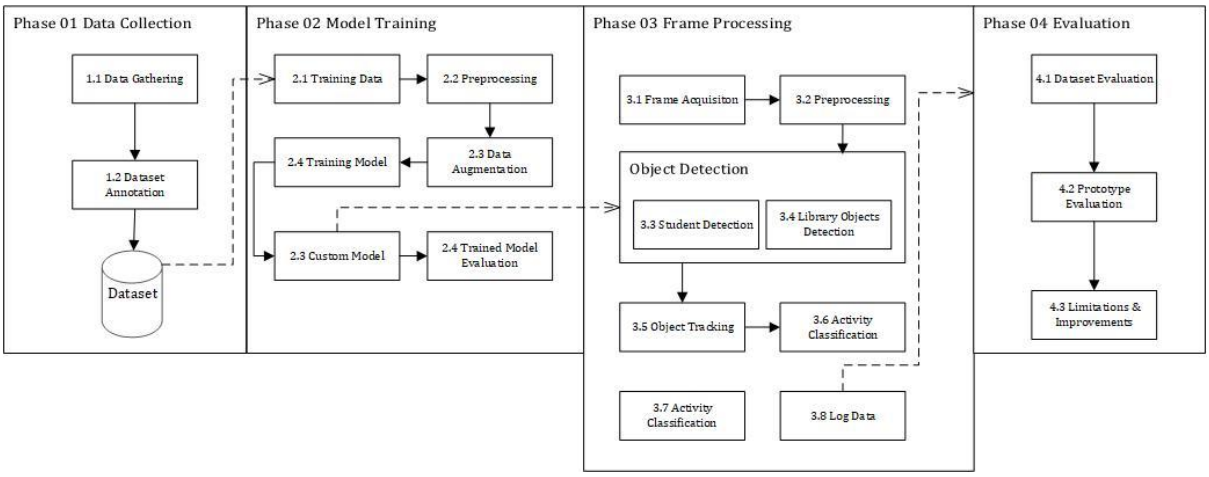
Hypothesis: Real-time computer vision detection and tracking algorithms can accurately detect and monitor individual students and library objects within the MCAST library's surveillance footage. Furthermore, an activity classifier is used to determine the specific activity task of each student and measure the duration period. The collected data will assist the MCAST library staff in making informed decisions that would be of benefit to the library's resources.

Research Questions:

1. Which object detection algorithm can robustly detect users and activity objects from wide perspective angles?
2. Which object tracking algorithm can track users and activity objects accurately?
3. How can student activities be classified?
4. How will the algorithm determine the activity task that the student is doing when the student has different potential activity tasks surrounding him?

Methodology

Pipeline:



Performance Metrics:

- mAP@0.5 will be used to determine if the object detector is accurately detecting objects.
- Confusing Matrix will be used for activity classification and object detection to determine whether the trained object detector model is capable of classifying objects accurately.
- F1 Score will be used for activity classification to determine whether valid activities would be classed.