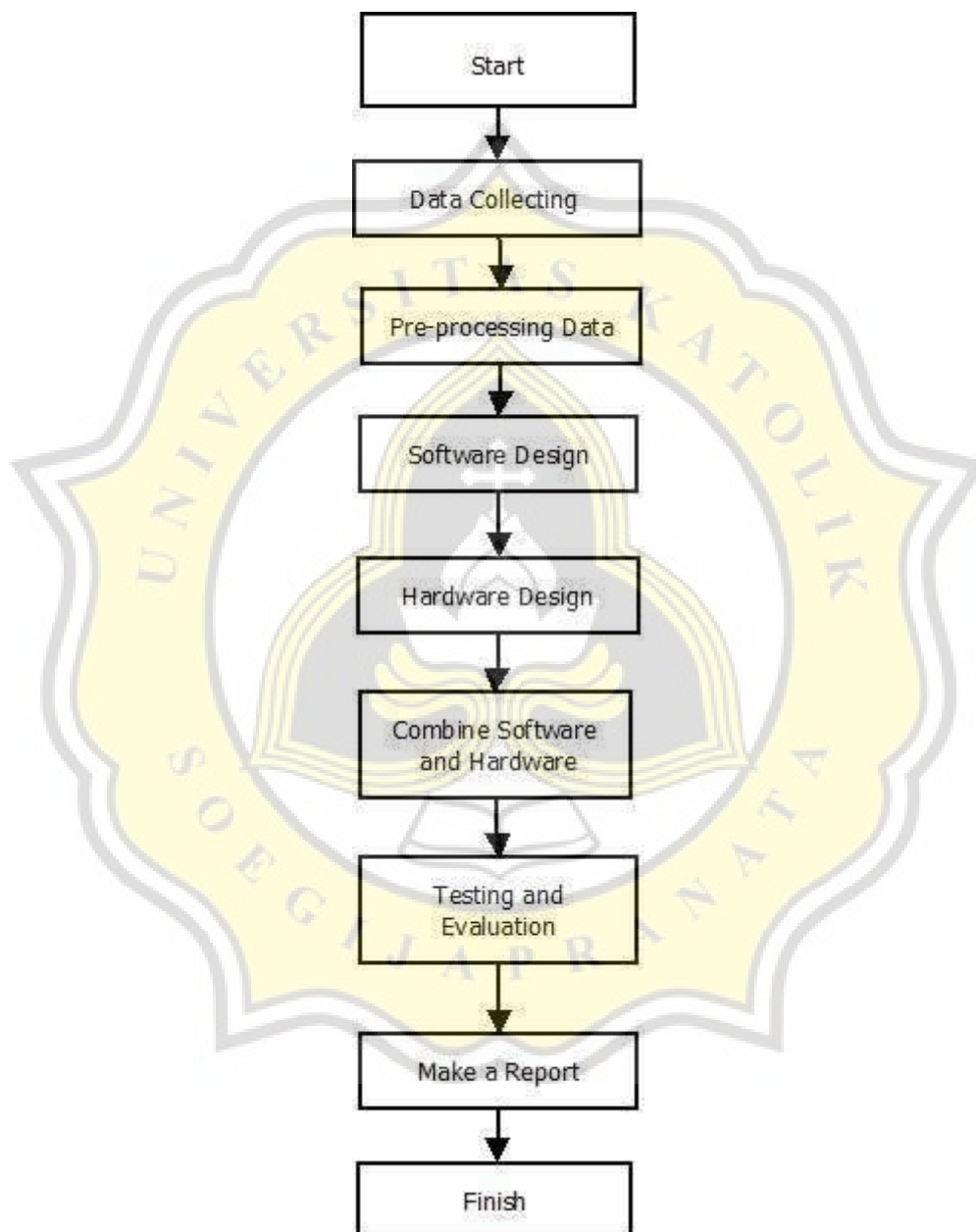


## CHAPTER 3 RESEARCH METHODOLOGY

### 3.1 Research Design

The following shows the research methodology on Figure 3.1:



**Figure 3.1** Shows Research Methodology

### **3.2 Data Collecting**

The Kaggle website (<https://www.kaggle.com/andrewmvd/face-mask-detection>) was employed to retrieve the dataset. There are three classes in the existing dataset that are utilized as training data for the artificial intelligence model: using a mask, not using a mask, and using a mask incorrectly.

### **3.3 Pre-processing Data**

Before the image will be processed, the image will be labeling. The purpose of this step is to classify the image.

### **3.4 Software Design**

The detection system is a program that has been taught to look for mask usage (using masks, not wearing masks & using masks but wrong). To detect the use of masks, this system uses Single Shot MultiBox Detector (SSD) architecture. SSD is an algorithm with a bounding boxes feature. This method has a higher computational and detection speed value than other methods.

### **3.5 Hardware Design**

The hardware consists of Nvidia Jetson Nano, camera, Wifi adapter, and other supporting devices. Nvidia Jetson Nano is an Artificial Intelligence (AI) development kit that can be used to run a variety of modern AI loads with amazing performance. With the Nvidia Jetson Nano, developers can run AI frameworks and models for applications such as image recognition, object detection, segmentation, speech recognition, and more.

### **3.6 Combine Software and Hardware**

After the software system runs as expected, the system code is copied and implemented on the hardware system. At this stage, some code adjustments are needed to match the existing hardware.

### **3.7 Testing and Evaluation**

The system is integrated directly by the team. When all run as expected (can detect the use of masks, detect violations, sound an alarm, and upload violation test data to the hosting), the system is declared passed and ready for further use.

### **3.8 Make a Report**

In writing the report, I first wrote chapters 1-3. After writing chapters 1-3, while waiting for improvement, I worked on chapter 4. After that, I tried the system again with a lot of data which will be discussed in chapter 5. After that, the research results are written in chapter 5. Finally , draw a conclusion in chapter 6

