

## CHAPTER 6

### CONCLUSION

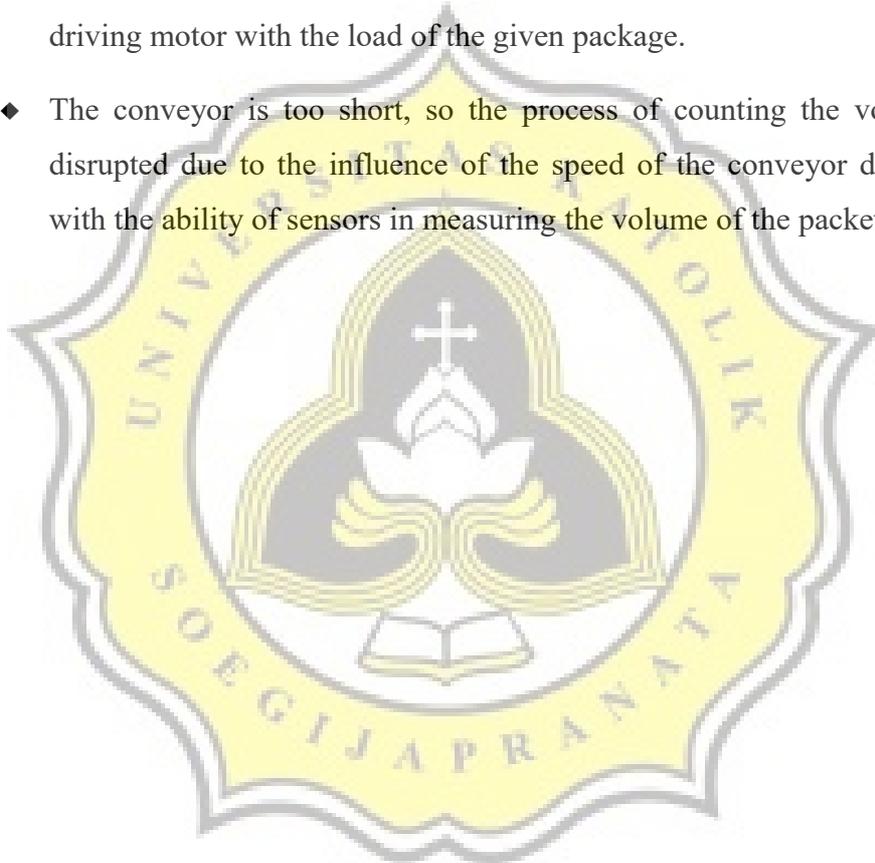
The purpose of this project is to create a prototype that serves to assist human work in the process of sorting the delivery package, so that the sorting process can be done and run automatically, without any human intervention.

- This sorting process, has been integrated with the computer using an Arduino Mega 1280 microcontroller that has been programmed in it.
- Sorting is done by calculating the volumetric weight as well as the actual weight. The results of the volumetric weight and actual weight calculations will be compared to determine the decision to be taken. If the weight is volumetric  $>$  actual weight, then the decision taken is to use volumetric weight values. Vice versa, if the actual volumetric weight  $<$  weight, then the decision taken is to use the actual weight value.
- Packages to be sorted and measured must have dimensions that should not be  $<$  the transmitter and receiver dimensions on ultrasonic sensors. If the packet has dimensions of  $<$  dimension transmitter and receiver, then packet calculation using ultrasonic sensor will have error in counting process. Thus, to make a measurement of a packet, the packet dimension must be at least  $= / >$  the transmitter dimensions and ultrasonic sensor receiver.
- And for package surface problems, ultrasonic sensors can only work optimally if the packet surface to be measured is a flat surface. The surface is not flat or round or curved, will not be able to be measured optimally. Because ultrasonic sensors require a flat surface as an object to reflect sound waves, so that the sound waves delivered can be re-received in the correct position.

- The result of packet volume calculation using Conveyor OFF Delay was much better than using Conveyor ON, No OFF Delay. Because the percentage error value obtained from Conveyor OFF Delay  $<$  Conveyor ON, No OFF Delay. In other words, the packet volume calculation results will be much more accurate because it has a small error value.
- Objects or packets that are too small will tend to produce a large percentage of error value. Either it uses Conveyor OFF Delay, or Conveyor ON, No OFF Delay. However, the percentage of error values obtained from the calculation of the volume of a small enough object, will still be much greater percentage error value when using Conveyor ON, No OFF Delay. Thus, to calculate the volume of an object sufficient or too small, it is not suitable to use Conveyor ON, No OFF Delay.
- Because the conveyor has not been able to run perfectly, then automatically calculating the value of the length using laser sensor and ldr sensor (measuring the value of ms) will also definitely get a bigger error value than the calculation of the value of width and high value by using ultrasonic sensors. However, the percentage of error values for packet length values remaining much greater if the calculations are performed using Conveyor ON, No OFF Delay.

Constraints contained in this project include :

- ◆ Conveyor still can not run perfectly (slowly and steadily) due to the manufacture of conveyor frame, conveyor roller and conveyor base is still simple, less precision and need to adjust the power and speed of the driving motor with the load of the given package.
- ◆ The conveyor is too short, so the process of counting the volume was disrupted due to the influence of the speed of the conveyor drive motor with the ability of sensors in measuring the volume of the packet.



For the development of this project in the future :

- There needs to be improvements, so that the prototype of this sort delivery package system can run well and provide precise or accurate measurement results.
- The manufacture and selection of conveyor frames must be precise and precise. Measure and cut out the skeleton, then assemble it with the right count.
- The choice of conveyor base and conveyor roller also should not be arbitrary.
- Use a motor that has a large torque but can rotate slowly and steadily, so packets that have a light weight or weight can be carried and delivered well and smoothly.
- And for conveyors, long conveyors need to be considered first. Create a conveyor with the correct length and as needed. Do not make too short conveyors, because if the conveyor is too short, it will make the packet volume counting process to be less than optimal and less accurate (the effect of motor drive speed, conveyor distance, and also the capability of each sensor used to measure packet volume ).