

## ABSTRACT

Along with the development of science and technology, the more complicated the science and technology that we must learn. In the study of science in the field of engineering, the learning tools such as simulators or props can help us describe the workings of a real system, such as the realization of the use of image processing as input of system.

The use of image processing can help to improve the quality of the image, eliminating defects, identify objects, and merging with another image. With this development of technology, the system is designed using software from National Instruments LabVIEW. Usage on LabVIEW can help to realize the detection system is more real to see with the virtual laboratory. The existence of the LabVIEW Vision Development Module allows users to develop and implement the processing on the image. Through the Vision Development Module we can acquire the image on a plane then perform object detection to the ball and read the position of the ball in the form of coordinates (x, y).

Before making this ball position detection system, the author designed and build the final project's tools that will be used first. The object being detected in this final project is a white ball that is above the contrast plane. This detection system will focus on system inputs are required, the position of the ball in the form of coordinates. By utilizing image processing and the correct method, the system can be designed for the detection of this final project. Object identification methods are applied in this final project, the method is template matching.

The end result of this system is able to read and determine the position of the ball on the plane using LabVIEW. The coordinate results from the position of the ball that has been read is on the pixel coordinates, the x position at 725,882 and y position at 451,98. The results of these coordinates will be converted to centimeters at 27cm for x and 18cm for y. This result is to simplify the further development of the final project, that is PID control method for controlling the plane.

***Keywords: NI Labview, Vision Development Module, Template Matching.***