# Control of Belts for Classification of Geometric Figures by Artificial Vision

**Authors :** Juan Sebastian Huertas Piedrahita, Jaime Arturo Lopez Duque, Eduardo Luis Perez Londoño, Julián S. Rodríguez

**Abstract :** The process of generating computer vision is called artificial vision. The artificial vision is a branch of artificial intelligence that allows the obtaining, processing, and analysis of any type of information especially the ones obtained through digital images. Actually the artificial vision is used in manufacturing areas for quality control and production, as these processes can be realized through counting algorithms, positioning, and recognition of objects that can be measured by a single camera (or more). On the other hand, the companies use assembly lines formed by conveyor systems with actuators on them for moving pieces from one location to another in their production. These devices must be previously programmed for their good performance and must have a programmed logic routine. Nowadays the production is the main target of every industry, quality, and the fast elaboration of the different stages and processes in the chain of production of any product or service being offered. The principal base of this project is to program a computer that recognizes geometric figures (circle, square, and triangle) through a camera, each one with a different color and link it with a group of conveyor systems to organize the mentioned figures in cubicles, which differ from one another also by having different colors. This project bases on artificial vision, therefore the methodology needed to develop this project must be strict, this one is detailed below: 1. Methodology: 1.1 The software used in this project is QT Creator which is linked with Open CV libraries. Together, these tools perform to realize the respective program to identify colors and forms directly from the camera to the computer. 1.2 Imagery acquisition: To start using the libraries of Open CV is necessary to acquire images, which can be captured by a computer's web camera or a different specialized camera. 1.3 The recognition of RGB colors is realized by code, crossing the matrices of the captured images and comparing pixels, identifying the primary colors which are red, green, and blue. 1.4 To detect forms it is necessary to realize the segmentation of the images, so the first step is converting the image from RGB to grayscale, to work with the dark tones of the image, then the image is binarized which means having the figure of the image in a white tone with a black background. Finally, we find the contours of the figure in the image to detect the quantity of edges to identify which figure it is. 1.5 After the color and figure have been identified, the program links with the conveyor systems, which through the actuators will classify the figures in their respective cubicles. Conclusions: The Open CV library is a useful tool for projects in which an interface between a computer and the environment is required since the camera obtains external characteristics and realizes any process. With the program for this project any type of assembly line can be optimized because images from the environment can be obtained and the process would be more accurate.

**Keywords :** artificial intelligence, artificial vision, binarized, grayscale, images, RGB
**Conference Title :** ICMEAE 2015 : International Conference on Mechatronics, Electronics and Automotive Engineering
**Conference Location :** Prague, Czechia
**Conference Dates :** July 09-10, 2015