



## Cover page

Project title: Cup Filler

Academic Year: 2024-2025

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**Project Type : Hardware**

Supervisor Name: Dr.saed tarapiah

### Format:

- Single space, Times New Roman.
- 12 pt,
- Maximum 1 page.

### Abstract Body:

#### Items must be provided in the Abstract:

- Why do you think this project is important? Please explain the significance of this Project in brief.
- In your point of view what are the important aspects that should be covered in the project?
- Objective(s): In your view, please explain the main objectives of the project.
- Methodology: Give a brief outline of the application development process.
- Had this project been done before? Are there any similar applications available today?
- **Note:** Please deliver this abstract early to ensure that your Project has been approved by the department's projects committee. **Registration will not be done without this approval.**



## Project's Abstract:

As more emphasis is being put to automating the production lines, clients' requirements have led to the development of more intelligent systems. This paper describes a machine that automatically detects the size and color of cups, fills them with the corresponding product such as ketchup and mayonnaise, or orange and strawberry juice. The system integrates sensor and computer vision-based detection systems for the color and height of the cup. Color detection uses a camera system bundled with OpenCV whereas height measurement gyroscopes using ultrasonic sensors determine the size of the cup whether large or small. Depending on the attributes detected the system has dispensing systems such as solenoid valves or some pumps which dispense the appropriate substance in to the cup. On board the system is the microprocessor and microcontroller (Pic, Raspberry Pi or Arduino) that interfaces with the sensors to control them and carry out data analysis and even control output devices (actuators). The project also fields a conveyor belt that is purposed with distributing cups during [among] certain levels of detection and filling. The main purpose of this project is to enhance production output with the poorly done task of filling the recognized cup with some product while reducing the human effort and parameters set for the dispensing system are dispensed automatically.

The development of this automatic filler can be enhanced for a number of operational areas ranging from food preparation to food containers. It also illustrates the usefulness of machine vision together with sensor fusion and an embedded system in a non-stop real world industrial environment.