



Term Paper Proposal

Machine Vision for Child Part Inspection using Composite Features and Random Forest

Group Members: Dan Mathews, Sachin VS

Student IDs: {dan,sachin}.mi20@iitmk.ac.in

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Course Guide: Dr. Sinnu Susan Thomas

Reference Paper: Multi-class Assembly Parts Recognition using Composite Feature and Random Forest for Robot Programming by Demonstration

Reference paper implementation and interconnection with our proposal

The paper that we've referenced makes use of composite features to recognize assembly parts and random forest to classify them for robot programming by demonstration. We intend to follow a similar approach for our problem along with implementing the ideas that we learn during our coursework for Computer Vision.

Introduction and Problem Definition

Inspection for quality control is a vital part in the manufacturing industry. It ensures that the components are of the right fit after their production is done as well as confirms the presence of all modules in the case of an assembled product.

Once a manual task, the process of inspection in modern factories are now being carried by automated systems. Various sensors that detect presence of specific components are used for this procedure. While this appears to be a domain with problems that are solved, on closer inspection, the inefficiencies in using these kind of specialized sensors will be become visible. These sensors are highly specific to the components they work with, have to be replaced with abrasion of the parts and most importantly the cost involved in procuring, maintaining and replacing is pricey.

Hence, it would be meaningful to develop systems that can replace these sensors with utilizing machine intelligence and computer vision.

Aim of our proposal

Our proposal aims to create a machine vision model, that can be deployed on a single board computer with a camera module, for the purpose of child part inspection of assembled systems.

The model which is trained for inspection of a specific system will be able to classify whether a unit that has been assembled contains all the required components by identifying the presence of the child parts that it must contain.