

**Materials List  
for K00259724 FYP**



**TUS**

**Technological University of the Shannon:  
Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:  
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## Materials List

### K00259724 FYP

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## 1.0 INTRODUCTION

For the FYP in industrial automation and robotics engineering, the student will be working on an innovative project that involves creating a custom machine learning algorithm to classify industrial parts. The system integrates various components to efficiently classify these parts into three categories: damaged, undamaged, and unrecognized. The core components of the project include a conveyor belt, servo motor, Siemens S7 1200 PLC, an HMI (Human-Machine Interface), a Raspberry Pi 4, a camera (such as a Cognex camera), encoders, and sensors. Here's a detailed list of the materials needed:

## 2.0 Materials List:

**Conveyor Belt:**

The conveyor belt will transport the industrial parts.

**Servo Motor:**

To control the motion of the conveyor belt, a servo motor is essential.

**Siemens S7 1200 PLC:**

This programmable logic controller will handle the coordination and decision-making aspects of the system.

**Raspberry Pi 4:**

The Raspberry Pi will host the machine learning algorithm.

**Camera:**

Cognex or other compatible models, making sure it's capable of capturing high-quality images and can interface with the Raspberry Pi..

**Sensors:**

Sensors for part collection and release are essential to track when the system has run out of parts or when to release new ones.

**Power Supply:**

Ensuring the necessary power supplies for all components, including the conveyor belt, servo motor, PLC, Raspberry Pi, and other devices.

**Mounting Hardware:**

Depending on design, may need brackets, stands, or other hardware to securely install and assemble the components.

**Wiring and Cables:**

Various cables, such as power cables, data cables, and connectors, are needed to interconnect the components of the system. Cat, generic wiring cables etc.

**Tools:**

Standard tools for assembly, such as screwdrivers, pliers, and wire cutters, will be required.

**Computer and Software:**

A computer with Python, TensorFlow, Keras, and other necessary software for algorithm development and testing.



**Miscellaneous:**

Screws, nuts, bolts, and other miscellaneous items for securing components together.