TU Clausthal
Clausthal University of Technology

3D Printed Conveyor Belt With Motor Control

Type	Research Track, Bachelor Thesis, Master Thesis
Credits	30 CPs
Start date	01.11.2023

Description

Are you interested in learning about 3D printing, mechanical design, and basic electronics? This project offers an exciting opportunity to create a mini conveyor belt using a 3D printer and then program a motor to control its movement. The result will be a functional conveyor belt that you can use to simulate a workplace environment, all while gaining hands-on experience in engineering, design, and programming.

Prerequisites

- Programming Skills: Basic understanding of python programming concepts, including variables, loops,
- conditional statements, and functions. This knowledge will form the foundation for writing code to
- control the motor and conveyor belt.
- Microcontroller Experience: Familiarity with Raspberry Pi will help you how to set up, write, upload
- code and interact with various hardware components.
- Basic Electronics: Students should have a basic understanding of electronic components such as
- motors, motor drivers, sensors, and wiring.

Tasks

1. Research and Planning: Basics of conveyor belt systems, including components like rollers, belts, and motors.
2. Learning the Basics: programming concepts such as variables, loops, conditionals, and functions
3. Design and 3D Modeling: Use 3D modeling software to design the conveyor belt components like, belt surface, rollers, support structures, etc.
4. Convert the 3D models into printable files, ensuring proper dimensions and compatibility with the 3D printer.
5. 3D printing: Print the designed conveyor belt components
6. Mechanical Assembly: Assemble the 3D printed parts, including attaching rollers to frames and mounting the conveyor belt.

7. Motor Integration: Choose a suitable motor and motor driver for the conveyor belt system and also, Wire the motor and motor driver to the micro controller following wiring diagrams and data sheets.
8. Programming: Write code to control the motor's movement, speed, and direction also Implement functions to start, stop, and adjust the conveyor belt's motion.

Resources

1. Yuanyuan Chen (2021). Building your own 3D printer - Link.
2. Ashley Whittaker (2023). How to set up your Raspberry Pi - Link.
3. Kristin Lewotsky (2014). Association for advancing automation- Link.
4. James Whelan, Shawn P. McCarthy, Zachary John Palanchian (2018). Conveyor belt 3D printer MQP- Link.

Contact

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