62607 Applied industrial robotics E21

Group project for three students. Defined on DTU learn.

Goal:

Convert the kuka robot to a PLA 3D printer machine:

1. Make gcode export with 3D printer software (eg Ultimaker Cura). Select a suitable 3d model. Keep it simple.
2. Make a python parser script and parse the gcode(movements) to the RoboDK program.
3. Use RoboDK for full simulation of the robot movement.
4. Make a python export script based on a kuka source and data file.
5. Make a 3D printed mounting tool for PLA hotend extruder.
6. Load the kuka program into the robot controller with a USB-stick.
7. Execute the program and make a 3D print with the robot.

Remark:

- No use of third party libraries for parser and export scripts.
- Comment for each line of code in scripts.

Start date: **11/11-2021 at 13:00**

Project report:

- Deadline: Upload the rapport before to DTU inside: **2/12-2021 at 23:59**
    - Upload place will come later.
    - Upload all materials in one zip-file.
    - Materials:
        - Report (*.pdf)
        - Video (*.*) max 10 Mb or shared on dropbox, onedrive etc.
        - Python code (*.py)
        - KUKA code (the *.src and *.dat files)
        - The Gcode file
- The maximum length of the report is 30 pages, no appendices are needed.
- Document must be formatted as PDF
- There must be code examples of all steps in the report
- Report content requirements
    - Overall project description
    - Short description of each principal components
    - Gcode parser description

- Export kuka python script description
- Describe the relationship between gcode and KRL format with examples
- RoboDK
  - Describe in text, how to simulate it
  - Use screen dumps for documentation.
- Construction of the mounting tool
- Laboratory test with KUKA robot. Describe with text, how you have done it and use pictures for documentation.
  - Calibration of Robot and hotbed
  - Calibration of 3D extruder speed against robot speed
  - Air movement test.
  - 3D printer test
- Make a small video of the final 3D printer demonstration.

I will be present in the Lab room on Thursdays from 13:00 to 17:00. Before if needed.

I can alså be contacted on jenco@dtu.dk “daily basis”.

With problems on the 3D printer hardware contact:

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