The University of Western Australia
School of Engineering
Professor Thomas Bräunl

Robot Manipulators and Automation
AUTO4507

Group Project	Industrial Robot Manipulator	weeks 6-12

GROUPS: Form groups of 4 students

EQUIPMENT: UR5 Robot
TTGO controller
Your developed input device.

Design and build a scaled model of a UR5 robot that will serve as an input device to a real UR5 robot.

- Build the 6-DoF robot model from 3D-printed or laser-cut parts.
  Consider signing up for the Maskers Club and required inductions.
- Each of the 6 axes should be equipped with a sensor (e.g. potentiometer), which is to be fed as an input to a TTGO ESP32 controller (provided).
- Write a program on the TTGO to display the 6 joint angles.
- With the forward-kinematics calculate and display the gripper position in x,y,z for the real UR5.
- Visualize the robot configuration graphically on the TTGO.
- Link your TTGO via WIFI to the UR5's router.
- Use button-1 on the TTGO for establishing and stopping a link to the real UR5.
- Use button-2 on the TTGO close/open the gripper on the real UR5.
- Implement a recording & playback function on the TTGO for a robot movement sequence.

BUDGET

The maximum budget for this project is $20 per group.
If you would like to get your expenses reimbursed, please submit a reimbursement request with invoices via Concur **by the end of week 12** using:

　　　　PG 68 00 10 18　　　BU 00660　　　Mechatronics

DEMONSTRATION

During your lab session in week 12.

VIDEO

Produce a video of about 1 min. length using time-lapse that shows the full construction of your sculpture in automatic mode.

SUBMISSION

Submit one report per team as a softcopy plus hardcopy with official coversheet incl. declarations of all team members:

1. Project design report (*pdf*), which includes:
   - Report on which team member did what
   - CAD design
   - Software design
   - Diagrams, photos, screenshots, plots, etc.
   - Bill of Material with costing (budget)
   - User Manual

   Include page numbers; max 10 pages plus 1 Title page

   Do NOT include:
   - Program code
   - Table of contents, etc.
   - Half-empty pages

2. Source code *(email to project supervisor only, no hardcopy)*, clearly marking any imported code with referencing the source.

MARKING

70%　Functional Performance, Design, Complexity, Innovation
20%　Project Design Report
10%　Video