Homework 4

Introduction to Robotics

Robot – FANUC R-2000iC/165F or UR10e [1]

Modeling assumptions:
Link lengths and joint limits can be assigned to any realistic values:

- Link length errors are assigned to 1-3 mm;
- Angular errors assigned to 1-3 deg;
- Base error are assigned to 0-2 mm shift.

Tasks:

1. Matlab / Python code [2], [3]
2. Develop complete and irreducible geometric model suitable for identification;
3. Generate experimental data for 30 experiments (choose configurations optimally or randomly according to the robot limits);
4. Identify geometric model parameters for experimental data and compare results with the original one;
5. Implement error compensation technique for 3 different trajectories and compare efficiency of calibrated and non-calibrated robots.

Report requirements:

- Irreducible model
- Tables with estimated and real parameters
- Figures with trajectories before and after calibration
- Analysis of obtained results
- Link to the project on https://github.com/

Submit only report to moodle.

[1] Using UR10e model gives 5 addition points for each 2-5 tasks, but homework maximum grade 100.

[2] No allowed to use robotics libraries and toolboxes.

[3] Cheat penalty: 0 for Homework.