MA4825 Robotics: Group Project

Instructions:

1. **Group formation:** Students are to form a group consisting of **5 to 6 members** each. Each group is to elect a representative group leader. Group leaders are to send the complete list of group members to Dr. Ahmad (ahmadk@ntu.edu.sg) by **4th September 2023** with cc. to all team members.
2. **Collection of robotics set:** Each group is to collect a robotics set from Ms. Lee in the mechatronics lab on the **30th August 2023 between 2 pm to 4 pm**. Only the designated group leader and a second are required to collect the set. The set can be kept by group till end of project.
3. **Project Objective:** Design a task-oriented robotics project. The group is to fully utilize the provided robotics set but may supplement with additional designed/constructed components sourced independently [Limited extra components/units or 3D printing services may be provided at the mechatronics laboratory. Some minor machining can be performed in the workshop if required/available. You are to observe all safety rules of the workshop/laboratory].
4. **Basic requirements (must be fulfilled):**
    a. The end-effector/gripper of the designed robot is expected to move within a 3-dimensional spatial coordinate to effect a task-specified application with at least 4 of the 6 motors provided utilized.
    b. The designed robot is expected to perform trajectory planning with kinematics analysis (e.g. forward/inverse kinematics) of the robotics task required
5. **Advance requirements** (extra credit):
    a. Inclusion of motion control implementation.
    b. Navigation & visual components, control interface & other software tools to enhance the overall quality of the project.
6. **Assessment:**
    a. Model demonstration to be held on the **morning/afternoon in Week 11/12 (1st/8th November 2023)** at the **Mechatronics and Control Lab** (date and venue to be confirmed).
    b. Written report (main contents of 8 to 10 pages, excluding appendix). The soft copy of the report to be submitted together with presentation slides, program coding and results of the project if available. Submission date: **a week after the day of Model Demonstration**.

An online briefing will be held in Week 4 once the groups have been finalized. The briefing will go through the instructions above as well as the following:

- Presentation on the Dynamixel motors.
- Provide examples of projects submitted by past year students.
- General questions and answers.

I will announce the date and time on ntulearn.