National Yang Ming Chiao Tung University
Department of Electrical Engineering

Robotics: Homework 5

Due 12/15/22 Fall 2022

1. Derive the dynamic equations to compute the torque at each joint utilizing the Newton-Euler formulation for the two-link robot manipulator example in the class with the center of the mass moved to the middle in each link and with a load m held at the tip of the second link. Can the effect of the load m to the manipulator be replaced by an external force mg with the gravity g in the y direction ? Please discuss it.

2. Provide a stable tracking control law for a multi-DOF robot manipulator and prove its stability. (Hint: Include feedforward terms in the control law.)