

# ECE 417 --- ROBOTICS

## Lab 3, Spring 2021

For this lab you will program the forward kinematics for the Lab-Volt robot. In addition to the routines developed in Lab 2, you are required to write a new routine which will accept the joint parameters  $\mathbf{d}$ ,  $\theta$ ,  $\mathbf{a}$ , and  $\alpha$  as input and will produce the corresponding 4x4 homogeneous matrix as output.

Your main program should accept the five joint angles as input, and then for each link it should call your new routine using stored values of  $\mathbf{d}_i$ ,  $\mathbf{a}_i$ , and  $\alpha_i$  along with the input joint angle  $\theta_i$ . The five 4x4 homogeneous matrices produced should then be multiplied together and the result,  ${}^0\mathbf{T}_5$ , should be printed on the screen.

The joint parameters and definitions of joint angles should be the same as those given in the solution to the homework.