ME567 / EECS 567 / ROB 510 Midterm Exam Winter 2024 (Prof. Bruder)

Time, Place, and Rules

- You will have a 24 hr period to complete and turn in the take-home exam. It will be released at 10am on Wednesday, March 20 and is due at 10am on Thursday, March 21. *This is a STRICT deadline–late submission will not be allowed (automatic ZERO), so don't risk it.*
- Please submit QUALITY photos/scans to Gradescope.
- NO COLLABORATION OF ANY KIND
- Open textbook, class notes, homework
- Calculator/MATLAB/Mathematica allowed (unless stated otherwise) but must show calculation steps for full credit
- It is unethical to enter a question directly into a search engine, hoping to find the answer. Usually this won't help you anyways. You may search definitions/topics but not verbatim questions. NO CHATGPT or the like!
- Piazza will only allow private questions to the instructional team during exam hours. We will make appropriate questions/answers public, so please check to see if your question has already been asked/answered before posting it.
- **Review:** We are available for Q&A and practice exam review during regular office hours. Please come prepared with questions and we will do our very best to answer them.

Material Covered

- Up to (including) lecture on March 11
- HW1 through HW3
- Non-exhaustive list of topics: Rigid body transformations, local and global representations of SO(3), homogeneous transformations, twists, screws, exponential maps, adjoint transformation, forward kinematics, inverse kinematics, rigid body velocities, wrenches, manipulator Jacobian, singularities, manipulability

The exam will **not** cover:

- Quaternions
- Dynamics

Exam Format

- Your exam format will look similar to the practice midterm on Canvas.
- Roughly half the exam will be True/False questions that test concepts. The other half will involve problem solving, i.e., written answers showing work.
- If you give more than one solution to a problem, you must tell me which one to grade. If you do not tell me which one to grade, I will grade the first one, even if it is wrong and something later is correct. What else can I do? The only reason I mention this is because it has come up in the past.
- Students sometimes ask whether they have shown enough on the workout problems. **I cannot answer that question.** My best advice is to show your work clearly. Show the steps you are following. You do NOT need to re-derive something we have established in class or HW. You can just state it as a fact and then use it.