CSCE 452/752 Robotics and Spatial Intelligence, Spring 2026

Homework 2

For this assignment, you'll use the last two digits of your Texas A&M UIN to select a task and environment for a hypothetical robot to complete.

8th digit of UIN	Task
0	assembling IKEA furniture
1	performing surgery
2	rescuing survivors
3	sorting fruit by size and color
4	changing a diaper
5	delivering a package
6	playing chess
7	inspecting the inside of a long pipe
8	photographing a wedding
9	cleaning up small debris

9th digit of UIN	Environment
0	an active volcano
1	deep within the Atlantic ocean
2	Memorial Student Center, College Station, Texas
3	a ski slope
4	The Brazos River
5	The Lone Star Hiking Trail
6	an ice rink
7	Great Sand Dunes National Park, Colorado
8	Victoria Crater, Mars
9	your home

You are a roboticist that wants to design a robot that can complete the task of autonomously _____ in the environment _____ . Consider the basic hardware design of your robot and answer the questions below. (Note that some combinations of task and environment may seem to be somewhat whimsical or impractical. In those cases, you should use a judicious

combination of imagination and reasonable assumptions to complete the assignment.)

1. Choose a mode of locomotion for your robot. Explain, in one English sentence, why this mode of locomotion is a good choice for this problem.
2. Identify what type of actuators your robot will use to achieve this mode of locomotion.
3. Use your favorite search engine to locate actuators of this type manufactured by at least two different companies. Provide links to the product listings.
4. Compare and contrast the specifications for those actuators, as listed in the product descriptions or data sheets.
5. Choose at least two types of sensors for your robot. Explain how the information from these sensors can help the robot complete its task.
6. For one of those two sensors, your favorite search engine to locate sensors of this type manufactured by at least two different companies. Provide links to the product listings.
7. Compare and contrast the specifications for those sensors, as listed in the product descriptions or data sheets.