

# DESIGN IMPLEMENTATION, AND ANALYSIS OF ROTATABLE AND CONTINUOUS MOVING WALL CLIMBING ROBOT

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## ABSTRACT

This thesis describes the design and implementation of a wall-climbing robot using suction cups to carry the robot on a vertical wall or ceiling. Two chains with attachment extension were used as tracks and to attach limit switches into, and each limit switch is attached to a suction cup to activate or deactivate the suction accordingly. Two torque motors that are responsible for movement and rotation with a locking system are used to power the robot.

The thesis describes the original design idea and the factors that are considered for the design, and then it shows the implementation of that design and how it is manufactured. After that, analysis of the robot is conducted focusing mainly on safety, vibration and stress analysis of the overall robot body and some critical parts of the robot.

The thesis then shows the control methods that are considered to control the robot, as well as focusing on two controlling options that we used, and what the advantages and disadvantages of each option are.

It was concluded that the wall-climbing robot designed in this thesis was successful considering the cost optimization of it. Using the proper materials needed, and optimizing the robot for its performance rather than its cost makes it more practical and reliable for frequent use and to serve its purpose.