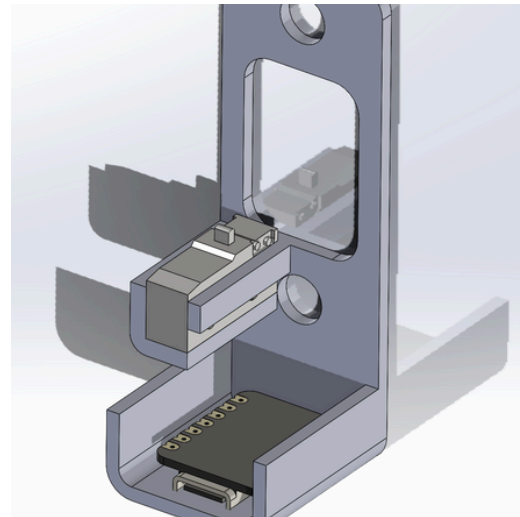


INVASIVE SMART DOOR LOCK KIT - SARATECH

SARATECH

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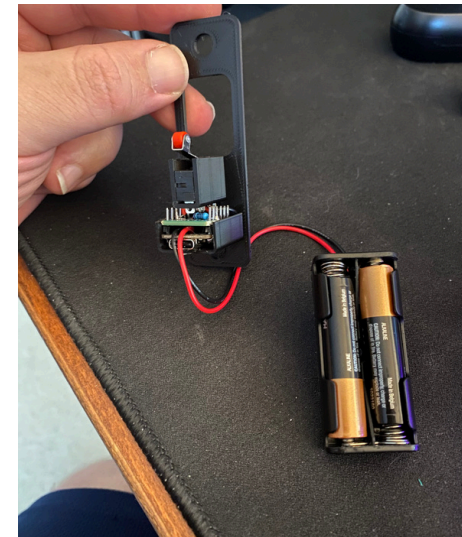
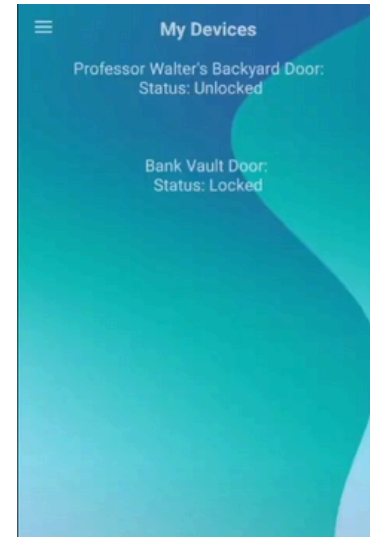


What?

- Design an invasive smart lock kit that fits 80% of deadbolt locks.
- The invasive lock must notify the user whether their door is locked or unlocked
- The Invasive Smart Door Lock Kit must be encrypted

How?

- Used **SolidWorks** to design this Smart Door Lock Kit
- Worked with a team of four to program the smart lock using **Flutter** for the android and apple app and AWS Studio for the MQTT Server



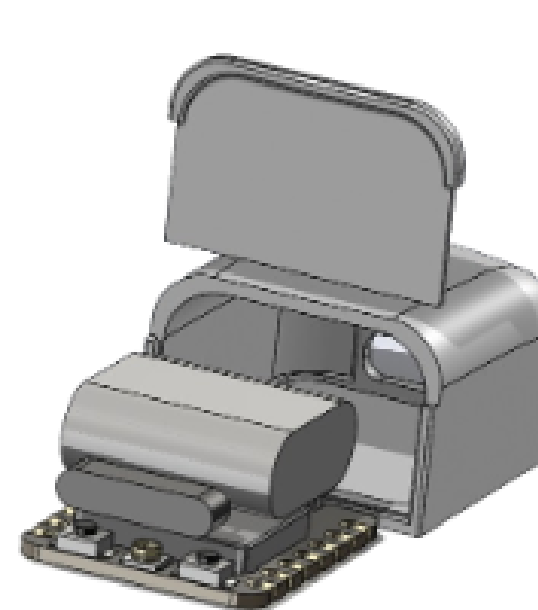
Results

- The design and app fulfilled its purpose with it being sold to manufacturers for \$25 compared to the average \$50 smart lock.
- The smart lock kit is compatible with 90% of deadbolt locks.
- The invasive Smart Door Lock Kit is encrypted with an SQL Database

NON-INVASIVE SMART DOOR LOCK KIT - SARATECH

SARATECH

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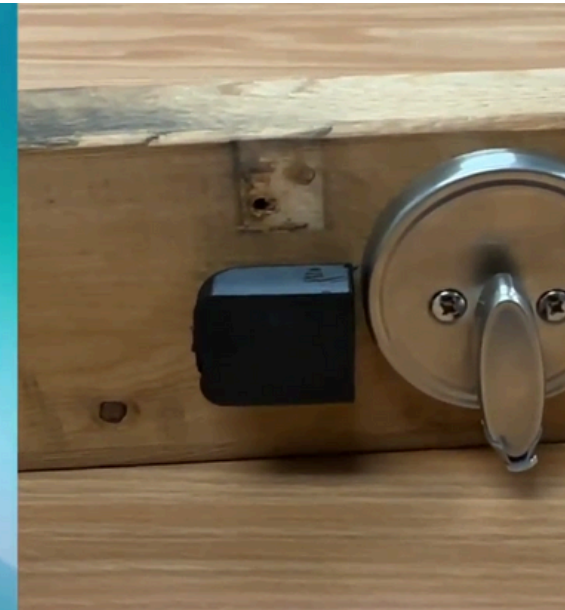
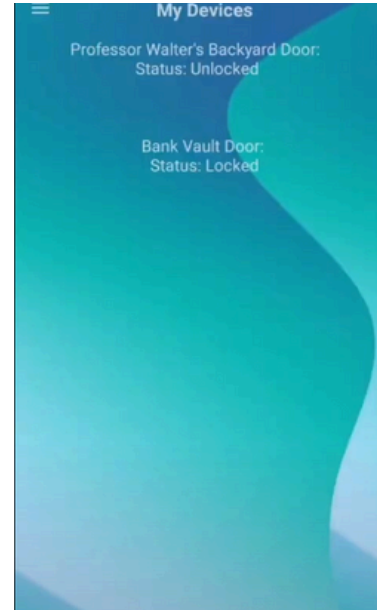


What?

- Design a non-invasive smart lock kit that fits 80% of deadbolt locks.
- The invasive lock must notify the user whether their door is locked or unlocked

How?

- Designed on **SolidWorks** a **non-invasive smart door lock kit that mounts next to a deadbolt lock**
- Programmed using **Android Studio** with languages such as XML as the Frontend and Java as the Backend to connect to the MQTT Server



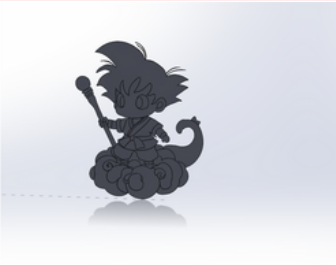
Results

- The cost to manufacture was \$2.50 compared to a twenty-dollar cost, and it is primarily used for apartment owners who can't alter their doors to check their lock status.

MECHANICAL WALKER - MAE 183

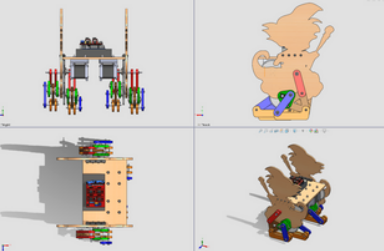


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What?

- Design a Mechanical Walker Robot that can navigate through obstacles and can last for more than one hour without recharging.
- The Walker must use for legs for steering.



How?

- Used **SolidWorks** to design fixture
- Used **Arduino** for electrical structure
- Implemented **DFA** principles to reduce product assembly cost



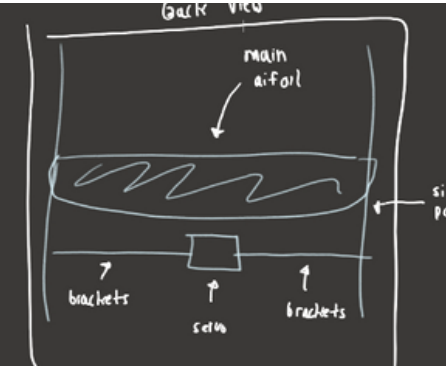
Results

- Was able to complete the course within one minute
- Took first place in overall course-wide robot competition against 25 teams

ANTEATER FORMULA RACING ACTUATING SPOILER

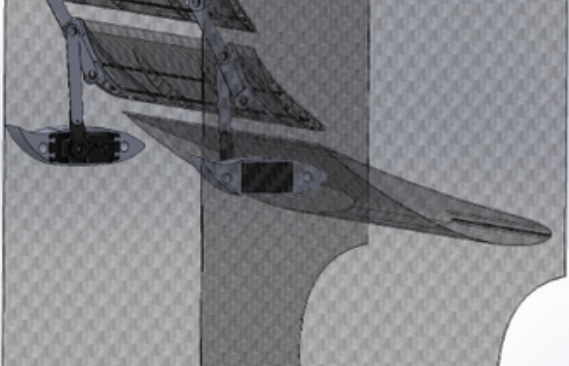


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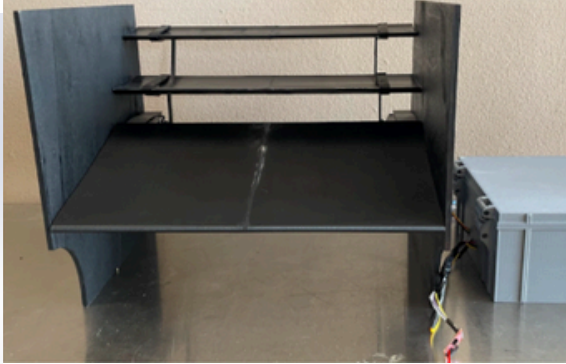
What?

- Design an actuated spoiler that adjusts to the optimal angle of attack for maximum lift and drag.
- Ensure the actuated spoiler system responds dynamically to varying speeds and aerodynamic conditions for optimal performance.



How?

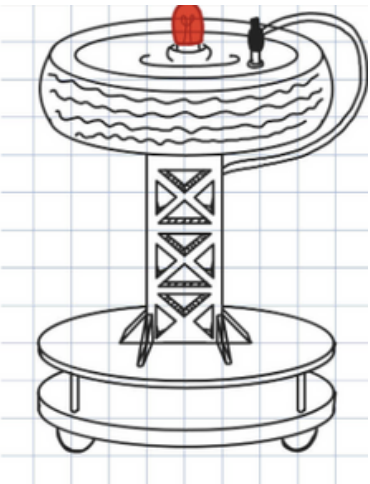
- Used **SolidWorks** to the linkage system for the actuated spoiler
- Use an air pressure sensor to determine the proper angle of attack to maximize lift and drag coefficients



Results

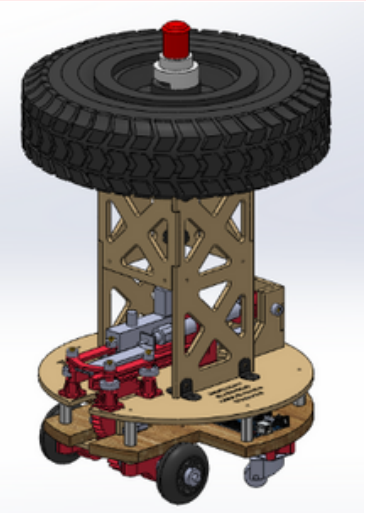
- Reduced servo response time by 10%, ensuring quicker adjustments to aerodynamic conditions.
- Enhanced lift and drag by 15% using air pressure sensor adjustments from the wind tunnel at UCI.

AUTONOMOUS PISTON PROJECT



What?

- Design an autonomously actuated robot that can navigate an obstacle course using a specified direction for 25 yards
- Use a servo for steering, and a single pneumatic cylinder for propulsion.
- Tire must be 16 inches above the ground at all times.
- The maximum diameter must be 12 inches in diameter and must withstand collisions from other robots.



How?

- Designed on Solidworks and implemented one way bearing.
- Used Arduino and several sensors for electrical infrastructure
- Worked with a team of 4 to laser cut, structure, wire circuit and code magnetometer/servo using Arduino
- Using ANSYS, I analyzed the stress and strain on the robot's chassis to enhance the parts, ensuring they do not damage the robot.



Results

- Took first place in overall course-wide robot competition against 38 teams
- Robot successfully stayed within course and withstood collisions from other robots by lowering the center of gravity.
- Found suitable spring constant and piston fire interval in order to maximize speed and power conservation