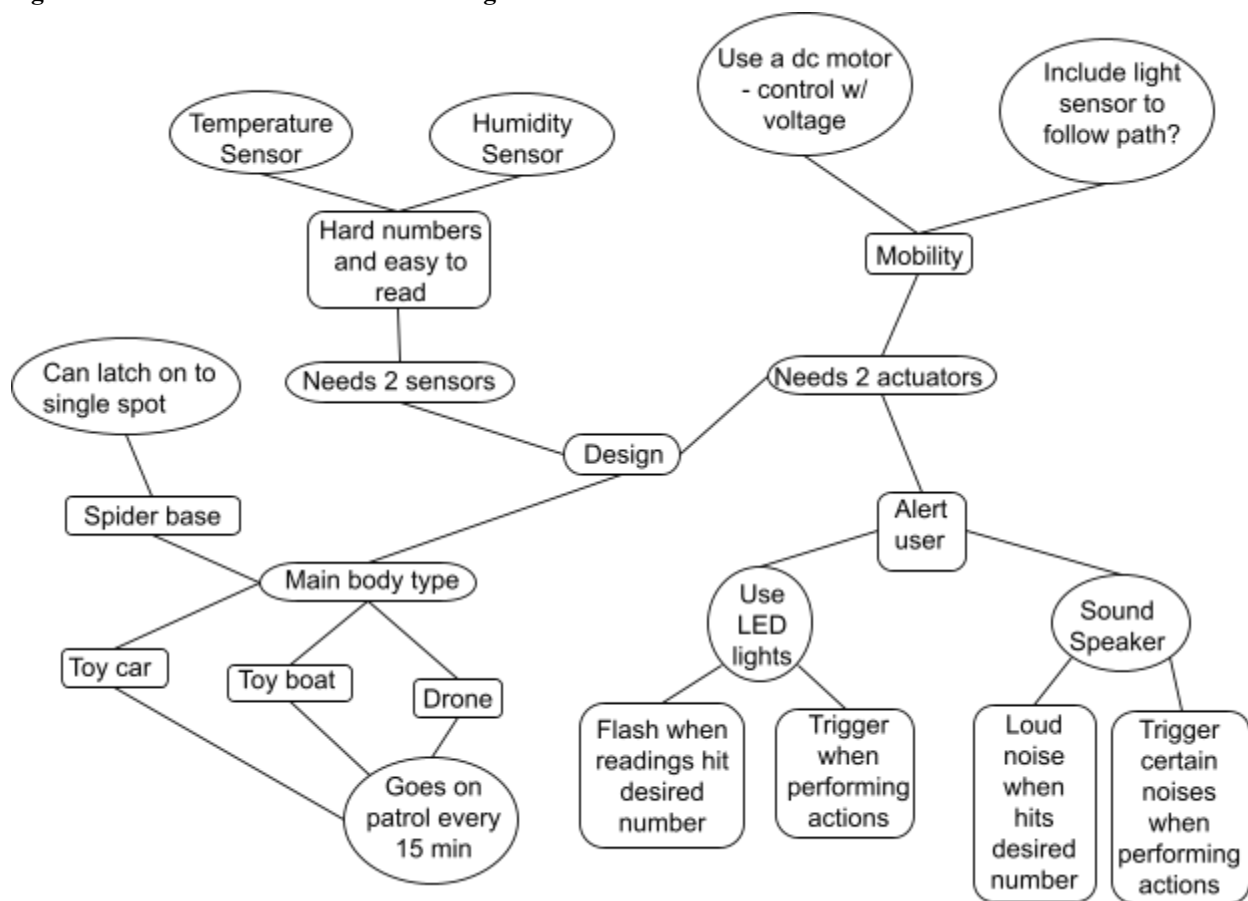


Ideation Process

Brainstorming

The team met in person to brainstorm what the product would look like and what things it would include. We started by looking at the available sensors that we were allowed to use and we settled on two that we wanted to use. From there we moved onto what we wanted to use for the base. After we came up with the different bases, it became clear that every design would include at least one motor. From there we discussed the various ways that we could implement a non-linear actuator to alert the user and what it would be alerting for. Some of this last part of the process was spent looking at various prices and requirements for the second actuator.

Figure 1. Text version of the brainstorming session.*



*Not a complete version of all of the ideas generated; most of it was summarized to fit into the text drawing.

Categorization & Ranking

After generating all of the ideas and the reasonings for various qualifications, the team continued to rank the ideas and aspects of the design. Anything that ranked lower than a three wasn't included as we were only going to develop 3 versions of our design.

Main Body

For the main body, the spider base design was too complex for the parameters and timeline of this project and would require more time than is realistic to be put into designing the base. So that design was rejected by the team. For all chosen options the design would require a patrol function and a programmed path.

1. Toy boat base
2. Toy car base
3. Drone base

Sensors

Going into the brainstorming process, the team already decided that the two sensors that we wanted to work with were the temperature sensor and the humidity sensor. When other sensors were offered as options, the team generally refused to implement them over the two chosen sensors.

Actuators

For the requirements, one actuator could be linear, but it needed to be connected to a complex motor driver IC. Since we wanted to utilize movement in our design the only actuator that fulfilled both desires was a motor (either brushed or a stepper).

1. DC motor (brushed)

For the other actuator, the team responded more to an audible sensor than a visual one.

2. Speaker
3. LED strip

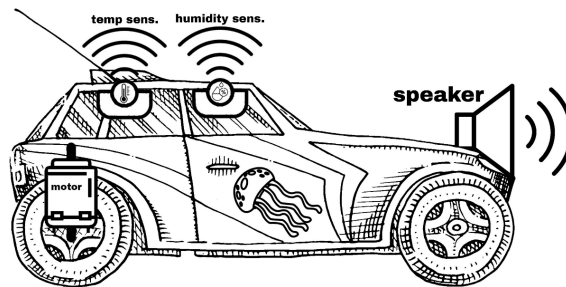
Not Used Ideas

1. Spider base
2. LED strip

Concept Sketches

Design 1

JELLYFISH SKETCH CONCEPT 1 RC CAR



Description

The RC car is a small to medium-sized device about one to three feet long depending on the job or home site conditions. It will be connected to the home or job site WiFi and patrol around a designated area every fifteen minutes and upload all gathered data online easily available on your phone. The car can measure temperature and humidity through the onboard sensors. It can also alert any nearby people of dangerous weather conditions or problems that the car might face on its path with the speaker.

Features

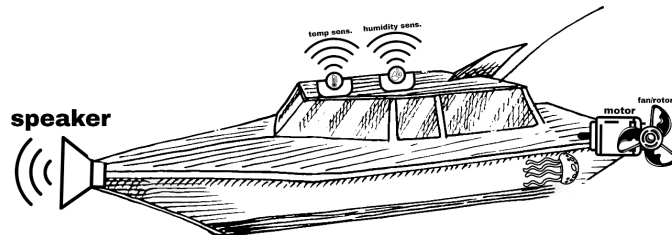
1. A motor that allows the RC car to travel and gather weather data across a long distance on land.
2. A temperature sensor that lets it measure how hot or cold it is.
3. Humidity sensor that lets it measure how much humidity is in the air.
4. A speaker that allows the car to alert people of important weather information.

User Needs & Requirements

1. **The device will contain at least 2 separate serial sensors that measure a specified aspect of the environment:** The RC car will have access to both a temperature sensor and a humidity sensor to gather this weather data.
2. **The system shall broadcast the environmental data to the internet over WiFi using the MQTT protocol:** The RC Car will have onboard WiFi to upload its weather data through.
3. **The device should be able to reposition itself for the optimization of data collection:** Our RC car motors allow it to go anywhere along a predetermined path on land.
4. **The device will contain at least one serial actuator and one motor or linear actuator with bidirectional control ability:** Our RC car uses a motor and a speaker for our actuators.

Design 2

JELLYFISH SKETCH CONCEPT 2 RC BOAT



Description

The RC Boat is larger sized, built to take on close-to-shore ocean and lake measurements. The boat will have a designated path that it will follow along GPS coordinates and will come back to a “home base” to upload all its weather data gathered through WiFi so the operator can see the data easily. The boat can measure temperature and humidity through the onboard sensors. It can also alert nearby swimmers or other boats nearby to avoid colliding with things along its path.

Features

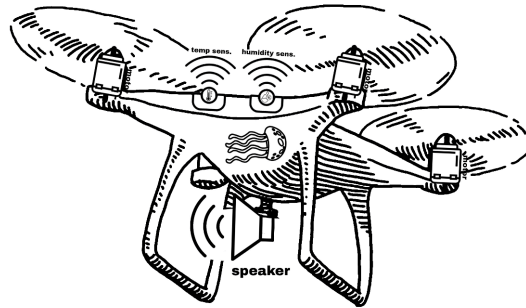
1. A motor that allows the RC boat to travel and gather weather data across a long distance on the water.
2. A temperature sensor that lets it measure how hot or cold it is.
3. Humidity sensor that lets it measure how much humidity is in the air.
4. A speaker that allows the car to alert people of important weather information.

User Needs & Requirements

1. **The device will contain at least 2 separate serial sensors that measure a specified aspect of the environment:** The RC boat will have access to both a temperature sensor and a humidity sensor to gather this weather data.
2. **The system shall broadcast the environmental data to the internet over WiFi using the MQTT protocol:** The RC boat will have onboard WiFi to upload its weather data through.
3. **The device should be able to reposition itself for the optimization of data collection:** Our Boat motors allow it to go anywhere along a predetermined path in the water.
4. **The device will stay within the target budget of \$240:** With the use of only one motor for the boat this is where we can keep costs down.
5. **The device will contain at least one serial actuator and one motor or linear actuator with bidirectional control ability:** Our RC boat uses a motor and a speaker for our actuators.

Design 3

JELLYFISH SKETCH CONCEPT 3 RC DRONE



Description

The RC Drone is average-sized built to be flown anywhere within a wi-fi-controlled area. The drone will have a path determined by the user to go around a collect at various points. The drone will have the ability to gather weather data through the humidity and temperature sensors from any height. It also has access to a speaker that can help people find the drone if it is lost along its route.

Features

1. Four motors allow the RC drone to travel and gather weather data anywhere in the sky.
2. A temperature sensor that lets it measure how hot or cold it is.
3. Humidity sensor that lets it measure how much humidity is in the air.
4. A speaker that allows the car to alert people of important weather information.

User Needs & Requirements

1. **The device will contain at least 2 separate serial sensors that measure a specified aspect of the environment:** The RC car will have access to both a temperature sensor and a humidity sensor to gather this weather data.
2. **The system shall broadcast the environmental data to the internet over WiFi using the MQTT protocol:** The RC boat will have onboard WiFi to upload its weather data through.
3. **The device should be able to reposition itself for the optimization of data collection:** Our Drone motors allow this device to go anywhere to gather weather data.
4. **The device will contain at least one serial actuator and one motor or linear actuator with bidirectional control ability:** Our RC drone uses a motor and a speaker for our actuators.