

# Fire Fighting Robot

## Team: SPARK

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### Abstract

The goal of this project is to design and develop a robot that could be used to lower the number of injuries and deaths from house fires. To accomplish this goal, the robot competed in a on track designed to imitate the layout of a home. The robot began the competition at the sound of a simulated fire alarm. The robot is then notified to leave from its base and extinguish the flame and return to base.

### Problem Statement

The robot needed to meet several goals.

- Start at a 3.8KHz signal and only a 3.8KHz signal
- Autonomously navigate the course at a competitive pace
- Avoid obstacles
- Identify and suppress the flame
- Go back to home base

### Results

- Sensors were calibrated
- Motors were being driven
- All hardware was wired together
- Code was stable

### ACKNOWLEDGEMENTS

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- Enrico Obst
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- Professor Campana

### Design Process

Choose and implement Hardware for robot navigation

Write and implement navigation software

Choose and Implement Fire Detection Capabilities

Add fire suppression capabilities

### HARDWARE

#### Navigation

- Arduino Mega
- Sainsmart L293D Motor Driver
- Four Geared DC Motors
- Microphone
- Mecanum Wheels

#### FIRE DETECTION

- Two Photo-sensor
- Four Ultrasonic Sensors
- Infrared Sensor
- LED Light

#### Software

- Arduino based code

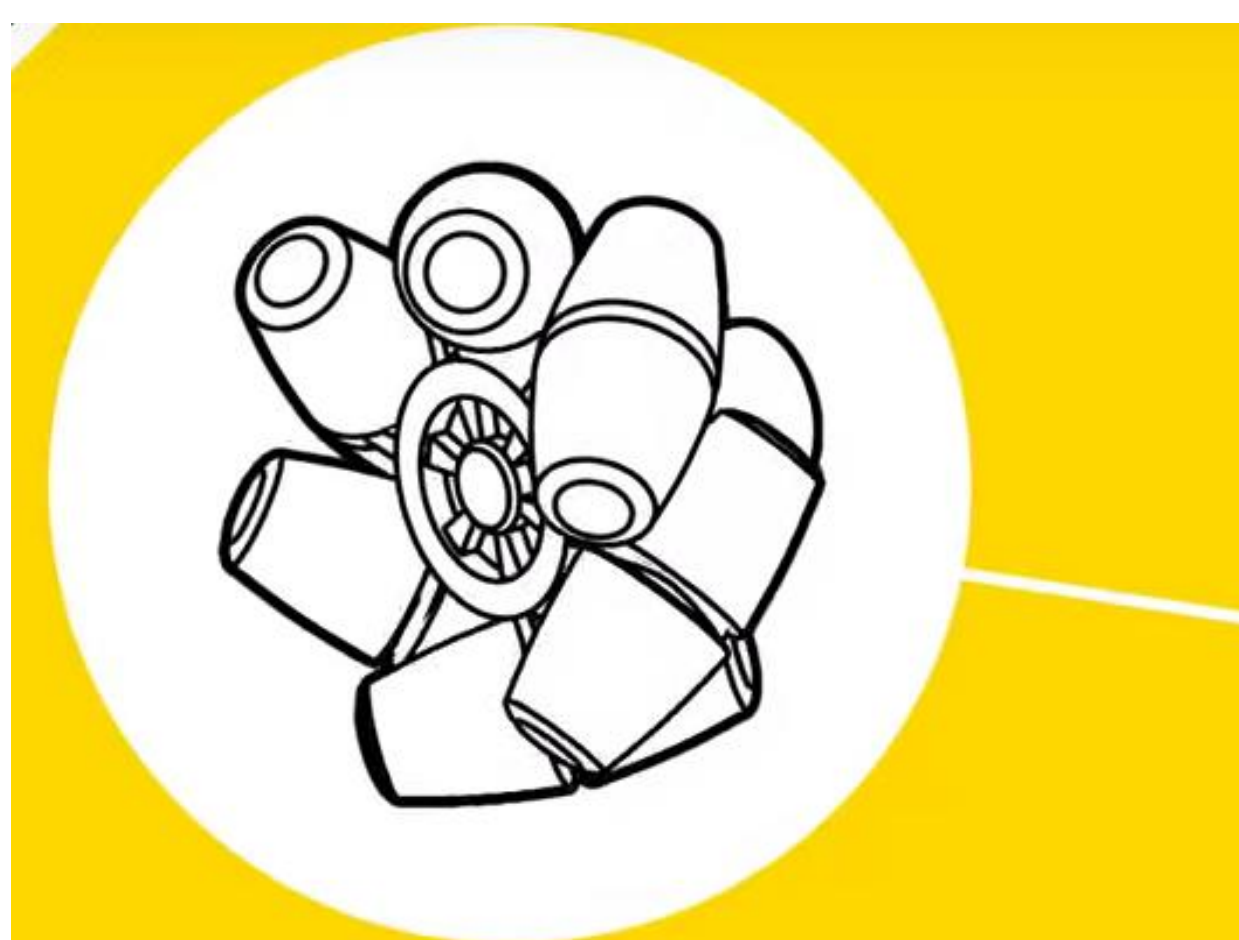
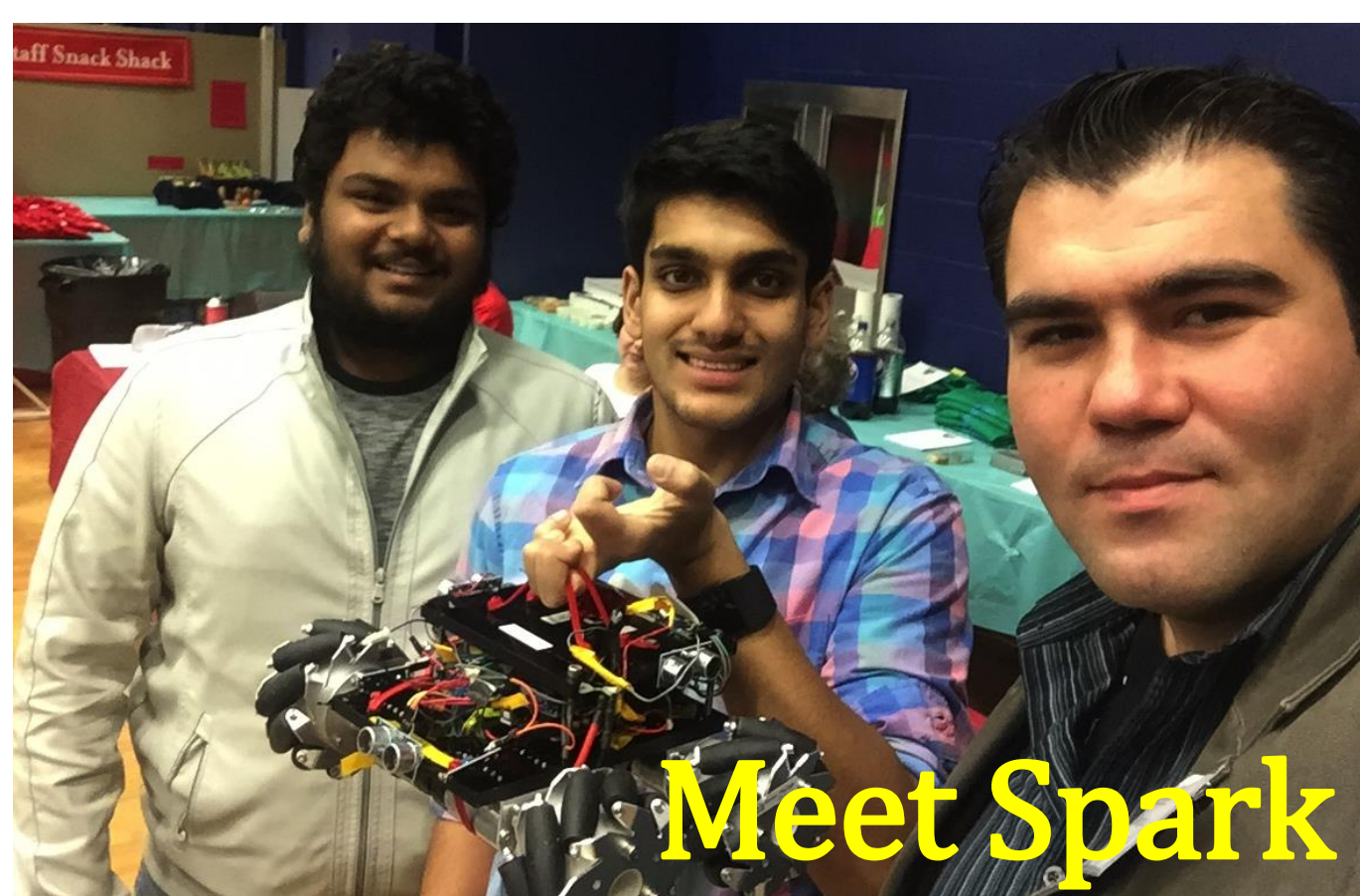
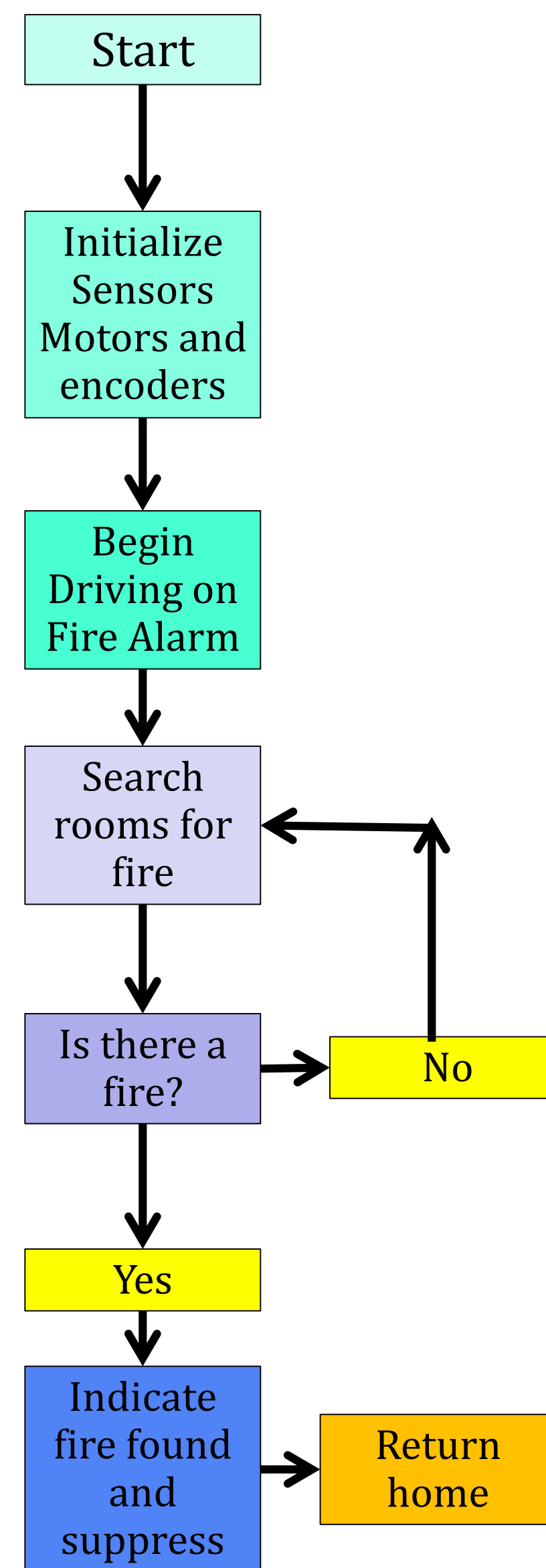
#### FIRE SUPPRESSION

- One DC motor
- Fan
- Two 9-volt batteries

#### Power

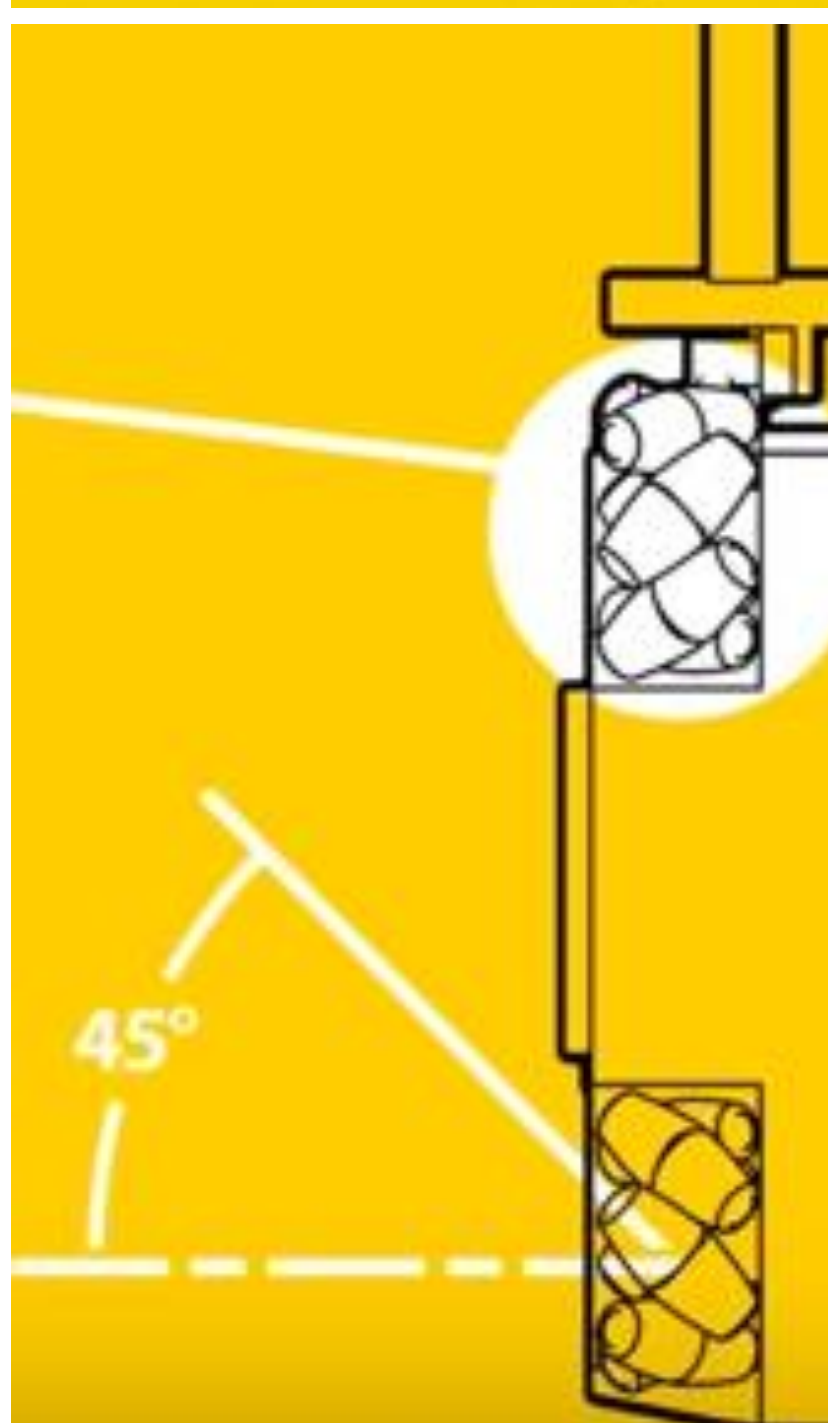
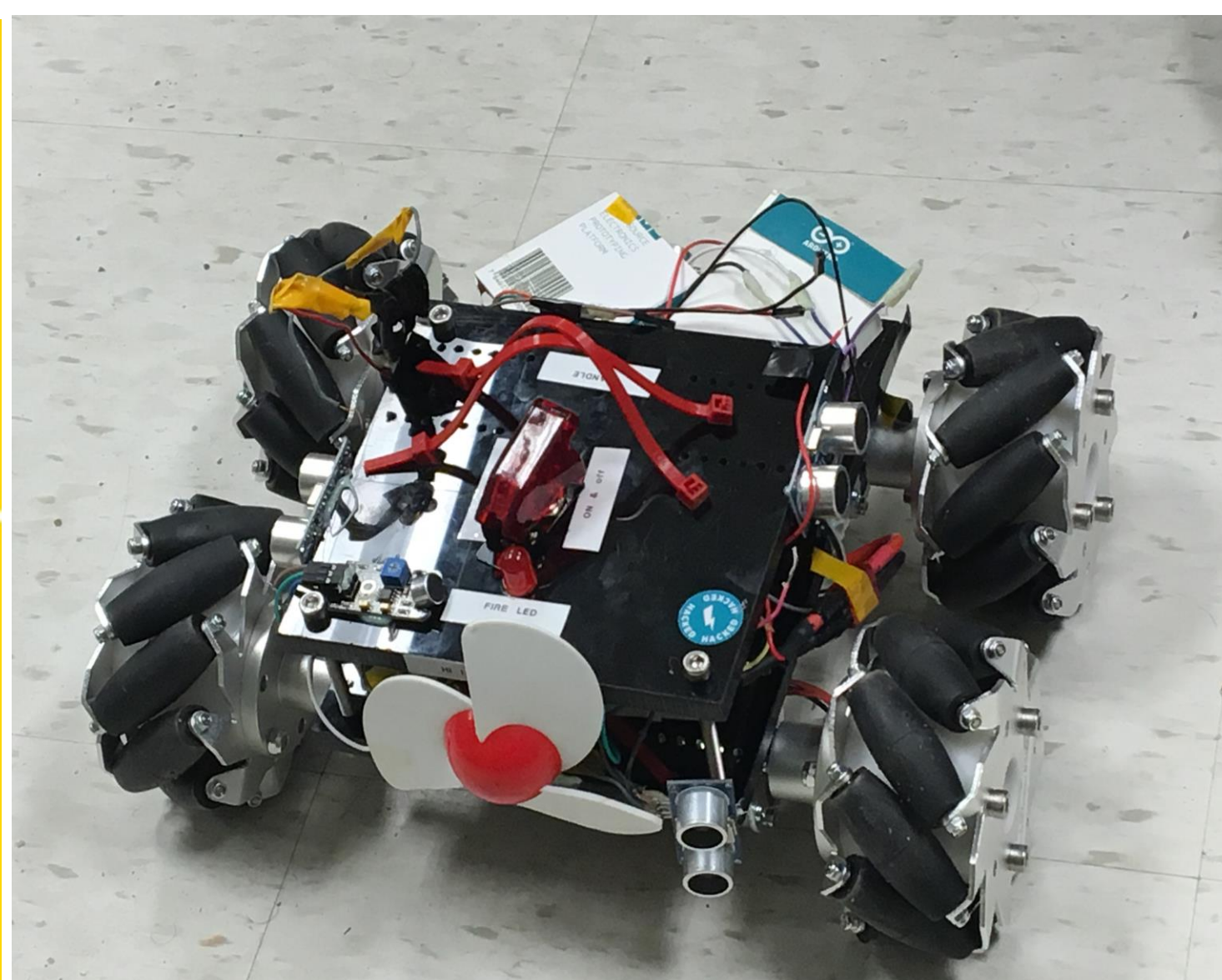
- Two 9-volt batteries
- Two lithium polymer batteries

### Software Logic



### Mecanum Wheels

Perfect for tight spaces, they enable conventional forward & backward movement as well as side to side and even rotation



### Robot Controller

