Fire Suppressing Automated Robot

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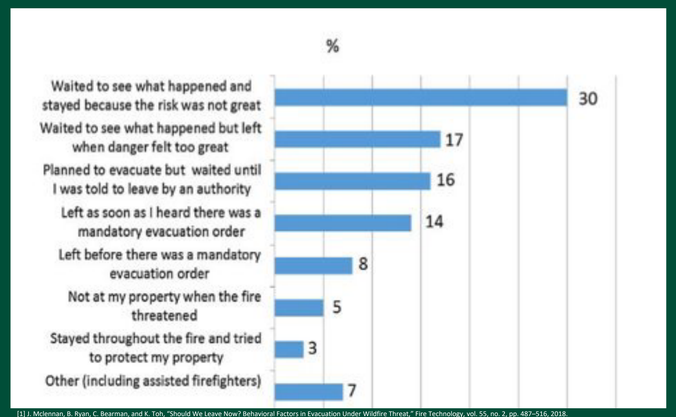
PROBLEM STATEMENT

Our robot is designed to autonomously navigate around a property while spraying fire suppressing material in the surrounding area to help U.S. Residents who live in WUI and delay mandate evacuations when wildfires occur.

Figure 1: The picture shows our device.



[1] J. Mclennan, B. Ryan, C. Bearman, and K. Toh, "Should We Leave Now? Behavioral Factors in Evacuation Under Wildfire Threat," Fire Technology, vol. 55, no. 2, pp. 487–516, 2018.

Figure 2: The graph above shows how WUI U.S. Residents respond to wildfires.

BACKGROUND

The increase of wildfires due to climate change leave people who live in Wildland-Urban Interfaces in danger. However, many residents try to defend their property before leaving, as shown the figure 2 above. Our design eliminates the house owner's need to stay while a mandate evacuation is present. A person can simply turn on our device and leave to a safe area. The device will roam the property in a predetermined path while spray fire suppressing material in the surrounding area.

SUMMARY OF WORK

The fall semester, our team worked together to define a societal problem, create a solution, and implement our design. We broke our design into three feature sets, the device mobility, the spray nozzle, and the automated refill function, which we successfully executed. For the spring semester, we implemented autonomous mobility and integrated our three features as one device.

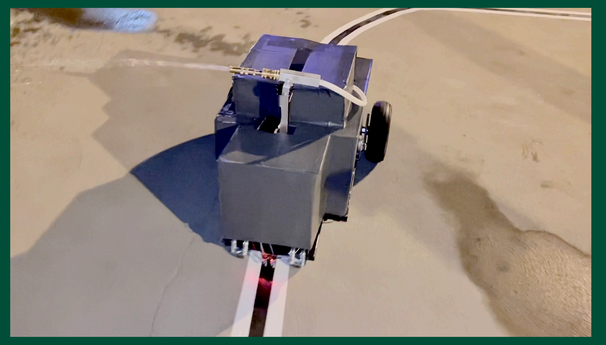


Figure 3: The device following a predetermined line and spraying water.

Figure 4: The back of the device.

IMPACT ON COMMUNITY

We believe our product benefits the WUI community in the following areas:

- Government officials in charge of evacuating residents have less to worry about.
- Damage done to the property due to fires is significantly decreased which means valuable items are saved and people incur less financial loss.
- People have more time to evacuate and place themselves in a safe location.