THE ADA RESCUE BOT

Andrea Ananos, Angel Macias, Diego Segura
Dr. Hanqi Zhuang

FAU
College of Engineering & Computer Science
Florida Atlantic University

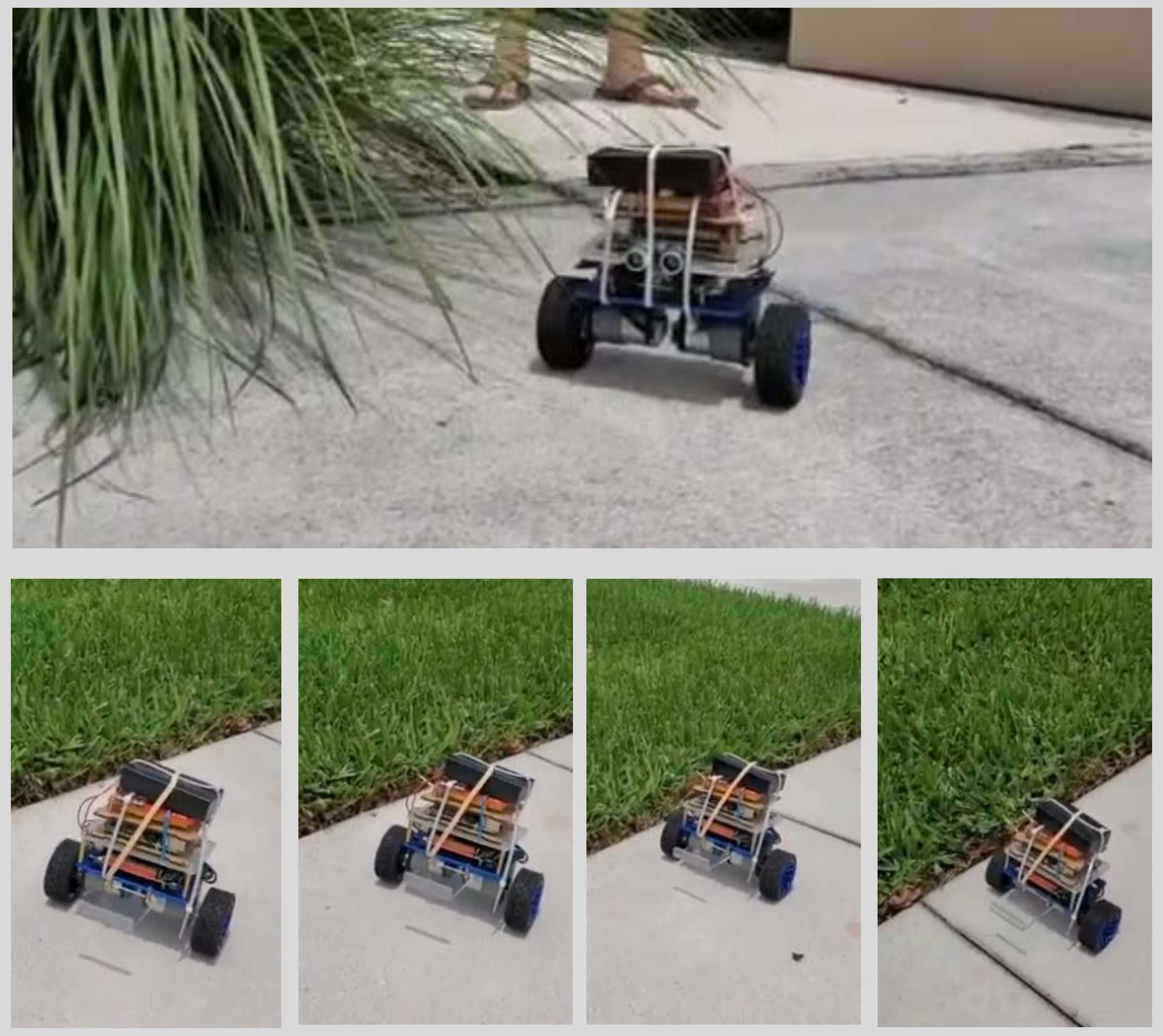
ENG 4952C

Introduction

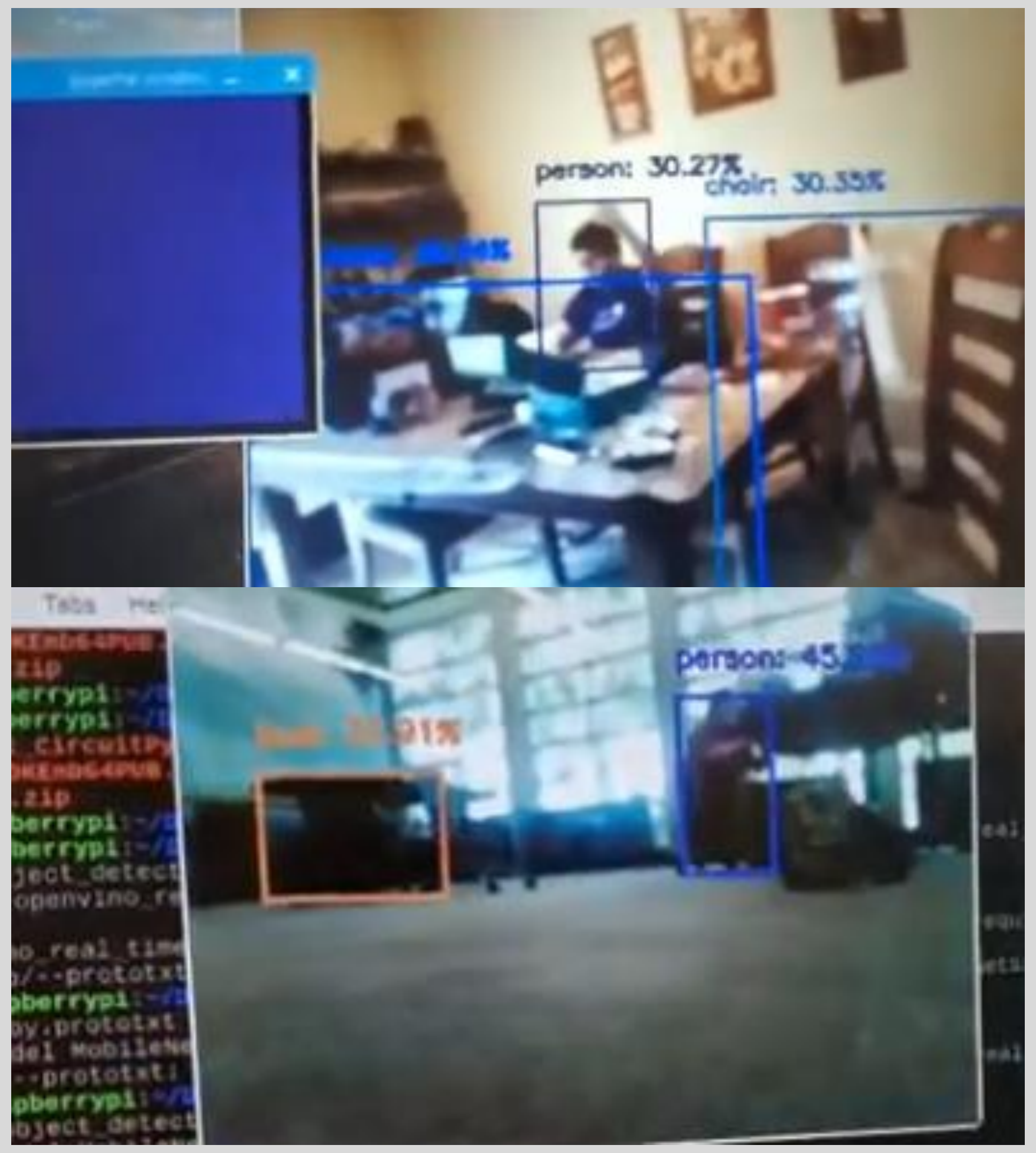
Our ADA Rescue bot is designed to search and aid in the rescue of endangered lives. While preventing the physical strain and potential life danger of a search and rescue team. In order to achieve our goal we went for a compact design that would facilitate it to travel in hard to reach places. The self-balancing feature we added, aids on its navigation and camera stability. Navigation can be remote or by auto-pilot. The rescue bot features two cameras, one that is capable to stream real-time footage that goes through image processing and a thermal camera that aids on recognizing different temperatures around it. The rescue bot would facilitate a rescue team to pin point the location of people by giving the GPS location of the place it recognized a human.

Relevance

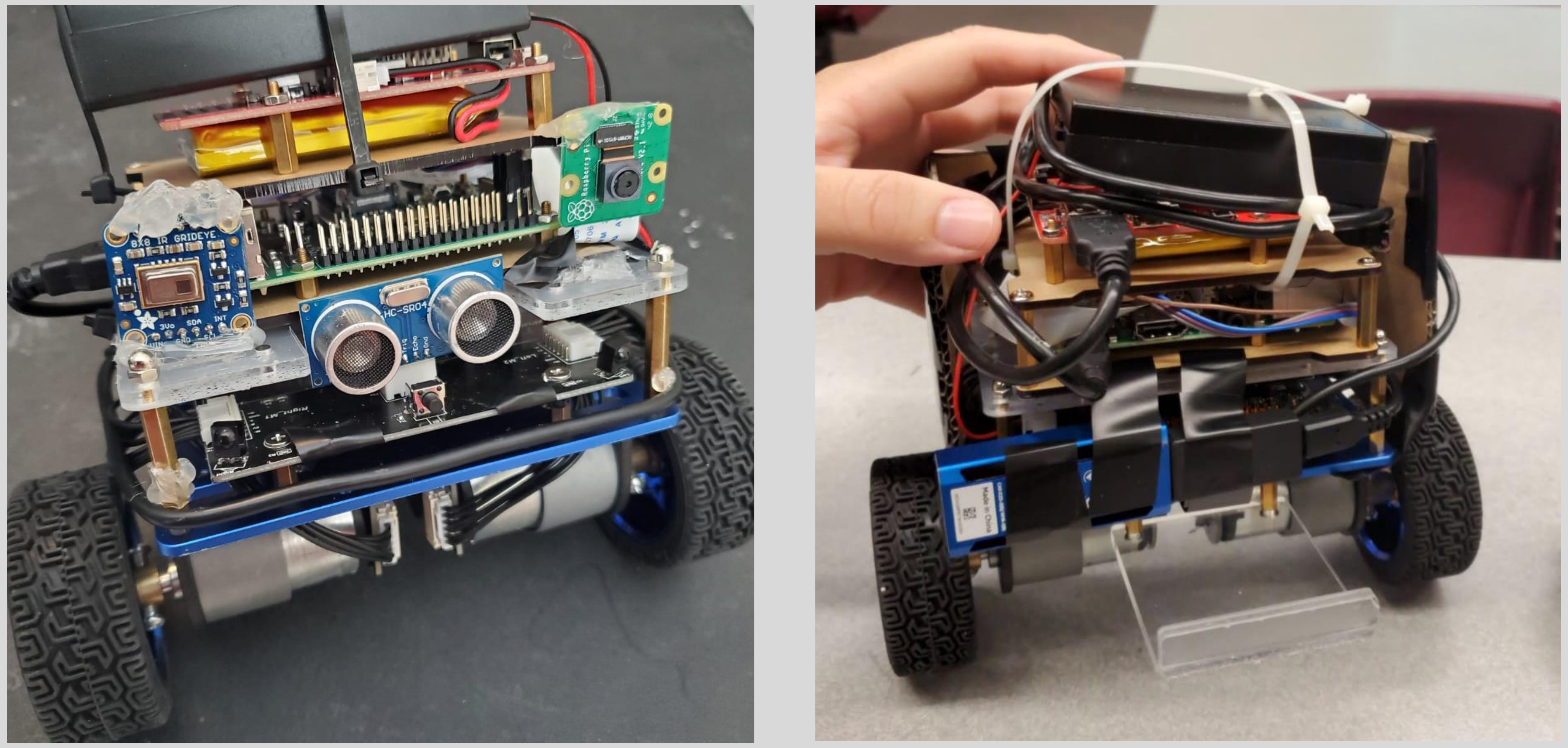
The world is full of unfortunate catastrophes and anyone of us can be in the wrong place at the wrong time. One aspect of our planet that we haven't been able to control is Mother nature. We can try our best to prepare the population as to how to act during and after a natural disaster, but most of the aftermath of natural disasters remain unpredictable. We wanted to provide a tool that would aid rescue teams and provide added assurance to those who are in such dangerous situations.



The rescue bot remaining self-balanced while on auto-pilot mode. Also doing obstacle avoidance.



The rescue bot displaying its ability to recognize humans and distinguish them from objects.



The inside of the rescue bot, front and back. Everything is placed so it won't interfere with the self-balancing capability of the bot.

Approach

A Raspberry Pi B+ model will be used alongside a Pi Camera, AMG88xx thermal camera, Intel Compute stick and GPS module. All of it is part of our image processing and video streaming feature that would facilitate the search for life. An Arduino nano is utilized in order to control the two GB37 DC motors, the MPU-6050 (Gyro & Accelerometer) for self-balancing and the HC-SR04 ultrasonic sensor for obstacle avoidance. In order to give power to the two microprocessors we used 2 different LiPo batteries. In the software side, we coded on Python3 for Raspberry Pi and in Arduino IDE for Arduino. First, we focused on streaming video feed, then we trained the intel stick to recognize humans and other objects. The image processing was then applied onto the streaming footage. For the movement we used two motors alongside the MPU-6050. It features 3 cases: IDLE, Auto-pilot and Remote. The bot will remain IDLE and self-balancing until you press the button for Auto-pilot.

Acknowledgements

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References

"Intel® Compute Stick." *Intel*, www.intel.com/content/www/us/en/products/boards-kits/compute-stick.html.