Development of an Autonomous Aerial Vehicle Using Computer Vision and Artificial Intelligence to Assist First Responders in Dangerous Situations

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According to a World Health Organization report, every year natural disasters kill around 90,000 people and affect close to 160 million people worldwide. Natural disasters include earthquakes, tsunamis, volcanic eruptions, landslides, hurricanes, floods, wildfires, heat waves and droughts. Time is of the essence as the chance of survival starts to go down with every minute that passes. First responders can have trouble locating survivors in houses that are damaged and put their life at risk while looking for them. During this project, a system was designed which was able to remotely locate people and greatly increase the speed at which first responders were be able to evacuate them from buildings.The combination of depth cameras along with a special infrared cameras can allow for accurate tracking of the indoor area and detection of temperature changes representing fire, people, and animals. The custom software uses AI algorithms to access the point cloud and through localization, create a map of the entire space surrounding the device. Once the system is launched and begins scanning, it will travel through hallways and find entrances to other rooms where it can then do a sweep of the room specifically looking for people. The system repeats this process until all of the rooms have been scanned. Currently, the quadcopter can fly for around 10 minutes which is enough to do a full sweep. The first responders will get notifications when people are spotted so that they can focus their efforts on the select buildings.

Awards Won:

Third Award of $1,000

International Council on Systems Engineering - INCOSE: Certificate of Honorable Mention