

**POST-DISASTER RECOVERY BY RAPID HIGH RESOLUTION AERIAL IMAGING AND INDOOR 3D  
MAPPING WITH AUTONOMOUS QUADROTOR UAVS DRIVEN BY COMPUTER VISION FEATURE  
TARGETING AND REAL-TIME VICTIM RECOGNITION**

## Executive Summary

We built an autonomous drone for under \$500 to help save thousands of victims of floods, earthquakes, hurricanes and other disasters by automatically searching for victims, both indoors and outdoors. Our drone produces aerial maps that are *10 times higher resolution* than the best commercial satellite maps in the market, allowing disaster responders to **prioritize search and rescue efforts and assess the extent of damage after a disaster**. Victims are automatically recognized by the drones and are tagged for rescue. Each drone collaborates with other drones in its network to map a city rapidly.

A version of the drone can navigate around the inside of a building, producing a 3D map of the interior of a building that may be too dangerous to enter. A victim inside a collapsing building can be located, potentially saving the life of an EMT or firefighter.

Recent disasters where this technology would have been applicable to post-disaster response are Hurricane Sandy, the Fukushima Nuclear Disaster and the Boston Marathon bombing by automatically searching for victims, entering a radioactive hazard zone or searching for the perpetrators.

*Figure 2: Generated 3D indoor model*

*Figure 1: Panoramic image from above rooftops*



*Figure 3: Full panorama from a backyard sweep*

