



Deep Learning Image Classification for Disaster Relief

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Abstract:

The aftermath of natural disasters leaves communities across the nation devastated for years after they occur. When communication systems go down, natural disasters become much more dangerous. Those who live in rural areas have an increased risk of supplies shortage because there are less stores with vital supplies (such as food and water). Furthermore, roads to stores with these supplies may be inaccessible. Utilizing recent advancements in artificial intelligence and consumer drone technology, we design a swarm of drones capable of identifying locations with inaccessible roads and post these locations to a virtual map. Those involved in the relief efforts would have access to this virtual map, and residents in need can be reached in a more efficient manner. The main result of our work is the design of a system of drones that stream their camera feeds to a base computer, and the use of the deep learning image classifier to process this data in real time. The design of this disaster relief system must be mobile. Drones must be capable of flying for at least 20 minutes and minimum range of 1 mile. The image classifier will be designed in MATLAB and implemented in Python. A virtual map will be designed using a reliable set of web technologies called a MEAN stack. The acronym MEAN stands for MongoDB(a non-relational database), embedded JavaScript(used for making HTML dynamic), Angular JavaScript (logic for making webpage interactive), and Node JS (A runtime environment similar to the Java Virtual Machine).

Key Words: Artificial Intelligence, Image Classifier, Drones, MATLAB, Python, Natural Disaster

