Title: Natural Disasters Intensity Analysis and classification using AI
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Project Flow

- Aerial imagery captured via unmanned aerial vehicles (UAVs) is playing an increasingly important role in disaster response.
- Unlike satellite imagery, aerial imagery can be captured and processed within hours rather than days.
- In addition, the spatial resolution of aerial imagery is an order of magnitude higher than the imagery produced by the most sophisticated commercial satellites today.
- Both the United States Federal Emergency Management Agency (FEMA) and the European Commission's Joint Research Center (JRC) have noted that aerial imagery will inevitably present a big data challenge.
- The purpose of this article is to get ahead of this future challenge by proposing a hybrid crowd sourcing and real-time machine learning solution to rapidly process large volumes ofaerial data for disaster response in a time-sensitive manner.
- Crowd sourcing can be used to annotate features of interest in aerial images (such asdamaged shelters and roads blocked by debris).
- These human-annotated features can then be used to train a supervised machine learning system to learn to recognize such features in new unseen images.
- In this article, we describe how this hybrid solution for image analysis can be implemented as a module (i.e., Aerial Clicker) to extend an existing platform called Artificial Intelligence for Disaster Response (AIDR), which has already been deployed to classify microblog messages during disasters using its Text Clicker module and in response to Cyclone Pam, a category 5 cyclone that devastated Vanuatu in March 2015.
- The hybrid solution we present can be applied to both aerial and satellite imagery and has applications beyond disaster response such as wildlife protection, human rights, and archeological exploration.

- As a proof of concept, we recently piloted this solution using very high-resolution aerial photographs of a wildlife reserve in Namibia to support rangers with their wildlife conservation efforts

- The results suggest that the platform we have developed to combine crowd sourcing and machine learning to make sense of large volumes of aerial images can be used for disaster response.