



Award #: 1835473

CSSI Element: Data: Integrating Human and Machine for Post-Disaster Visual Data Analytics: A Modern Media-Oriented Approach

PIs: Shirley Dyke, Co-PIs: Thomas Hacker, Bedrich Benes

PhD Students: Jongseong Choi, Zhiwei Chu, Xiaoyu Liu, Xin Zhang



MOTIVATION

Civil Engineers collect tremendous amounts of post-disaster images after natural disasters.

The complexity and large scale of collected visual data make it difficult to quickly and thoroughly categorize images based on content and location.

Problem: How can researchers sort through and effectively distill understanding from a tremendous amount of visual data?

GOALS

- Visual analytics image classifier and report generator for civil engineering.
- Automate the process of sorting through the thousands of images collected of the built environment after a natural disaster.
- Create a comprehensive cloud-based data analytics service based on **data-as-a-service & applications-as-a-service**.

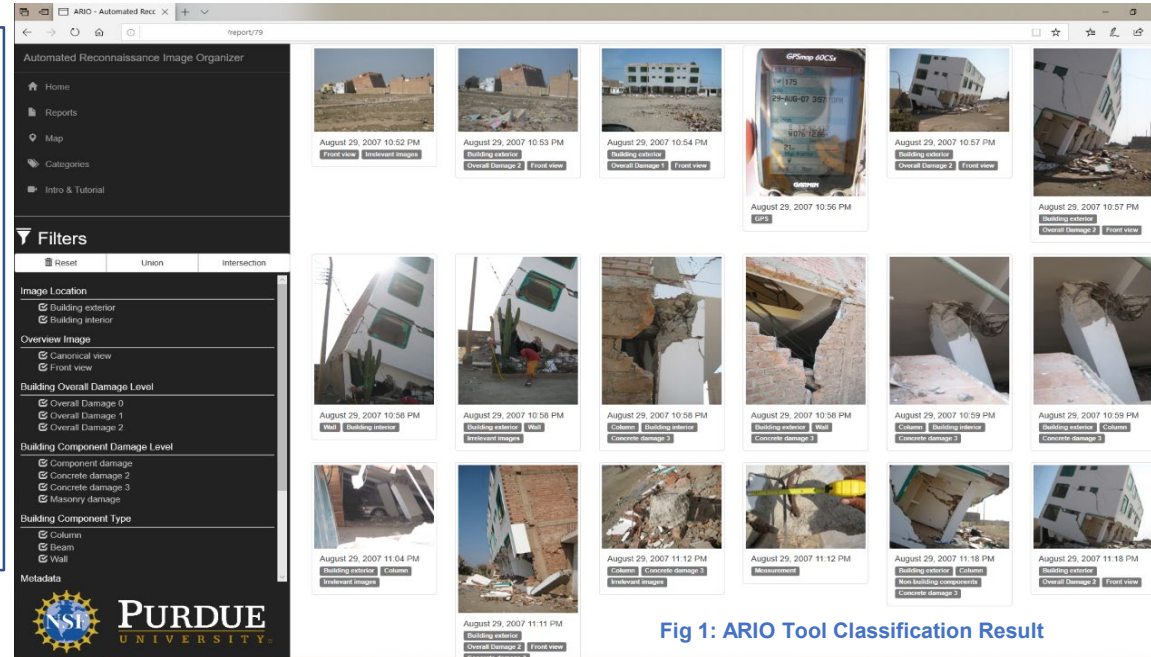


Fig 1: ARIO Tool Classification Result

APPLICATIONS-AS-A-SERVICE

- Provide service to rapidly classify and analyze large collections of images.
- Provide similarity-based visual search capability.
- Provide an application that can leverage existing pre-disaster imaging (i.e. Google Street view) for pre-event context.

DATA-AS-A-SERVICE

- Provide a “ground truth” collection of images for classification.
- Develop an image classification taxonomy appropriate for the civil engineering domain and the types of images collected after an event.
- Develop an annotation tool to allow the community to add notes to images.

CLOUD INFRASTRUCTURE

Create secure distributed network communication zones and centrally managed data-backbones.

Create ephemeral computing service framework that provides data-as-a-service and applications-as-a-service.

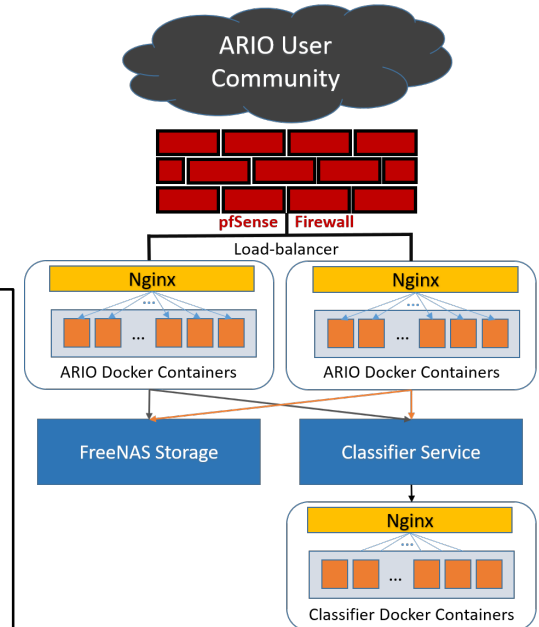


Fig 2: System Structure Illustration