→ THE ESA EARTH OBSERVATION Φ-WEEK

EO Open Science and FutureEO

12–16 November 2018 | ESA–ESRIN | Frascati (Rome), Italy

Improving Crisis Event Management through EO & Citizens' Voluntary Engagement

Refiz Duro

14/11/2018

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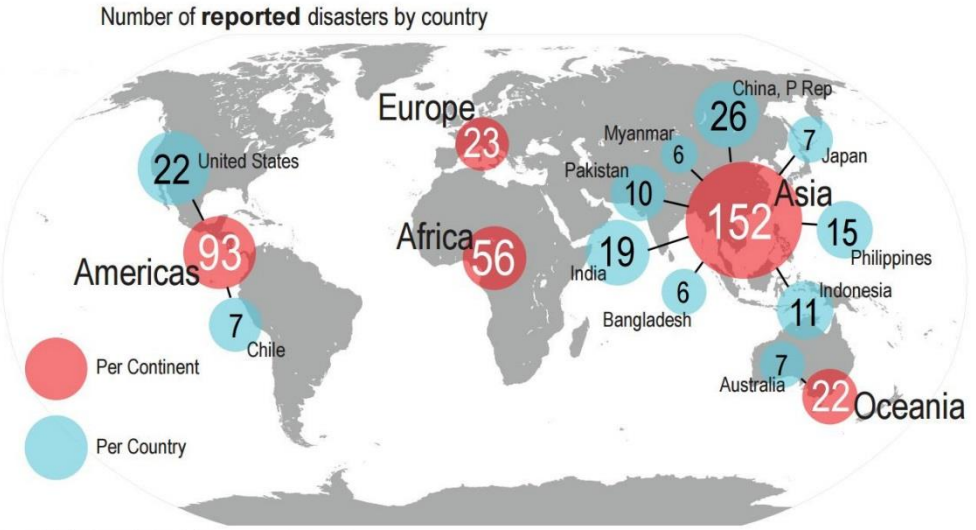
Crisis and Disasters – Numbers (2015)



(1): Natural disasters: Epidemic and insect infestations not included

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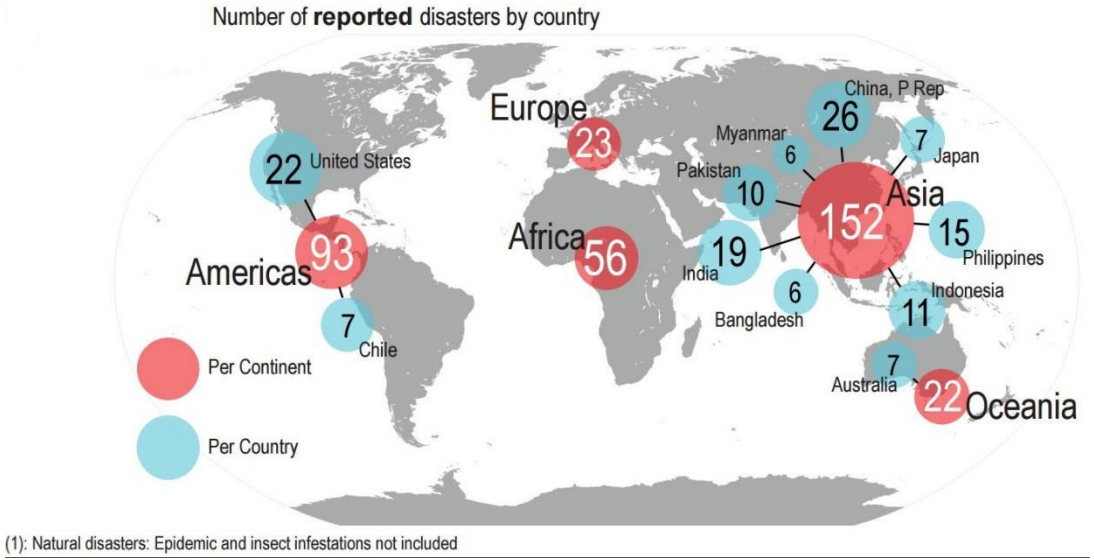

- 346 reported disasters
- 22 773 people dead
- 100 million people affected
- $66.5 billion economic damage

Crisis Management – Acquiring Data/Information

Telephone, fax, social media, e-mail

[slow, manual, prone to errors]

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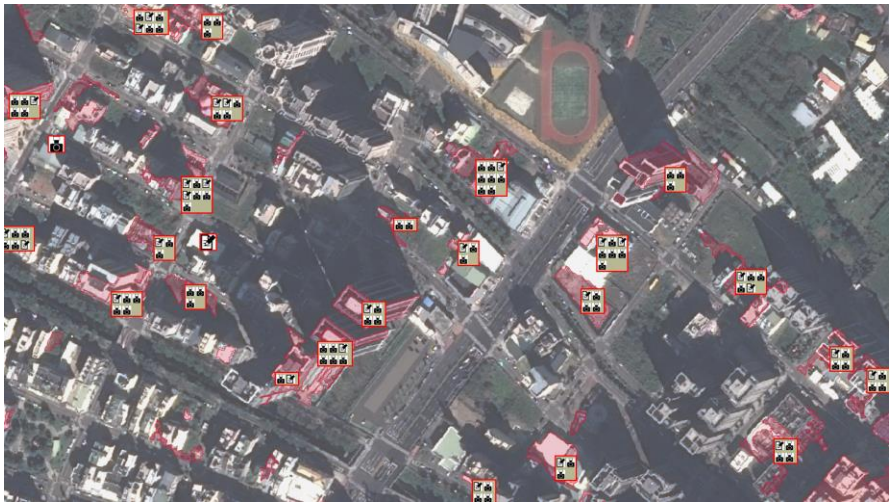

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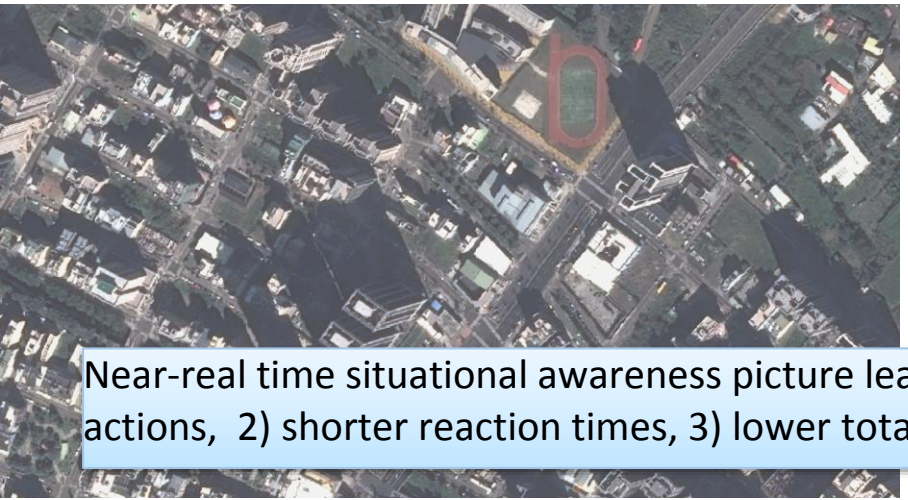
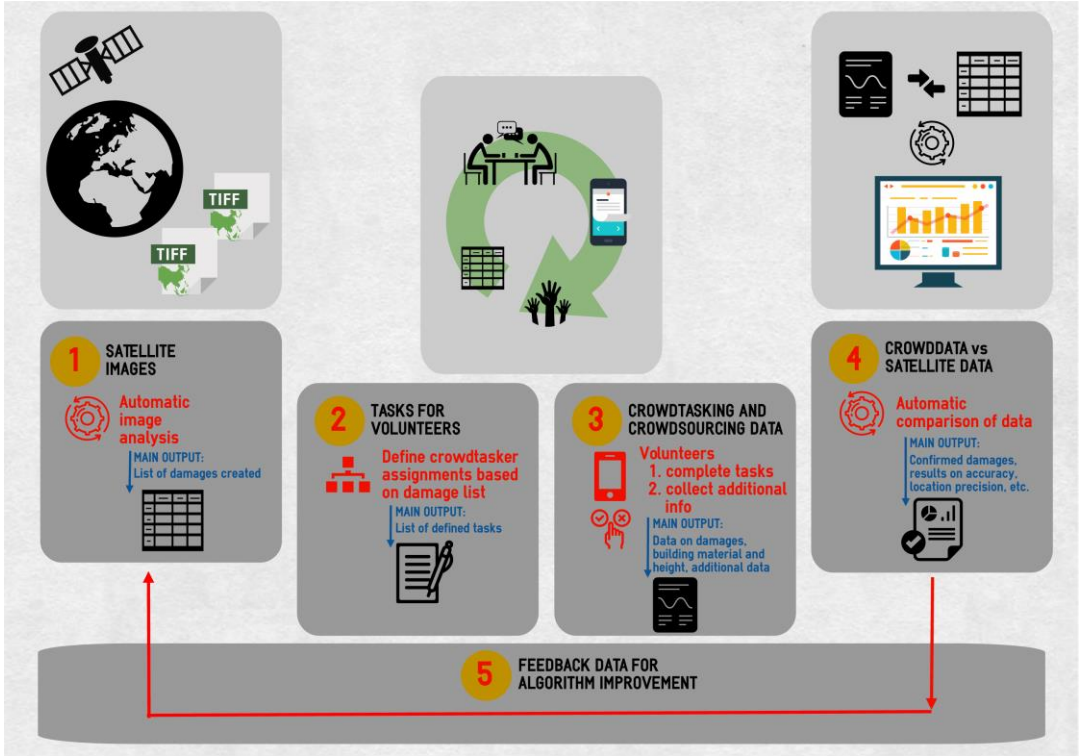


Near-real time situational awareness picture leading to: 1) smarter resource allocation and response actions, 2) shorter reaction times, 3) lower total costs for relief actions.

QuinJunSAT Approach



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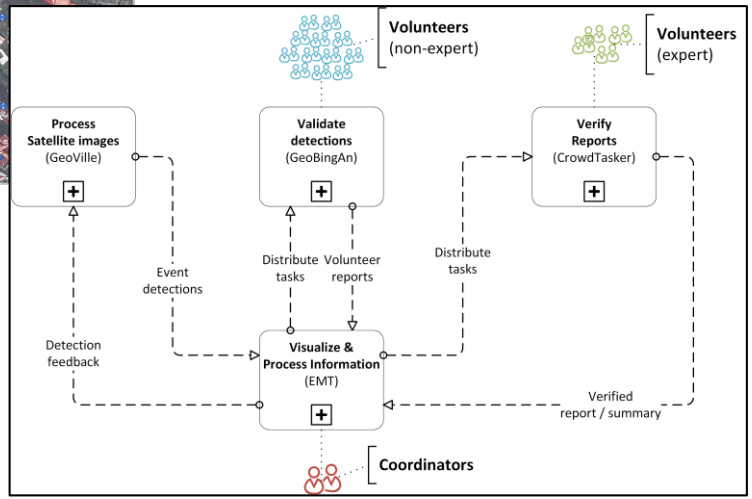
The Way of Data & The Tools

Rapid Assessment System



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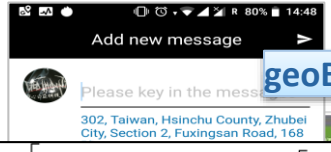
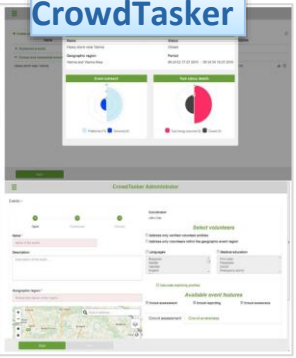
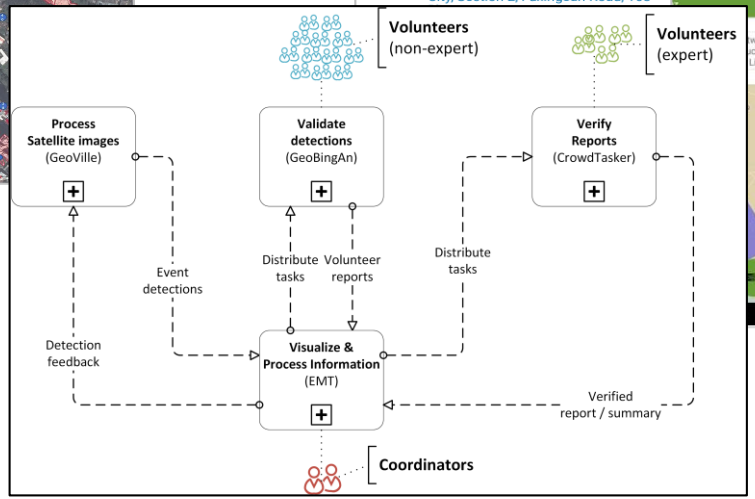


geoBingAn



CrowdTasker



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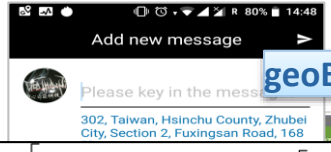

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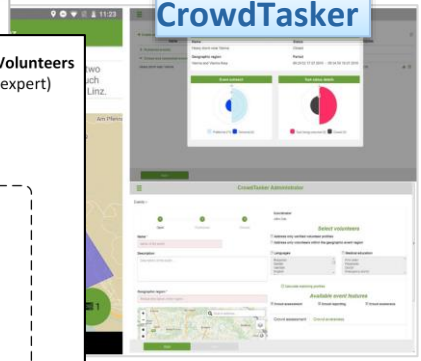

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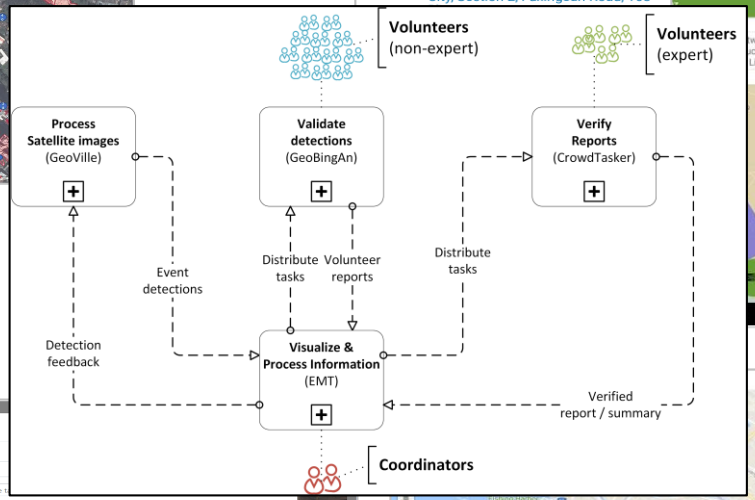

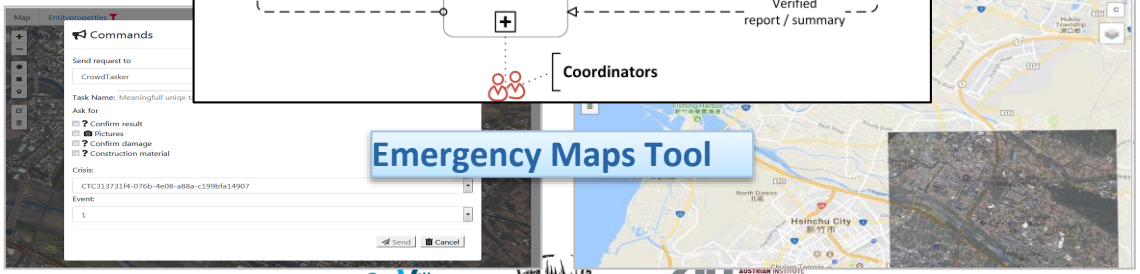

Emergency Maps Tool

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Taiwan Drill Day

- “921 International Disaster Prevention Drill” is an annual set of events across the whole Taiwan, commemorating the devastating earthquake on 21st September, 1999.
- More than 2,000 lives were lost, damaging tens of thousands of buildings and destroying infrastructure.

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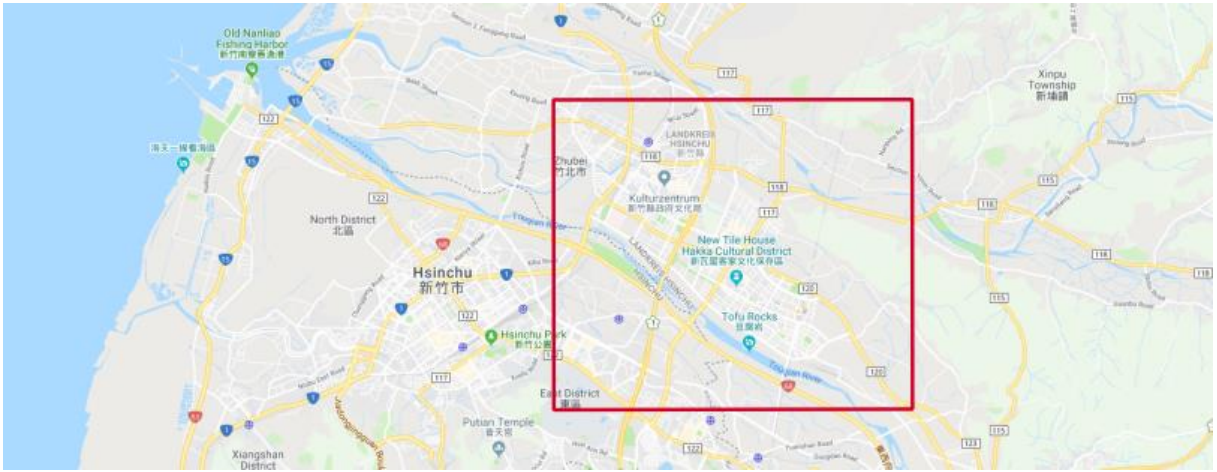
- More than 2,000 lives were lost, damaging tens of thousands of buildings and destroying infrastructure.
- **Include technological advancements for the damage detection / data collection for rapid assessment & creation of a crisis picture:**
    - **Satellite Technologies (from above)**
        - *Very high resolution imagery (sub-meter)*
    - **Crowdsource Data (from the ground)**
        - *Smartphone Apps for crowdtasking (geoBingAn, CrowdTasker)*
    - **Crisis Mapping**
        - *Emergency Maps Tool for decision making support*

Taiwan Drill Day

- Hsinchu County in Taiwan
- Disaster Prevention and Resilience Center
- Crisis responders & managers, volunteers



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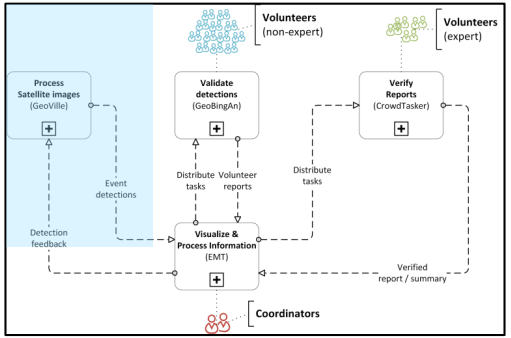

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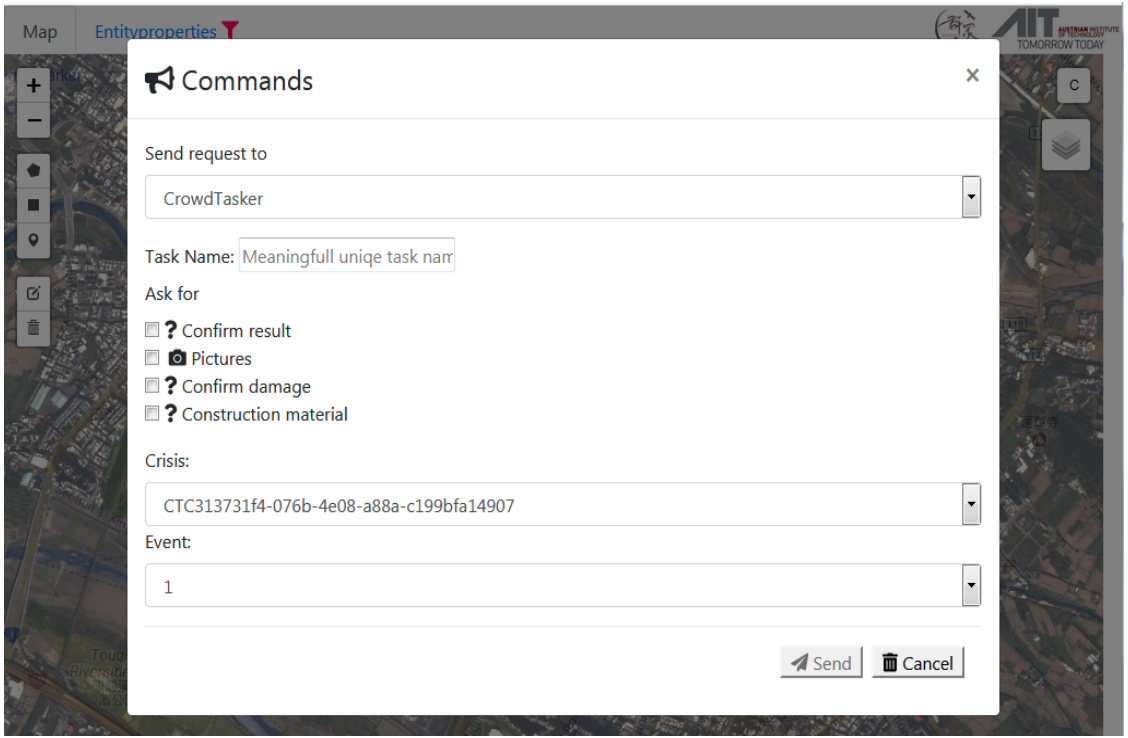

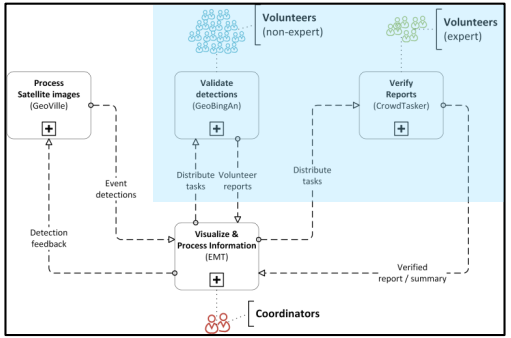

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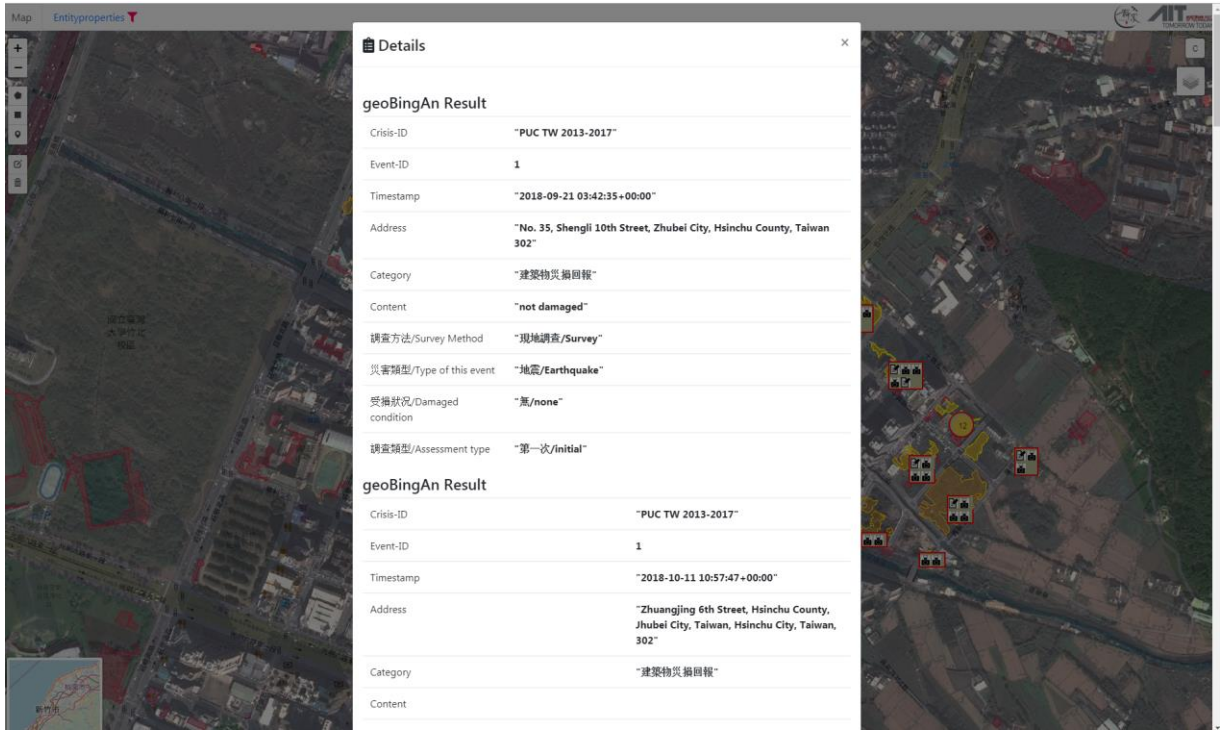

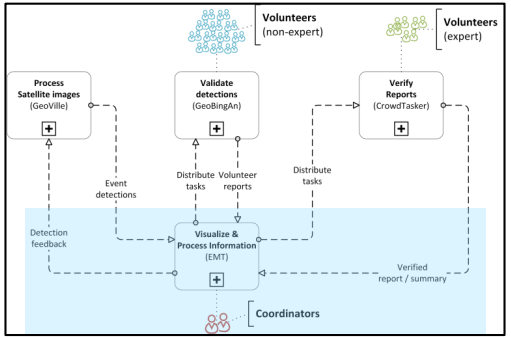

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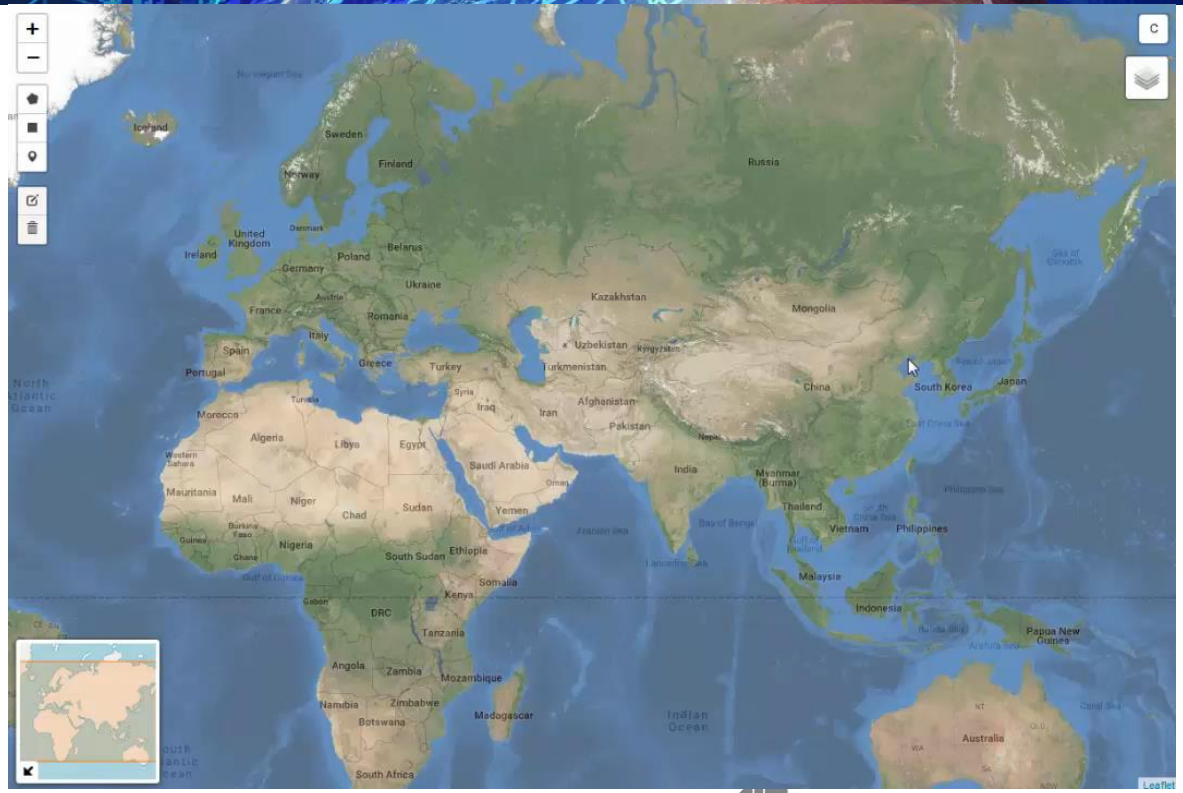
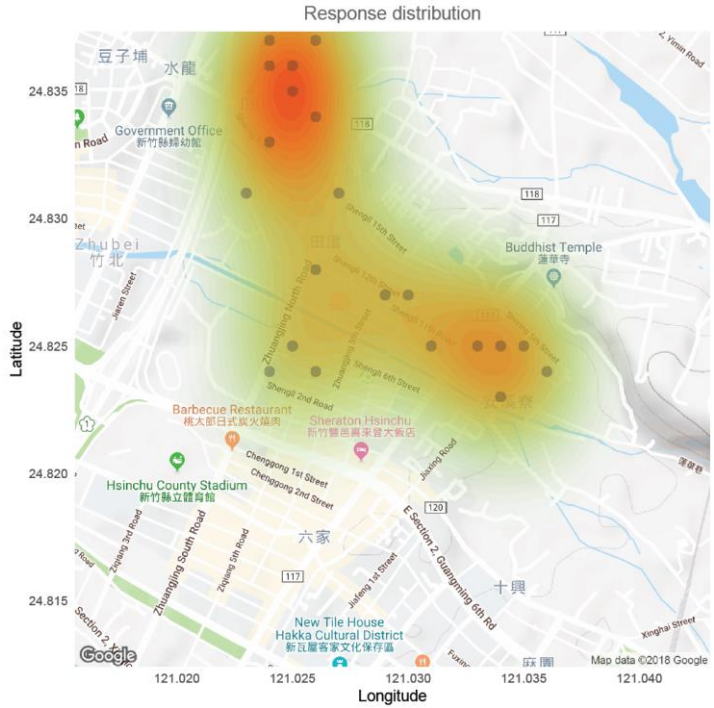
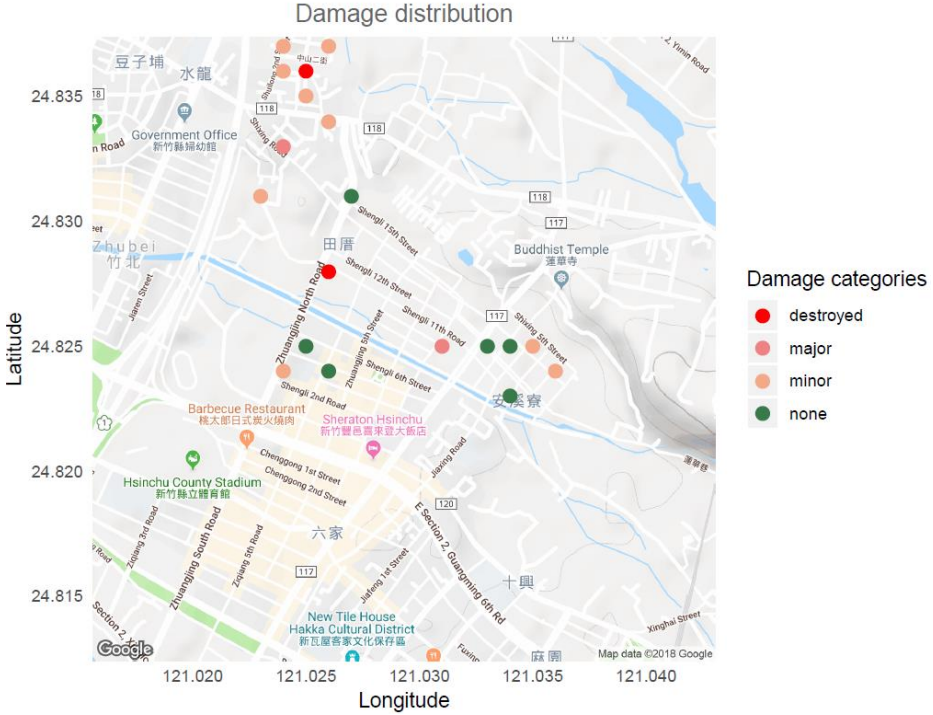


Taiwan Drill Day - Results





Lessons Learned & Future Steps

Satellite data:

- Temporal resolution is currently too sparse as they are not meeting the crisis & disaster criteria
    - Much better temporal resolution in near future (daily coverage to multiple images per day) + tasking capabilities -> *integrate it in the pipeline for near-real time view*
- Difficult to apply the same damage detection algorithm to different types of cities/places (e.g., Katmandu vs Taipei) -> *combine with crowdsourcing and state of the art (detection) algorithms*

Crowdsourcing/crowdtasking:

- Getting sufficient number of volunteers is critical
- Different types of data can be gathered depending on the disaster (e.g., building height, material, flood water color, smell, etc.) -> *flex the Apps for all crisis event types*

Conclusions

Combination of EO, Crowdsourcing, Volunteers & Crisis Managers give you near-real time situational awareness picture potentially leading to:

- smarter resource allocation and response actions
- shorter reaction times
- lower total costs for relief actions.

Thank you!

quinjunsat.info

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[1] AIT Austrian Institute of Technology GmbH
[2] GeoVille Information Systems and Data Processing GmbH
[3] GeoThings Inc.

The developments described are carried out within the QuinJunSAT research project funded by the Austrian Research Promotion Agency (FFG) in the frame of the Research, Technology & Innovation (RTI) initiative “Beyond Europe”.

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