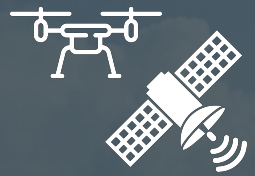
Natural disaster assessment using AI

Natural disasters provide many challenges to governments and rescue services. Currently assessment of natural disasters is done manually or with an AI to a very limited extend. We propose AI powered analytics tool that help to provide humanitarian assistance and disaster recovery.

Our GeoAI App...

... provides **quickest way** to **assess damage** after natural disaster.



... leverages drone, satellite and SAR data

- **data fusion**
- works during any weather conditions
- drones are versatile

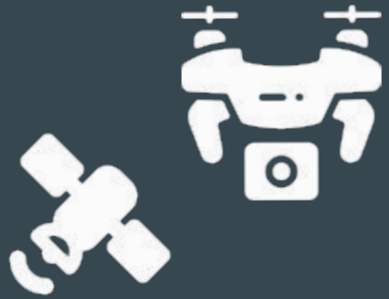
... pinpoints **destroyed buildings** and people that are potentially trapped in them.

... is designed for **emergency management**

... provides **optimal routing** for emergency services

avoiding destroyed/flooded roads

Real Life Implementation



1. Collect Data

- Airbus SAR Satellites
- Drones

→ **Any weather** and terrain conditions

2. AI Analysis

- **Model fine-tuned** on natural disaster dataset
- Automated description and annotation

3. Decision making

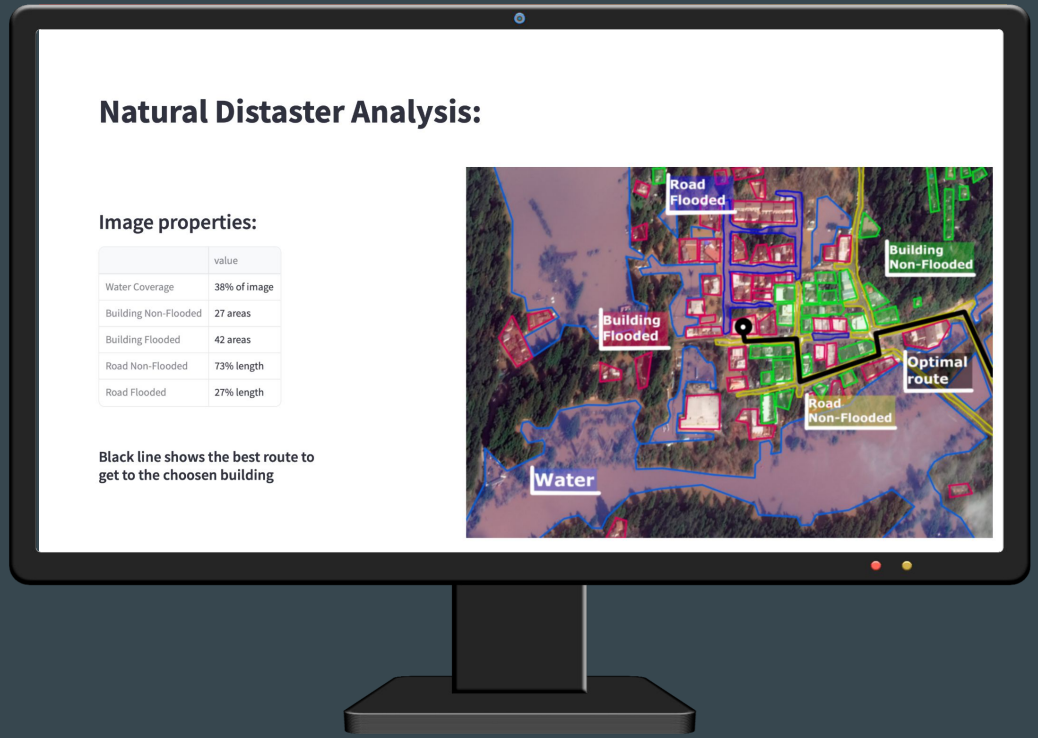
- Best route to given destination

→ Handling **other disasters** in the future!

Clear information about the disaster area

We propose the **web app**, that provides **clear information** about the state of the area, by supplying:

- State of houses
- State of roads
- Flooded area
- Optimal route



Drives critical decision making

Foundation model fine-tuning to assess building damage after natural disasters

NO DAMAGE

Undisturbed.

MINOR DAMAGE

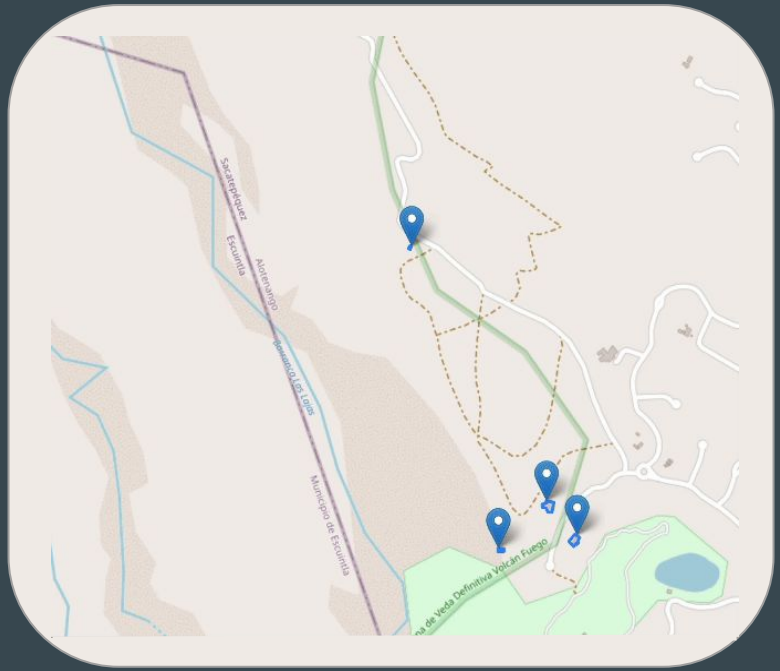
Building partially burnt, water surrounding the structure, volcanic flow nearby, roof elements missing.

MAJOR DAMAGE

Partial wall or roof collapse, encroaching volcanic flow, or the structure is surrounded by water or mud.

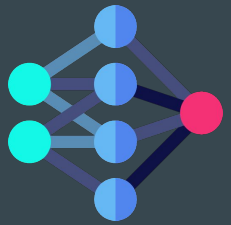
DESTROYED

Structure is scorched, completely collapsed, partially or completely covered with water or mud.

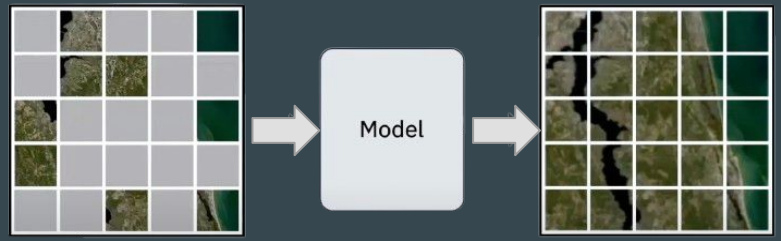


Model details

Model based on **transformer** architecture.



We leverage **self-supervised pre-training** reducing the amount of needed labeled data.



input output

Our model achieves **94.34% accuracy** on a test set after fine-tuning!

Conclusions

Our solution:

- Completely new product that takes to the **next level emergency management**.
  - for governments
  - for rescue services
- Uses ML to automatically find destroyed buildings and infrastructure.
- Provides **valuable information** about natural disasters in the most crucial moments.
- Enables **quick response** to ones that need it the most.
- **Mitigates** analytical **bottleneck** in the post-disaster workflow.
- Ready to handle **new types** of disasters.

Our goal is to save lives!