Quaker Oats: Interactive Worldwide Earthquake Analysis

Anh Hoang, Himani Deshpande, Nahyun Kwon,
Aniruddha Srinivasan, Jose Isimeme, Duy Pham

What?

What is our project?

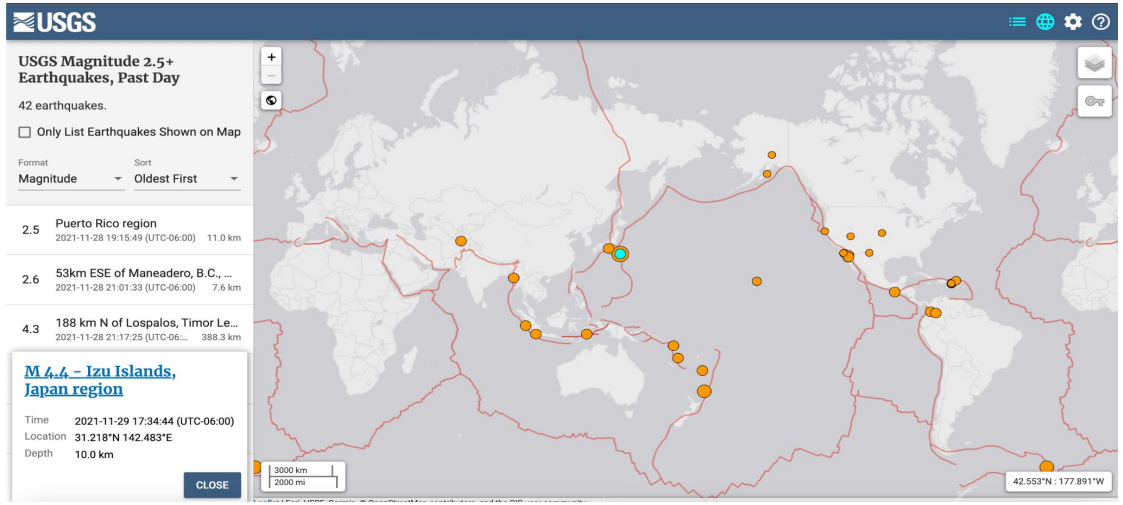
An application that provides earthquake information visually to novice viewers and teach about the phenomenon, providing context to the human costs and related effects in an end-to-end tool.

Who?

Who is our target audience?

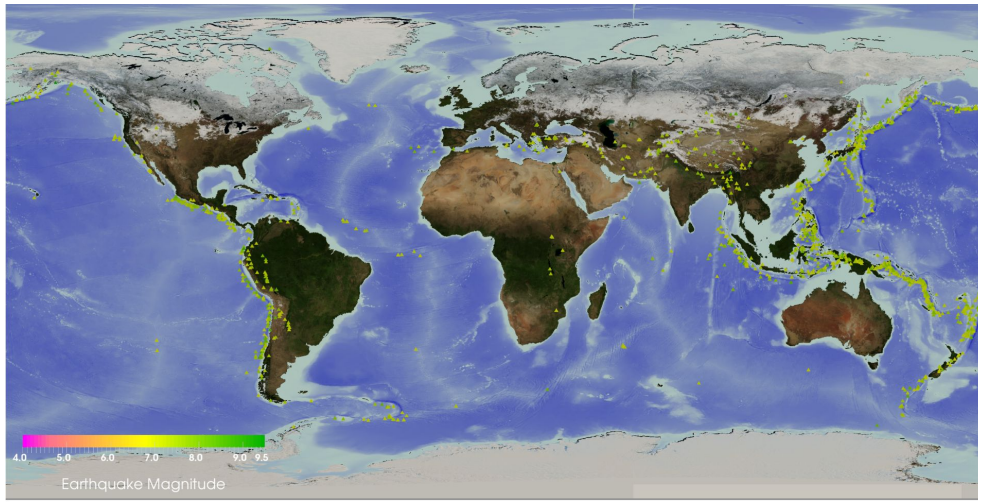
We set our project target audience as primarily students and people interested in geology education and historical data but might be novices in the field.

Related Works



USGS Recent Earthquake Visualizer

- Gold standard for Earthquake Visualization
- Lacks integrated information about deaths and damages as well as learning section



Princeton Historical Earthquake Visualization

- Historical data
- Lacks interactivity, and information other than magnitude

Motivation

- In current literature, the different facets of the earthquake knowledge are **dispersed** and users need to search through different sources to obtain said knowledge.

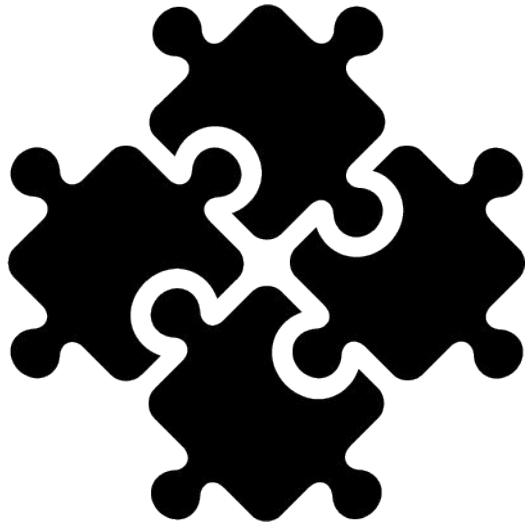
- The '**impact**' of an earthquake is much deeper than simply magnitude.

- Users need a way to understand not just the geology of an earthquake; but also its **social costs** (human life, property damage ..etc)

- We want to integrate a wealth of data going back to 1800 so users can **draw historical conclusions** and find patterns

Our System

Provide visual context to numerical data



Integrate pieces of information together to show the big picture

visual by Adrien Coquet from the Noun Project

integration by Gregor Cresnar from the Noun Project

Visualization Breakdown : Learn

Learn More About Earthquakes

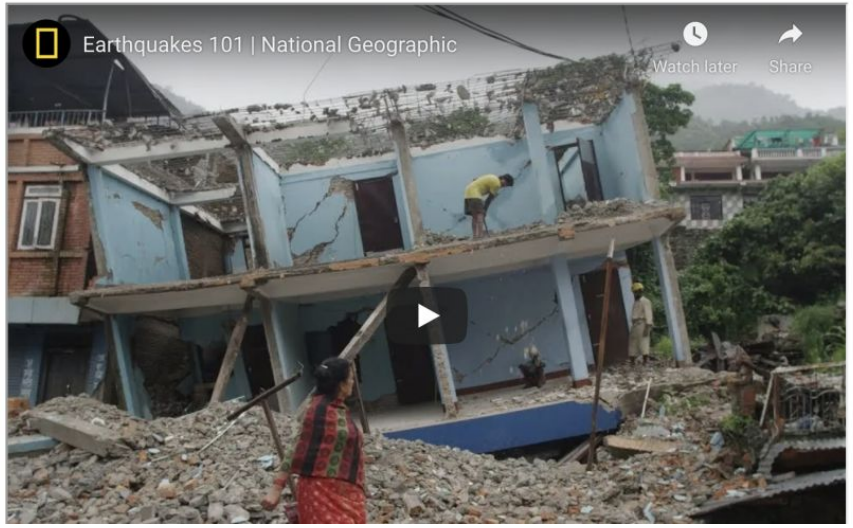
World Map

Earthquakes are a geological phenomenon caused by the shifting of Earth's crust. Find more information about Earthquakes on this page.

What are Earthquakes and why do they occur?

Rapid shaking of the earth is considered to be an earthquake. To understand why earthquakes occur, we need to understand what the Earth's crust is made up.

The Earth's crust is made up of tectonic plates as can be seen in the image. These plates move, and at their boundaries, they cause an earthquake.



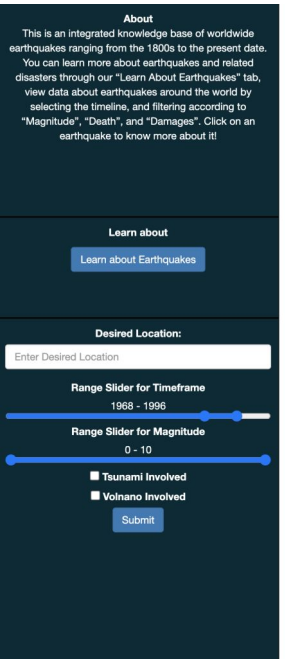
Effects of Earthquakes

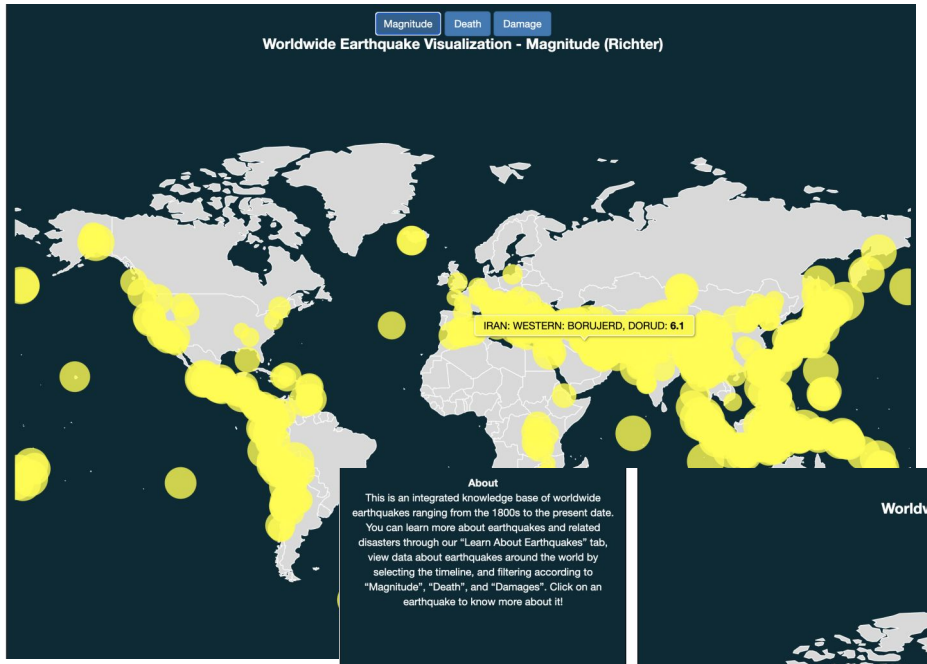
Earthquakes can result in ground shaking, ground rupture, landslides, tsunamis, and fires.

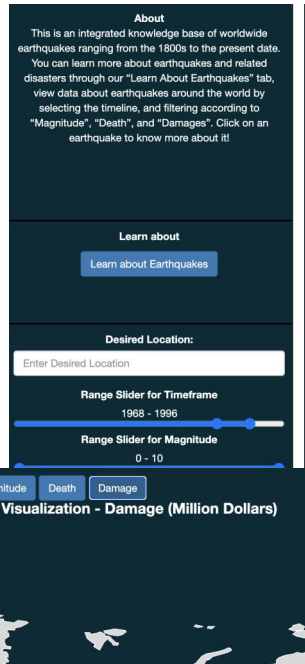
What are Tsunamis?

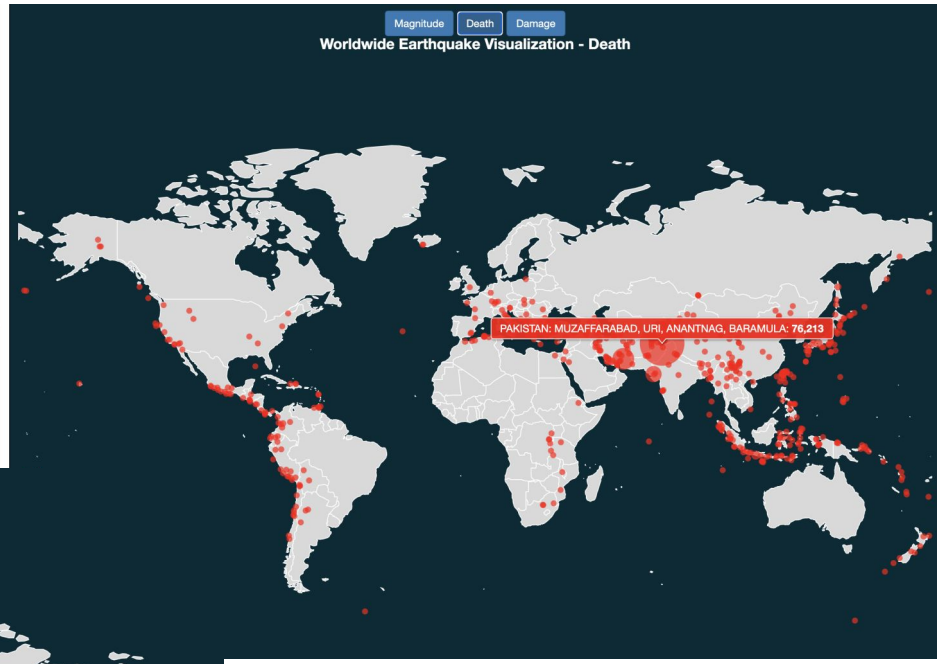
Tsunamis are giant waves caused by earthquakes or volcanic activities in the ocean. Let's learn more about them!

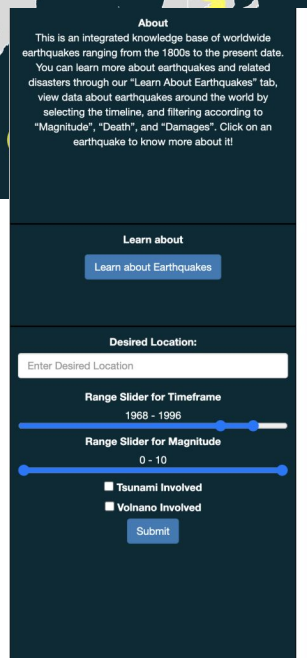
Specific Views and Color Scheme

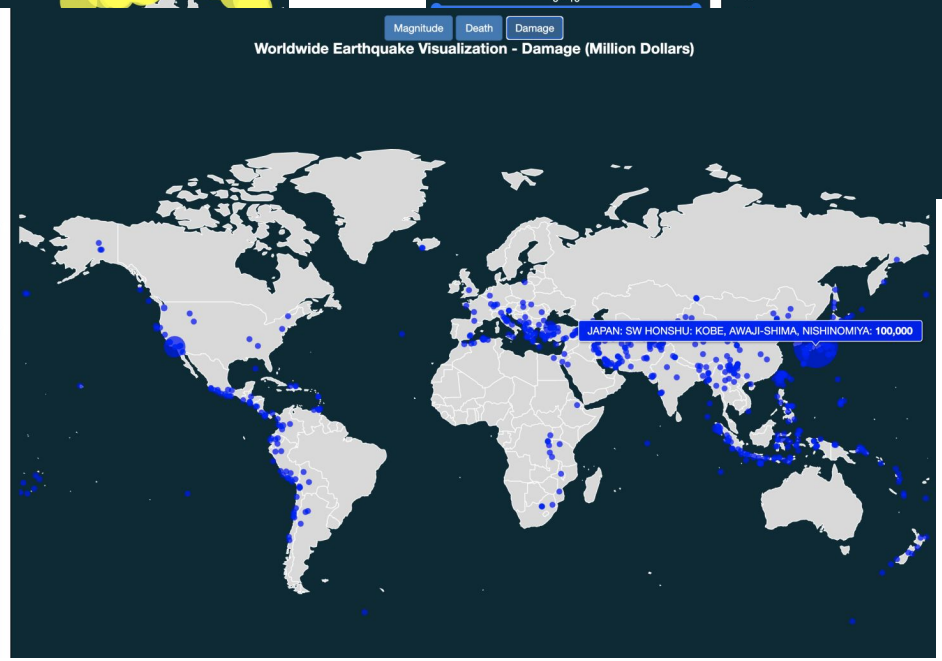








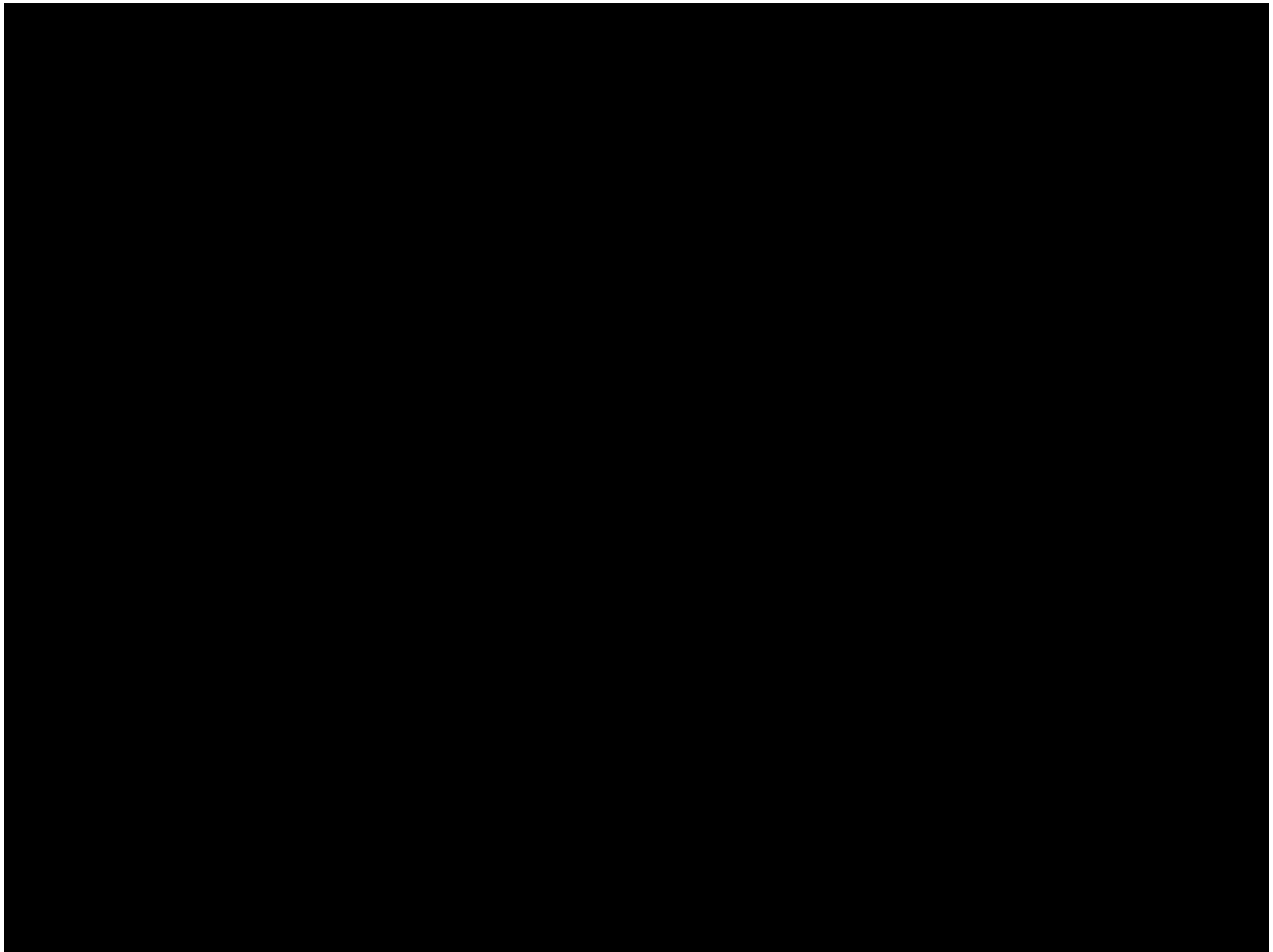




Related Articles

video link:
https://drive.google.com/file/d/1_vFeG0vQ7avewK2X7UJ3phcP0cCsti6B/view?usp=sharing

Demo



Limitations and Future Work

- Summary of only Wikipedia Articles → Add Other sources, Links
- Usability Testing → Evaluation Plan
- Potential for Cluttered View → Threshold Implementation

Evaluation Plan

- **Behavioral effectiveness:**

  How easily users can navigate the different map views and features (e.g., sliders, time filters) ?

- **Learning effectiveness:**

  The learning ability of participants in understanding world map visualization and summarization of related articles for the specific earthquake

  Overall experience in using our system in terms of cognitive load and learning new interactive features.

Evaluation Plan

- Target group of the project
  - Novice students, people who have interest in earthquakes (at least 16 participants)

- Within-subject study
  - **Baseline:** let participants use the common ways to do the tasks (e.g., google search, youtube video, etc.)
  - **Experimental:** use our system to do the tasks
  - **Balancing the order:** half of participants use the baseline method first, and the other half use our system first (balanced order to remove learning effect)

- Data collection
  - **Quantitative analysis :** NASA TLX / Likert scale questionnaire
  - **Qualitative analysis :** Observation, Informal interview

Technologies Used

HUGGING FACE

Questions?