

AUGMENTING OUR PLANET

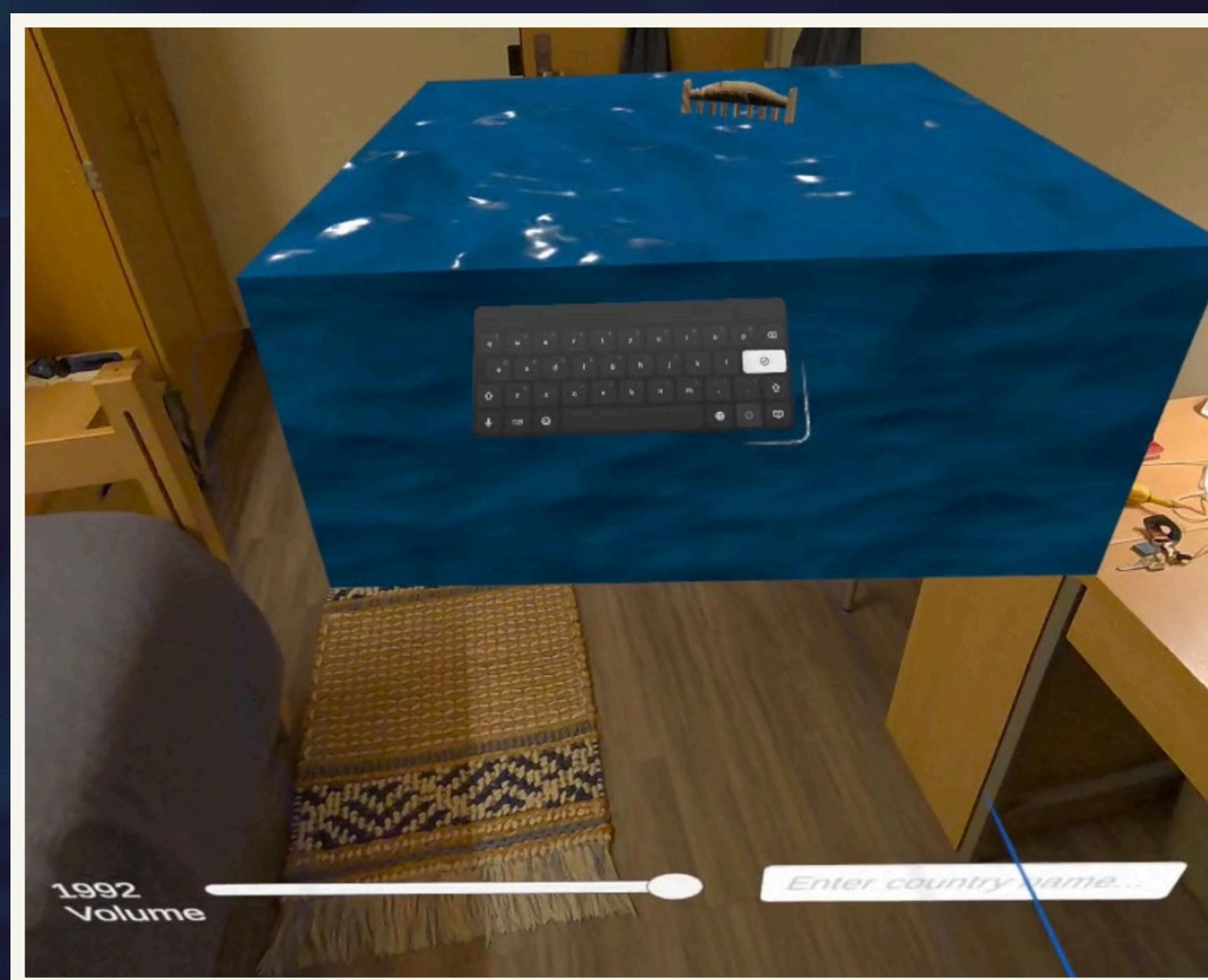
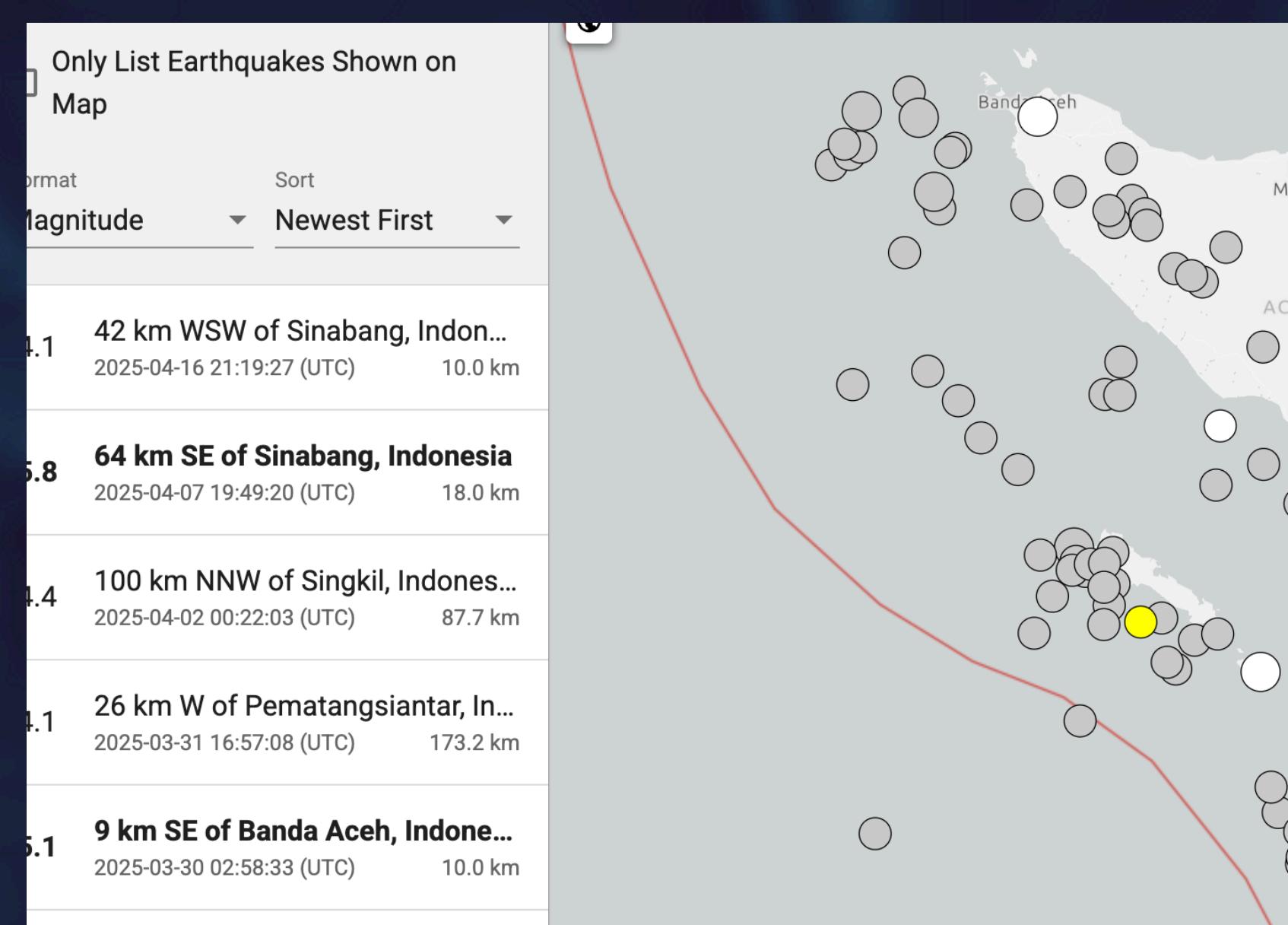
IMMERSIVE EARTH DATA IN AR

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Introduction

This semester, I focused on using augmented reality to bring environmental data to life. Through two projects, one visualizing **renewable freshwater availability across countries**, and another **mapping earthquake activity in the Sumatra** region, I explored how AR can make complex geospatial patterns more tangible, interactive, and intuitive. By combining real-world datasets with immersive visual and haptic elements, these experiences aim to deepen understanding of global resources and natural phenomena.

Visualizations



Existing 2D Data

AR Data Viz.

Earthquake Visualization

Uses AR to **render seismic data and earthquake activity** (in Sumatra, 2000–2025) in 3D space. Earthquakes are displayed as **interactive spheres** whose size, depth, and placement correspond to magnitude and coordinates. **Haptic feedback** lets users feel and compare the seismic intensity of different events. **Button toggles** allow for additional overlays of tectonic plate boundary data, depth error data, map view changes, and terrain exaggeration.

Water Visualization

Uses AR + passthrough **for lifesize representation of volumetric data**. Users can explore how water availability varies globally by viewing country-level data represented as **rising or falling water levels**. A time slider allows comparison of changes over time, highlighting regional disparities.

Findings

Project 1

- AR improved **user engagement** and **data comprehension** compared to 2D.
- Users found that volumetric AR displays made trends in water levels **more visually intuitive and relatable**, but **less numerically memorable**.
- Users found **cross-country comparison** easier on **2D charts**, but **single country immersion** easier on the **AR app**.

Project 2:

- AR helped users **better perceive depth, magnitude, and spatial distribution** of seismic events.
- **Increased choice** was viewed **positively**. Users noted that it **helped them remember** specific data, and encouraged them to **explore more deeply**.
- More user choice + display options caused **confusion** and was **overwhelming** for some.

Haptics Process

