METEOR MADNESS

NASA SPACE APPS

TEAM MŁYN

A METEOR IS COMING. DO YOU KNOW WHERE TO TAKE SHELTER AND HOW TO EVACUATE?

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WHAT TO DO IN THE EVENT OF A METEOR IMPACT

The threat of a meteor impact is rare, but its consequences can be catastrophic. In a sudden emergency, there is no tool that can inform people in real time about the level of risk, potential effects, and the nearest safe locations. The lack of quick access to such information can lead to chaos, panic, and inefficient evacuation.

WHEN A METEOR FALLS, EVERY SECOND MATTERS.

- CHELYABINSK (2013): A METEOR 20 METERS IN DIAMETER INJURED OVER 1,500 PEOPLE WITH ITS SHOCKWAVE ALONE.
- NASA ESTIMATES THAT THOUSANDS OF OBJECTS WITH UNKNOWN TRAJECTORIES ORBIT THE EARTH AND COULD ENTER THE ATMOSPHERE

THE LACK OF AN EVACUATION SYSTEM FOR CIVILIANS MEANS THAT MOST PEOPLE DON'T KNOW HOW TO REACT IN THE EVENT OF SUCH AN INCIDENT.

IMPACT ZONE - YOUR SHIELD OF SAFETY

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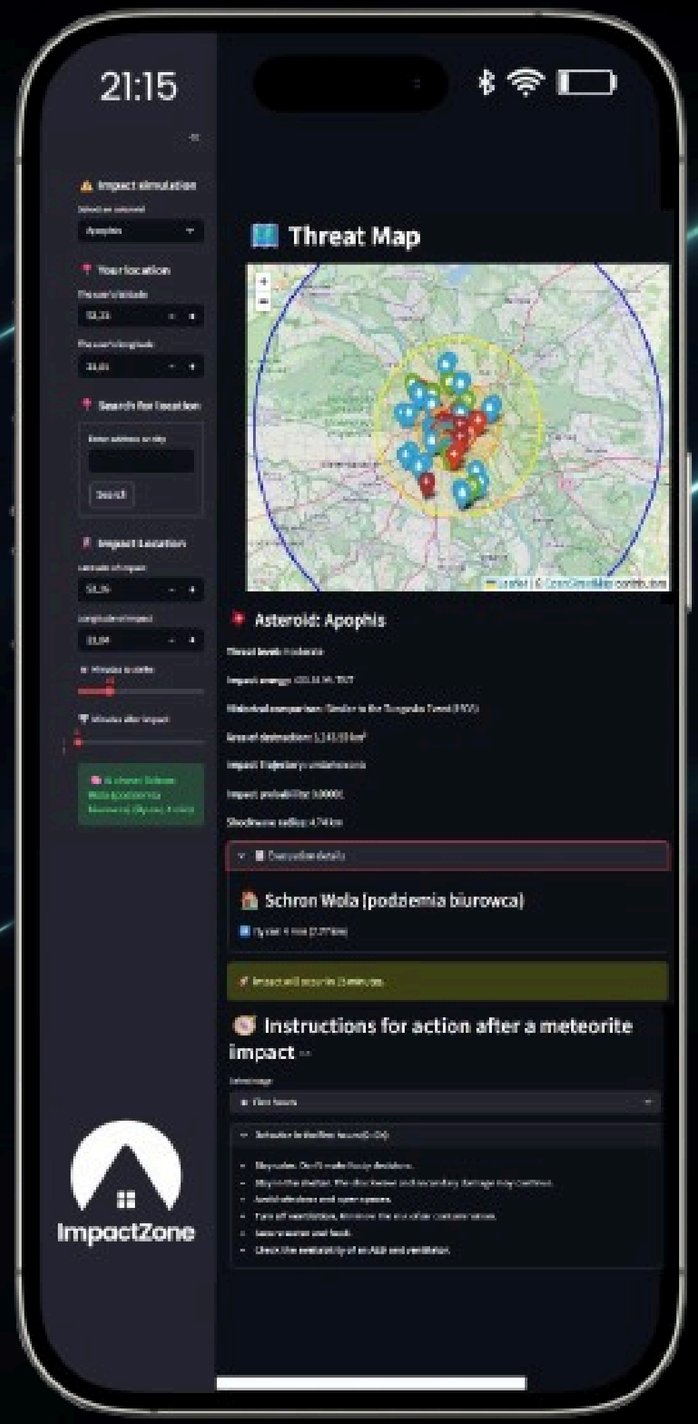
In the moment when the sky flashes and the world turns into chaos, people need clear information, **where** and **how to escape.**

Impact Zone analyzes asteroid data in real time, identifies the danger zone, and shows you the **safest evacuation route.**

The app tells you where to take **shelter**, how far to move, and what the potential impact effects might be.

IT'S NOT JUST A WARNING SYSTEM, IT'S A SURVIVAL TOOL THAT CAN SAVE YOUR LIFE AND THE LIVES OF YOUR LOVED ONES.



FROM THEORY TO ACTION

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ImpactZone is based on reliable sources and precise calculations:

- **NASA Near Earth Object API** – provides up-to-date data on asteroids,
- **Google Maps API** – delivers accurate locations and evacuation routes,
- **Impact range model** – takes into account kinetic energy, speed, and entry angle of the meteor,
- **Population and density analysis** – forecasts the social impact of an event.
- The project was built using **Streamlit, Pandas, Datetime, and Folium,** enabling real-time data processing, trajectory calculations, and visualization of danger zones.

WE COMBINE DATA PRECISION WITH THE SIMPLICITY OF A MAP THAT ANYONE CAN UNDERSTAND IN A CRITICAL MOMENT.

FROM DATA TO SAFETY

THE NUMBER OF DETECTED ASTEROIDS **HAS INCREASED 220-FOLD** SINCE 1990. THE MORE OBJECTS WE DISCOVER, THE GREATER THE RISKS WE CAN IDENTIFY. **IMPACT ZONE** TRANSFORMS THIS DATA INTO CONCRETE ACTION – WARNING COMMUNITIES AND SAVING LIVES.

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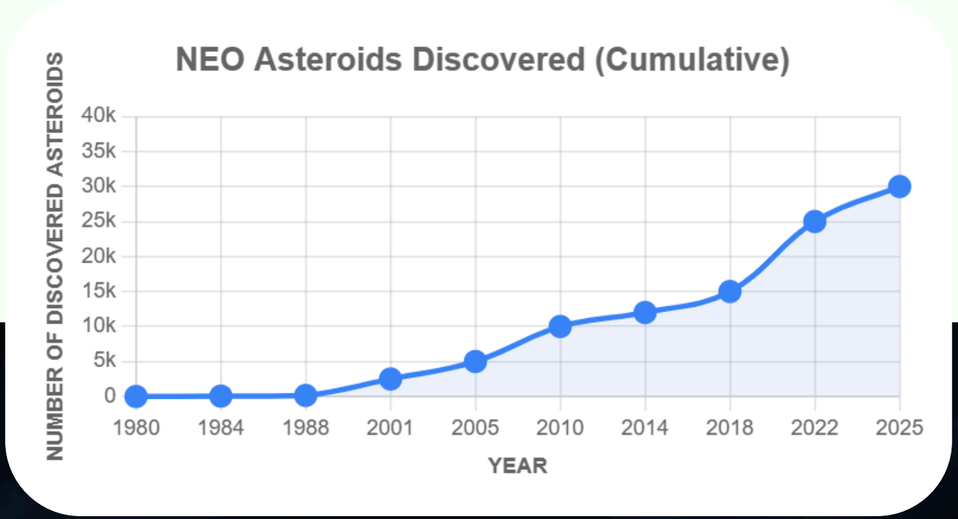
PROTECTING VALUES

Through **early warnings** and intelligent evacuation planning:

- We reduce the number of casualties; the system indicates **safe locations** and **escape routes** in real time,



EDUCATIONAL IMPACT

- We build **social resilience;** awareness of cosmic threats helps communities respond better to other crises as well.
- We **minimize panic;** people receive clear instructions on what to do instead of acting chaotically.

NOT JUST WARNING - WE'RE HELPING YOU SURVIVE

Unique goals and features of Impact Zone:

- **shows the nearest shelters;** the user immediately sees the safest point in their area,
- **calculates the route to the shelter;** based on **Google Maps API** and real-time traffic data, it indicates **the fastest** and **safest evacuation path**,
- **displays key locations nearby;** hospitals, medical aid points, and water and food distribution centers,
- **real-time simulation;** the user can view the predicted impact range and effects in different scenarios.

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OTHER SYSTEMS FOCUS SOLELY ON DATA - IMPACTZONE FOCUSES ON PEOPLE.

OTHER PROJECTS ONLY WARN ABOUT THE DANGER - WE IMMEDIATELY PROVIDE THE SOLUTION.

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OUR MISSION - FUTURE

EXTENDING THE APPLICATION WITH NATURAL DISASTER ALERTS: EARTHQUAKES, FLOODS, FIRES

ADDING A RADIATION ANALYSIS MODULE AFTER A RADIOACTIVE ASTEROID IMPACT.

IMPLEMENTATION OF A WAR WARNING SYSTEM, PREDICTING STRIKE ZONES AND SUGGESTING EVACUATION ROUTES.

INTEGRATING IMPACTZONE WITH EVERYDAY APPLICATIONS, SUCH AS MOBYWATEL.

SCALING THE PROJECT TO A GLOBAL LIFE PROTECTION SYSTEM RESPONDING TO EVERY THREAT, FROM SPACE AND FROM EARTH.