

GeoAI.js

Bringing Earth Observation AI to the Browser with WebGPU

What is GeoAI.js?



Supported Tasks already include

**Object Detection
Classification
Segmentation and
Advanced Tasks**

Object Detection

- Car Detection
- Ship Detection
- Building Detection
- Oil Storage Tank Detection
- Solar Panel Detection

Classification

- Land Cover Classification

Segmentation

- Image Segmentation
- Wetland Segmentation
- Building Footprint Segmentation
- Mask Generation

Advanced Tasks

- Zero-shot Object Detection
- Oriented Object Detection
- Image Feature Extraction

The Problem

- Most GeoAI solutions require complex cloud infrastructure
- Python environments create barriers for web developers
- Web integration of geospatial AI remains challenging
- Huge community of JavaScript Developers left behind

The Solution

Build on existing standards & familiar tools

- Just Extend existing frontend libraries with AI capabilities like leaflet, deck.gl or maplibre.
- Add tasks specific for Geospatial AI (e.g. object detection, land cover classification, etc.)
- Add support for different imagery providers (e.g. ESRI, Mapbox, Google Maps)

Live Demo

<https://docs.geobase.app/geoai-live>

How Does It Work?

1. Model Conversion for GeoAI.js / Transformers.js

- **Convert to ONNX format:**

Supported Frameworks:

TensorFlow, PyTorch, JAX

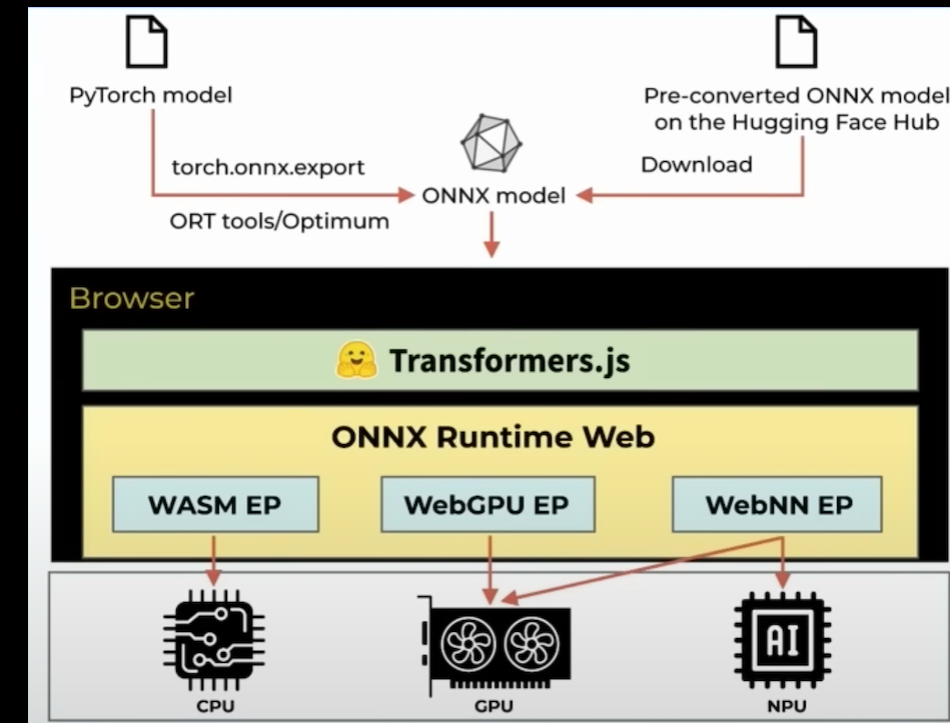
- **Quantization Scripts:**

[huggingface/](https://huggingface.com)

transformers.js/scripts

- **Host Models:** [https://](https://huggingface.co/geobase)

huggingface.co/geobase



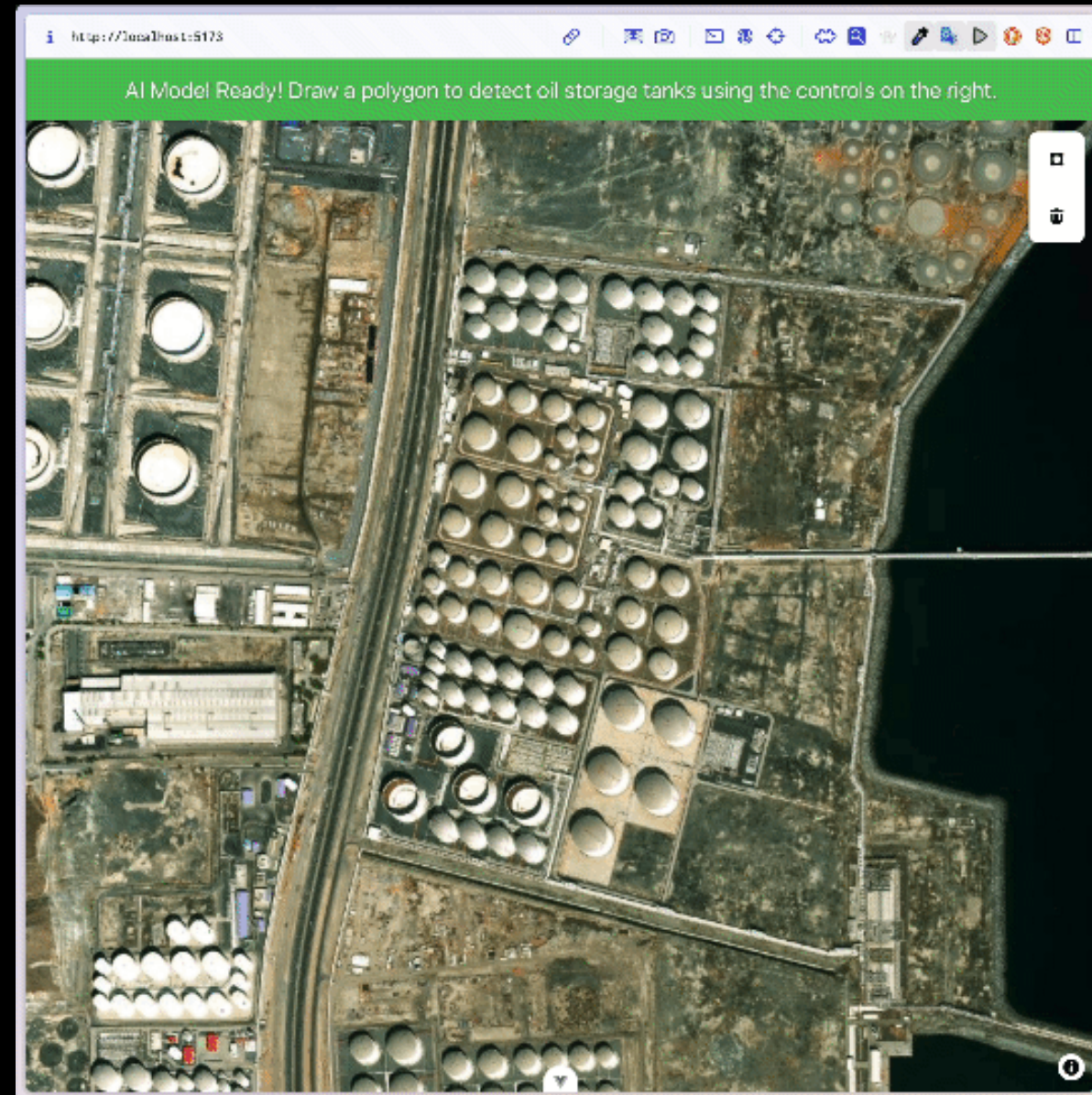
2. Write javascript code to run the models on the imagery

```
import { geoai } from "geoai";

const pipeline = await geoai.pipeline([ { task: "object-detection" } ], {
  provider: "esa",
});

const result = await pipeline.inference({
  inputs: { polygon: yourPolygon },
  postProcessingParams: { confidence: 0.8 },
  mapSourceParams: { zoomLevel: 18 },
});
```

3. Display the results on a map



Key Benefits

- **No Cloud Infrastructure** - Run AI locally in the browser
- **Real-time Analysis** - Instant results without API calls
- **Cost Effective** - No per-request pricing
- **Privacy First** - Data stays in the browser
- **Easy Integration** - Works with any mapping provider

Getting Started

```
npm install geoai
```

Thank You!

Questions?

- **GitHub:** <https://github.com/geobase/geoai.js>
- **Documentation:** <https://docs.geobase.app/geoai>
- **Live Playground:** <https://docs.geobase.app/geoai-live>
- **Models:** <https://huggingface.co/geobase/models>
- **Email:** shoaib@decision-labs.com