bpx Spatial Master

Company background

bpx energy — bp's US onshore oil and gas business — is headquartered in Denver and, from there, manages world-class assets that span Texas and Louisiana. bpx is making a significant step for the company's aims to reduce emissions and enhance production while improving reliability of bpx's assets. bpx has a large scale development program that is focused on drilling, completing, and producing wells efficiently and in an environmentally conscious way.

Project Description

The goal of this project is to integrate Geospatial Artificial Intelligence (GeoAI) and ArcGIS technology to create a maintainable spatial master of all BPX equipment and facility locations. This involves enabling field personnel with a process to tie the locations to an equipment ID that links back to a source system. Initial and continued mapping of data locations will benefit from a machine learning algorithm that detects features on a map and places points, which can be enhanced using crowd-sourced data or other AI methods. These points will then be consumed by a field application for assigning the mapped point to the correct equipment ID while also ensuring an easy process for routine updates to the data.

Key Objectives:

GeoAI Methodology:

- Apply GeoAI techniques to identify and map facility and equipment location features from various sources such as aerial imagery, drone imagery, Ortho mosaics, crowd-sourced data, or other AI methods.

Field Data Collection App:

- Develop an asset web map that tracks spatial master tie progress. This map service will also be integrated into the field application to aid field personnel in identifying and updating unmapped points.
- Create a field data collection application using ArcGIS tools (e.g., Survey123 and Field Maps) to enable field personnel to tie mapped features back to unique equipment and facilities IDs.

Visualization & Updates:

- Develop a dashboard with relevant data on the GeoAI-detected features to supplement analysis for asset management and provide a comprehensive view of assets.

- Propose a protocol for ongoing data maintenance, ensuring the information remains current and accurate.

Desired Skillset

- SQL SDE
- ArcGIS Pro - GeoAI toolbox & Spatial Analyst Deep Learning tools
- ArcGIS Survey123 & Field Maps
- ArcGIS Experience Builder
- Python
- FME Desktop (Flow) - not required but a plus
- AI / ML / Spatial data science practices

Preferred Team Size

We expect this work to be more suited to a team of 3 students, maximum of 5.

Internship Possibilities

Upon completion of the field session, bpx is open to discuss internship opportunities.

Location

Students will work at CSM campus or their agreed location and meet with their BPX contact on a bi-weekly basis in person or via teleconferencing.

Resources

bpx can provide AWS cloud resources, ArcGIS licensing, and data access in support of the project.

Contact

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