

MICHIGAN STATE

UNIVERSITY

Alpha Presentation

Live Platform CAD Ingestion

The Capstone Experience

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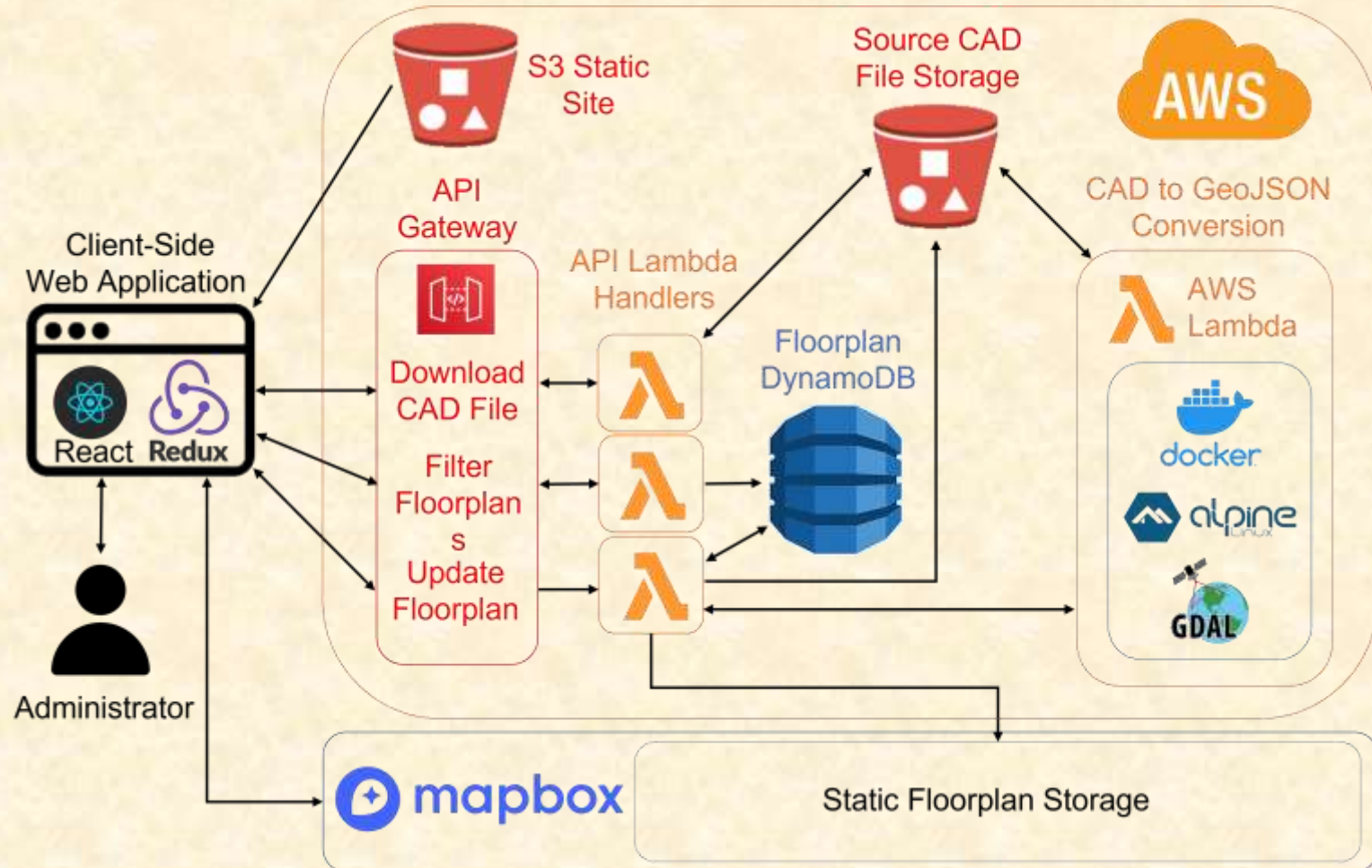
*From Students...
...to Professionals*

Project Overview

- Herman Miller is a globally recognized provider of furnishings and related services and technologies
- Live Platform allows users to visualize and analyze their workspaces
- Implement ability to ingest CAD files into mapping system instead of images
- Create a standalone web application to allow administrators to view and modify floorplans



System Architecture



Navigator Page

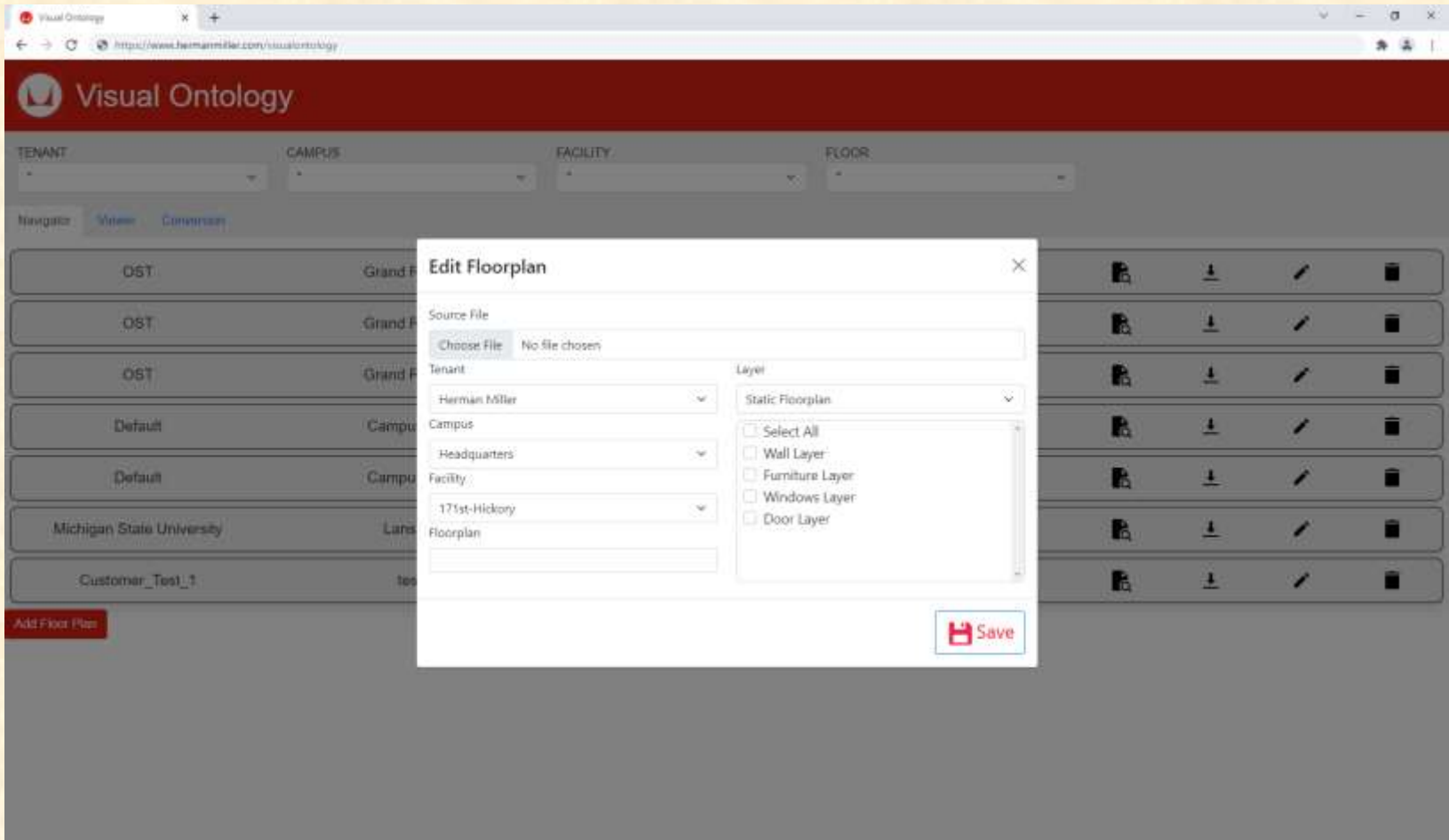
The screenshot displays the Visual Ontology web application interface. At the top, there is a red header with the 'Visual Ontology' logo and name. Below the header, there are four dropdown menus for filtering: TENANT, CAMPUS, FACILITY, and FLOOR. The main content area is titled 'Navigator' and contains a table with columns for TENANT, CAMPUS, FACILITY, and FLOOR. The table has eight rows, with the third row highlighted in red. Below the table is a red button labeled 'Add Floor Plan'.

TENANT	CAMPUS	FACILITY	FLOOR				
OST	Grand Rapids	Facility 001	Engineering				
OST	Grand Rapids	Clock Tower	Engineering				
OST	Grand Rapids	Clock Tower	Floor 2				
Default	Campus 001	Facility 001	First				
Default	Campus 001	Facility 001	Second				
Michigan State University	Lansing	Engineering Building	First Floor				
Customer_Test_1	test	pacific	test				

[Add Floor Plan](#)



Navigator Page Edit Window



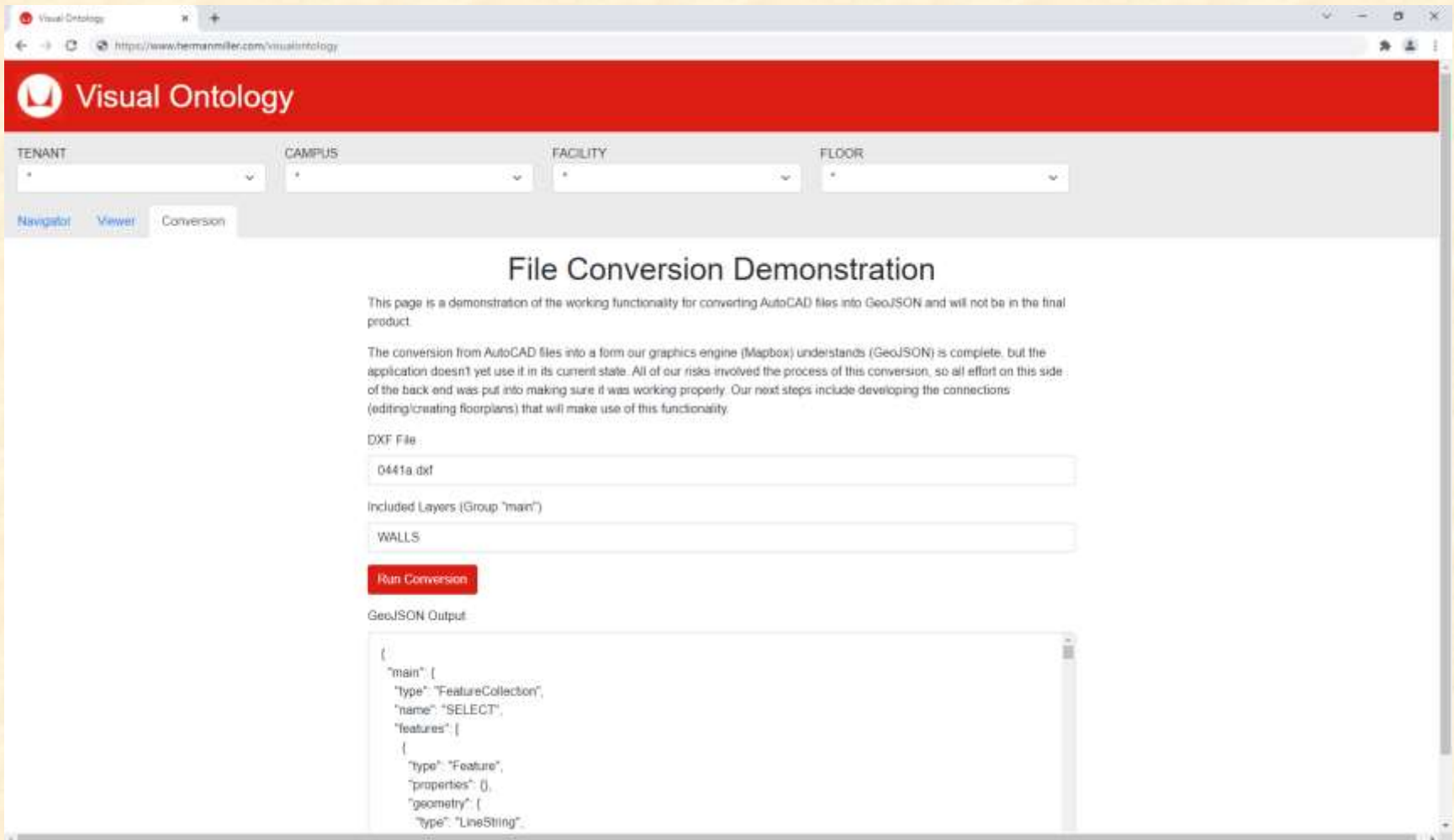
Viewer Page

The screenshot displays the Visual Ontology web application interface. At the top, a red header contains the logo and the text "Visual Ontology". Below this, a navigation bar features four dropdown menus: "TENANT" (set to "Herman Miller"), "CAMPUS" (set to "Headquarters"), "FACILITY" (set to "Design Yard"), and "FLOOR" (set to "Main Facility"). Below the navigation bar are three tabs: "Navigator", "Viewer", and "Conversion", with "Viewer" being the active tab.

The main content area is divided into several sections:

- Left Sidebar:** A vertical list of labels including "LABELS", "ZONES", "GATEWAYS", "DURABLES", "BUS", and "CONNECTIVITY". Below this list is a search bar with the text "Find Search for Component" and a small icon.
- Central Area:** A collection of architectural floor plans and diagrams. One prominent plan is labeled "Workstation West" and shows a grid of workstations with various components highlighted in blue. Other plans show different views of the facility, including a large curved structure and various workstation layouts.

Conversion Page



The screenshot shows a web browser window with the URL <https://www.hermanmiller.com/visualontology>. The page features a red header with the Visual Ontology logo. Below the header, there are four dropdown menus for 'TENANT', 'CAMPUS', 'FACILITY', and 'FLOOR'. A navigation bar includes 'Navigator', 'Viewer', and 'Conversion' tabs. The main content area is titled 'File Conversion Demonstration' and contains the following text:

This page is a demonstration of the working functionality for converting AutoCAD files into GeoJSON and will not be in the final product.

The conversion from AutoCAD files into a form our graphics engine (Mapbox) understands (GeoJSON) is complete, but the application doesn't yet use it in its current state. All of our risks involved the process of this conversion, so all effort on this side of the back end was put into making sure it was working properly. Our next steps include developing the connections (editing/creating floorplans) that will make use of this functionality.

DXF File:

Included Layers (Group "main"):

Run Conversion

GeoJSON Output:

```
{
  "main": {
    "type": "FeatureCollection",
    "name": "SELECT",
    "features": [
      {
        "type": "Feature",
        "properties": {},
        "geometry": {
          "type": "LineString"
        }
      }
    ]
  }
}
```



What's left to do?

- Add and edit individual floorplans through the navigator page
- Add and edit sensors, zones and gateways on a selected floorplan in the viewer page
- Download source CAD files from floorplans
- Implement algorithm to enforce sensor hardware constraints
- Add more advanced error and state handling



Questions?

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