AI PROJECTS

Object detection for CAD/BIM tools

About

The client developed a digital solution specifically designed for tradespeople on construction sites. The software streamlines every phase of a construction project — preparation, execution, and control — enhancing productivity and efficiency. By combining traditional craftsmanship with modern digital processes, they bring clarity and coordination to every construction project.

Challenge

The core challenge of the project was to parse, scan, and interpret data from profile documents, PDF files, and other formats, applying object detection techniques for CAD/BIM tools. The information was often scattered and unstructured across these documents, complicating data interpretation. Additionally, processing the files took too long, which further hindered efficiency.

INDUSTRY:
Construction

LOCATION:
Germany

TECHNOLOGIES:
Python, PyTorch, OpenCV, AWS, AWS Lambda, S3, TensorFlow

Project Overview

To provide comprehensive and accurate information about construction projects, Building Information Model (BIM) data is used by design engineers, contractors, and manufacturers. Our task was to develop an object detection system for the BIM tool and present the data outcomes in a user-friendly front-end interface.

Object Detection Algorithm

We selected a Region-based Convolutional Neural Network (R-CNN) model for object and image classification within the files. This model was customized to parse the data into a structured and accessible format.

AI Component from Scratch

Since not all elements in the files were marked as text inputs by users, our developers created an AI component to enhance parsing through advanced labeling techniques, ensuring all relevant elements were included.

Front-end Display

After parsing all required components and optimizing file processing speed, we developed a front-end interface designed to present the extracted data in a user-friendly manner.

Results

By implementing computer vision techniques, the client achieved high accuracy in object detection, significantly streamlining the work of design engineers, contractors, and manufacturers. Our team successfully delivered the automation software on time and within budget.