



Timspark

Point Cloud Segmentation and BIM Conversion



Description

INDUSTRY

ARCHITECTURE

ENGINEERING

CONSTRUCTION

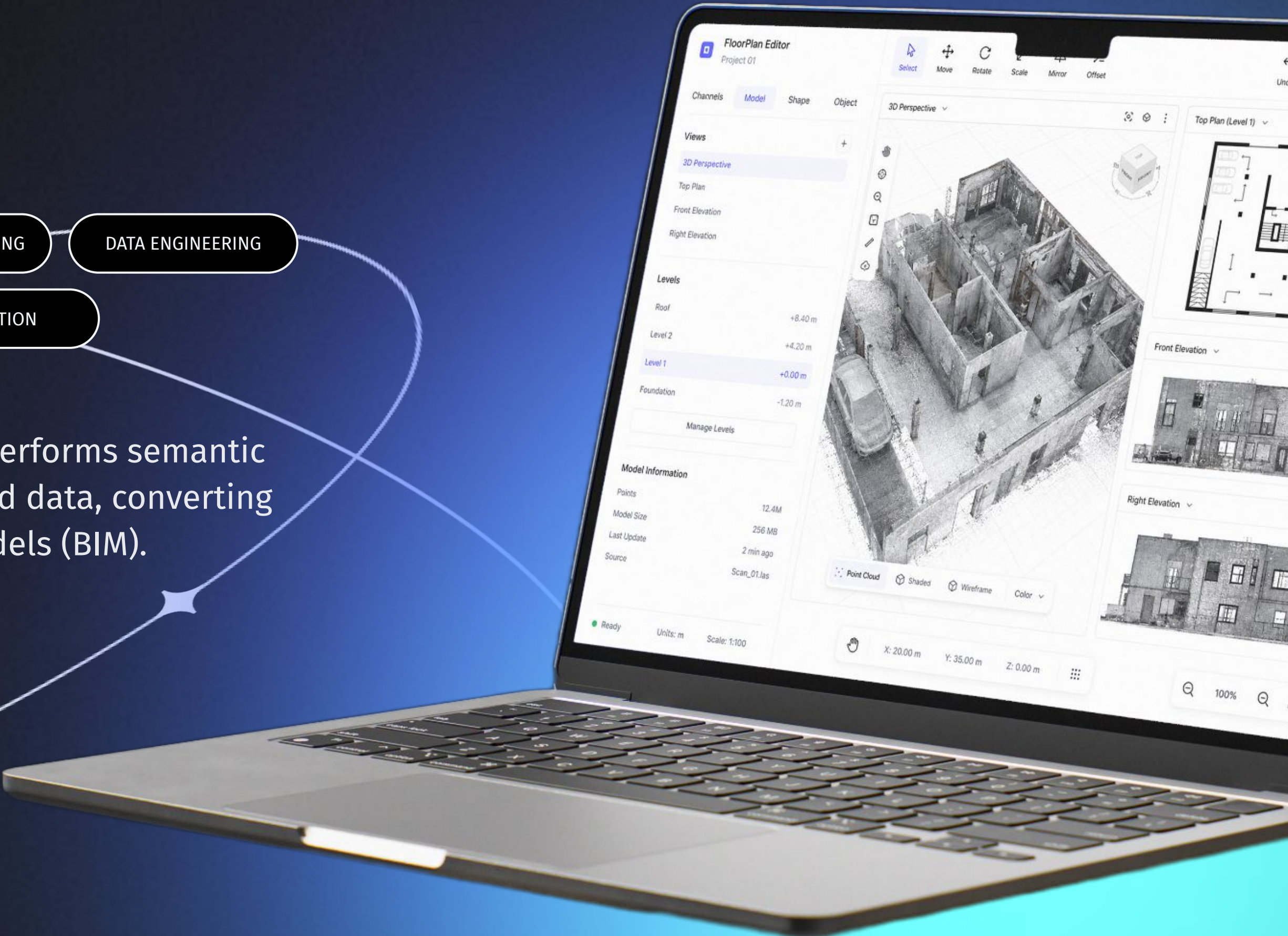
TYPE

AI & DEEP LEARNING

DATA ENGINEERING

BIM INTEGRATION

A deep learning-powered solution that performs semantic and instance segmentation of point cloud data, converting it into accurate Building Information Models (BIM).



* The image is illustrative. Project details cannot be disclosed due to the conditions of NDA between the Development Team and the Customer.

Technology stack

BACK-END



Python



TensorFlow



PyTorch

CLOUD PROVIDERS



AWS



Azure

TOOLS

Point Cloud Processing:
OpenCV, PCL

3D Deep Learning
Frameworks: Pointcept

3D Scanning: LiDAR
technology

BIM Integration:
AutoCAD, Revit, BIM 360

Depending on project requirements,
the output can also be delivered in
IFC file format for use across
different BIM platforms.

Challenge

Timspark engineers helped optimize the workflow between raw point cloud data and **BIM-ready deliverables**.

The goal was to automate point cloud segmentation and streamline conversion into Revit-compatible architectural models.

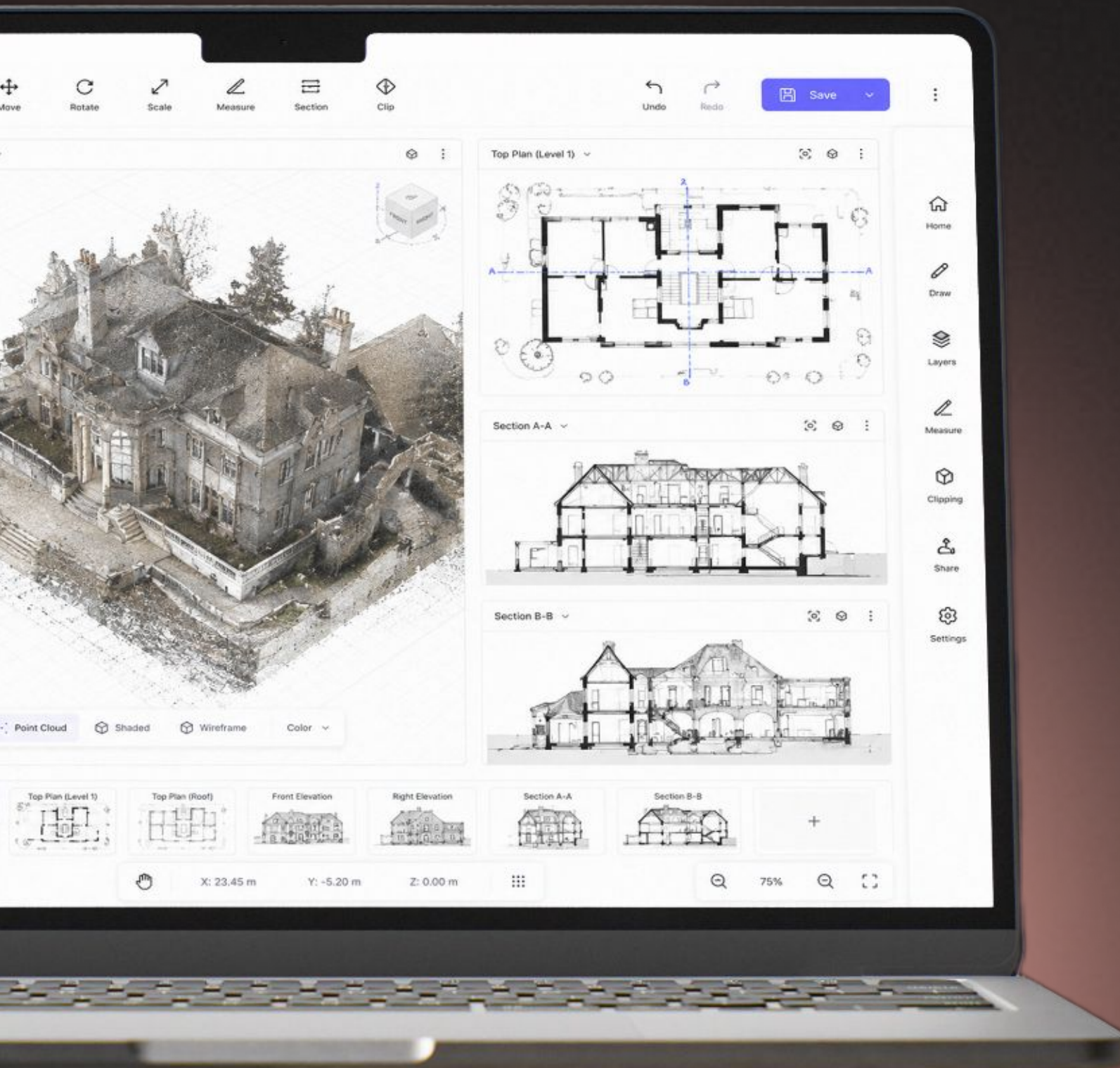
01

Data Identification – Accurately identifying building elements within large datasets while supporting project-specific classification.

02

ML Pipeline Implementation – Developing a supervised machine learning pipeline with chunk-based processing and validation.

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What we built



Custom AI-powered pipeline for 3D point cloud segmentation and classification



Built with Python, TensorFlow, PyTorch, PCL, Pointcept



Processes large-scale point cloud data in chunks with validation at each stage



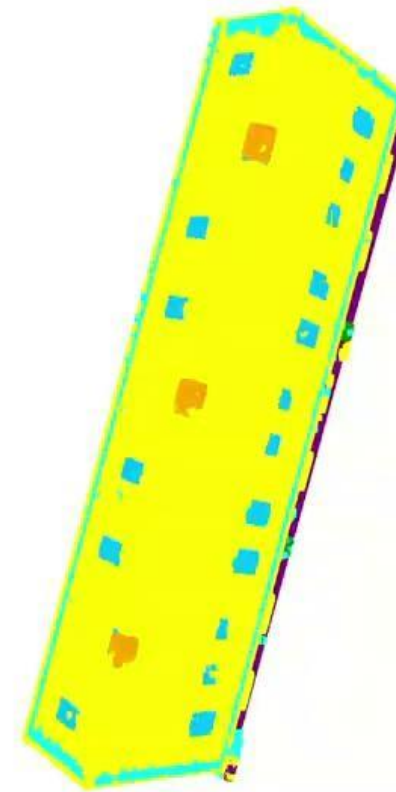
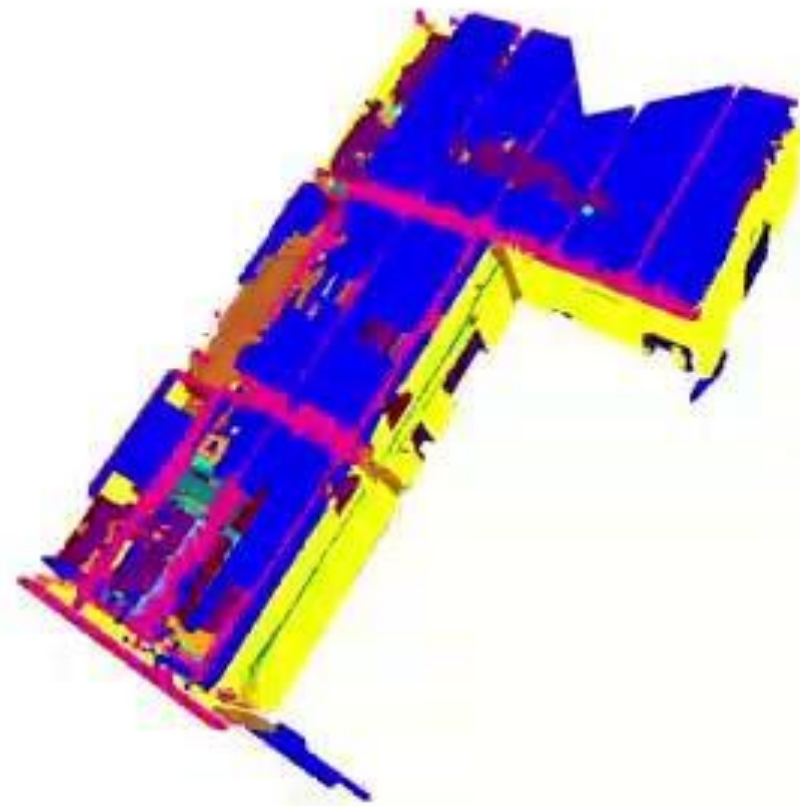
Converts processed data into BIM-ready structured output



Software-agnostic BIM output compatible with multiple CAD/BIM platforms

Segmentation output examples in GIF format

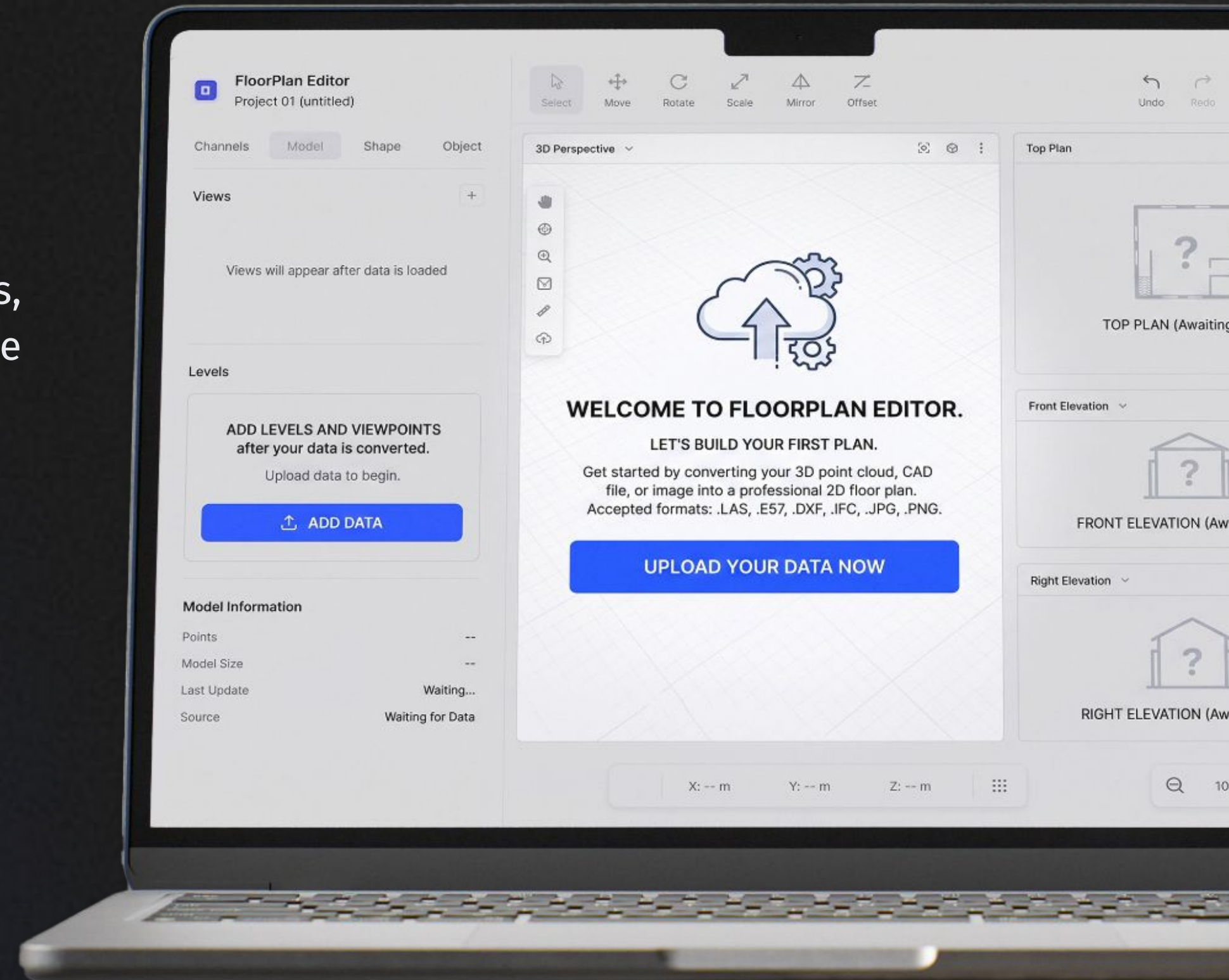
The GIFs show the output of the segmentation model for two different construction types: **residential building** and an **airport facility**. The set of detected classes differs depending on the building type and project requirements. In the full workflow, this segmentation stage is followed by validation and then conversion into BIM-ready outputs.



Why it matters

The solution improves **data processing efficiency** and enhances **infrastructure management capabilities**.

The workflow was tailored to project-specific requirements, including a customizable class taxonomy and an extensible architecture for more complex environments, with a focus on delivering production-ready BIM outputs rather than simple visualization.



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Core team



ALEXANDR MIGACHEV

Head of Delivery



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Marketing Lead

Results

The solution delivered significant improvements in accuracy and efficiency, enabling the client to automate point cloud segmentation and BIM conversion. This led to faster project turnaround times, reduced manual labor, and minimized errors in identifying and modeling building elements.

01

Faster project turnaround with automated segmentation & BIM conversion

02

Reduced manual labor and minimized errors in modeling

03

Seamless integration with industry-standard BIM tools (Revit, AutoCAD)

04

Cost savings & improved productivity for AEC workflows

Keen on exploring further?

Let's discuss your requirements and come up with a tailored solution!

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