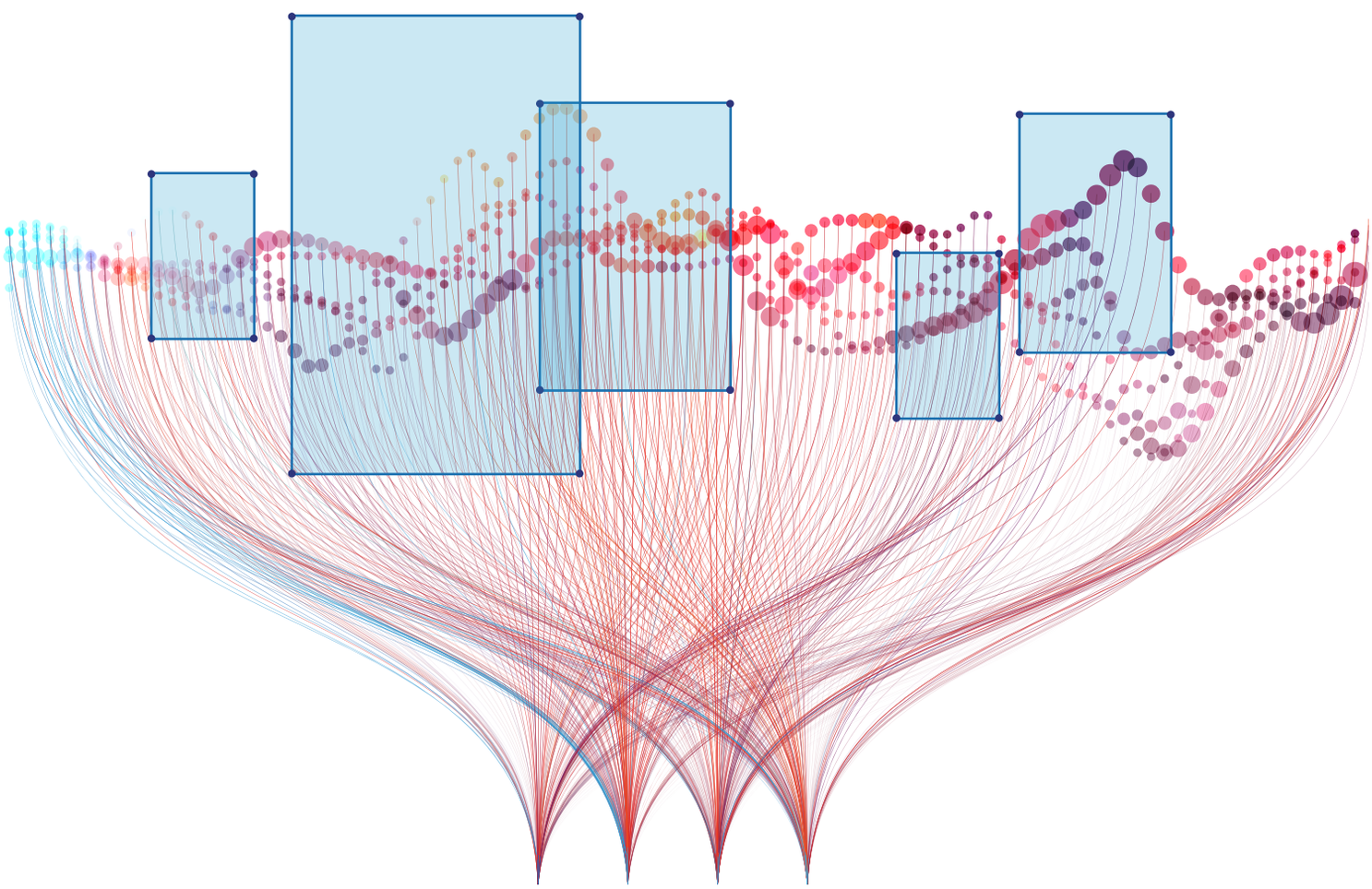
Hello Data
Auto

Create AI Training Data with HelloData

Autonomous driving data specialized solution
with high accuracy and diverse features



Hellodata AUTO

Offering fast speed, high accuracy, various features as
Autonomous Driving Solution

01. AI Annotation Data Labeling

- Fast performance with automatic annotation immediately upon dataset upload
- Guaranteed quality of data with high accuracy, swiftness, and convenience

02. Annotation of Various Objects

Various and advanced data annotation such as 2D, 3D, LiDar, Video annotation, and fisheye lens distortion removal

03. Supporting Various Attributions

Advancing AI performance by inputting and saving various characteristics such as direction, location, attributes, etc. of each object as attributes

04. Supporting Specialized Features of Autonomous Driving

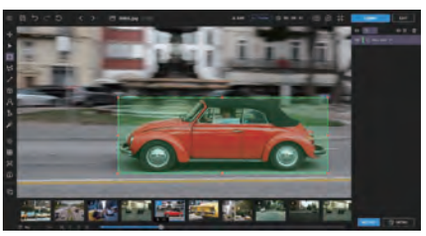
- Labeling information on the previous work can be copied
- Extraction of results through submission/rejection system

05. Systematic Project Management

- Fast performance with AI Annotation feature is offered as soon as the dataset is uploaded
- Guaranteed data quality with high accuracy as well as fast & convenient work environment
- Statistics on project progress provide a project manager to understand of worker throughput and schedules to project deadlines

AI Annotation

Vehicle Detection Using AI Annotation



Vehicle Detection using Bounding Box

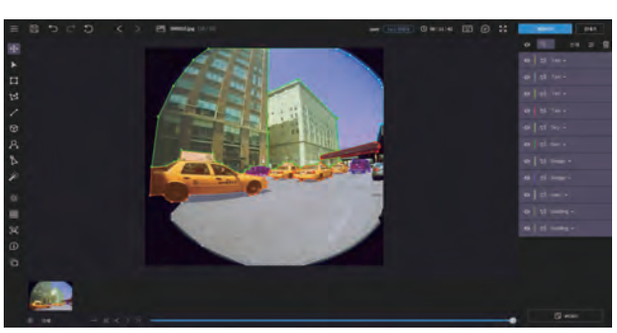
Lane Detection using Polyline

3D Lane Detection using Cuboid in LiDAR Data

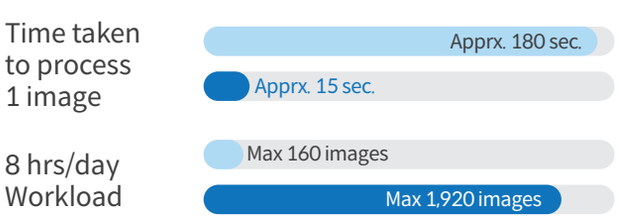
Vehicle Detection Accuracy	Vehicle Classification Accuracy	Inference Time Taken per Image
96.9 %	86.3 %	0.362 sec.
Detection accuracy for vehicles greater than 10px x 10px in size, of the 100 road images	Classification accuracy for vehicles greater than 10px x 10px in size and less than 0.5 occlusion, of the 100 road images	Average inference time of 100 driving images

Automatic Detection using AI Drawing Tool

Automatic segmentation tool which is combined **with Hellodata AUTO's unique AI technology** provides object-wide recognition with only one click.



- AI recognizes an object in the image and distinguishes the boundary so by clicking a part of an object to segment, the whole object is segmented
- Easy & faster completion of segmentation job within 3 clicks, instead of manual polygon tool usage which takes long working time
- Labeling/Recognition of any object without class limitation

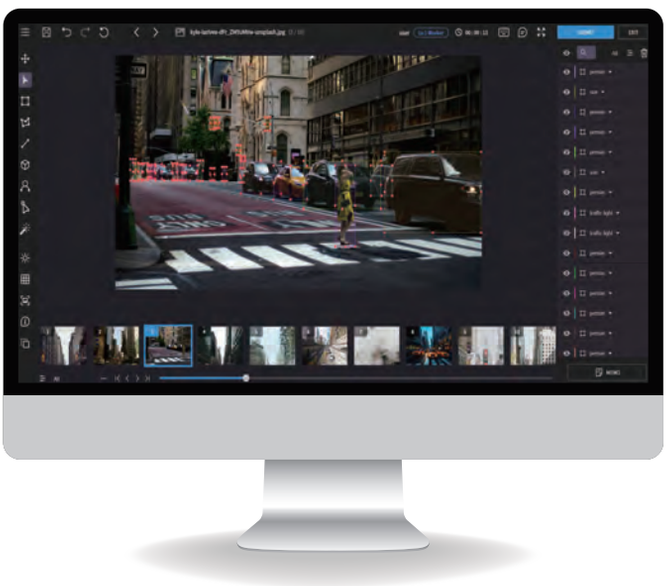


Time taken to process **1 million images** by **8 workers** **for 8 hours/ day**

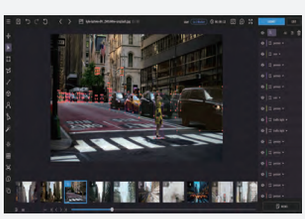
Manual Annotation AI Support

Annotation of Various Objects

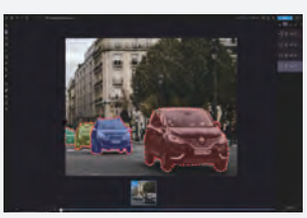
Various AI-based deep learning image detection enables various data annotation



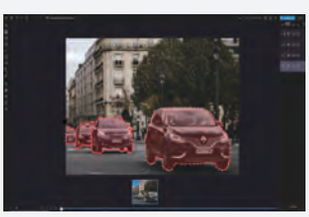
2D



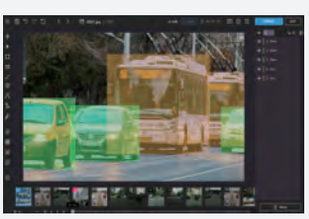
Object Detection



Object Segmentation



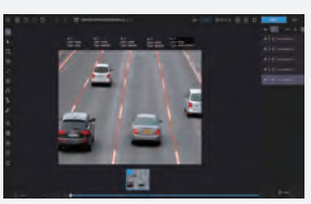
Object Classification



Vehicle Classification

Labeling

Pedestrian Detection

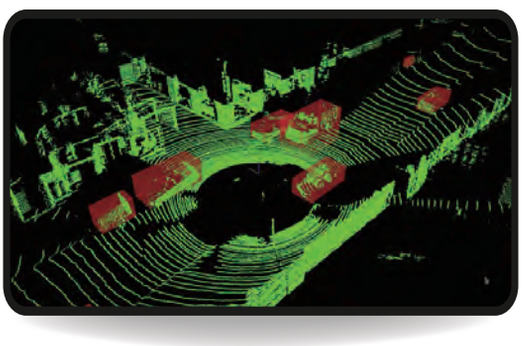


Lane Detection

Location Data

Annotation of Various Objects

Providing advanced data annotation such as LiDAR, 3D, etc



01. LiDAR

A process to detect objects on point cloud data which was acquired from LiDAR data in a 3D cuboid format

This task can process LiDAR data that requires spatial recognition

02. 2D ↔ 3D

By linking 3D point cloud information, cuboids are embodied on the image Comparing the cuboids and 2D images support convenient annotation tasks

03. Video

Supporting annotation of which vehicles or lanes on the video are continuously tracked without interruption

Annotation of Various Objects

Accurate annotation by removing distortion that occurs caused by fish-eye lens

Geometric Rectification

Raw Image

Fish-eye lens images and refracted images are commonly found among dash cam videos and black box images for vehicles

Rectified Image

The closer the object is, the more refractions or distortions occur so, more accurate annotation needs to be done

Inverse Transform

Data Annotation

Hellodata AUTO starts vehicle detection after smoothing distortions of the fish-eye lens by applying Geometric Rectification technique

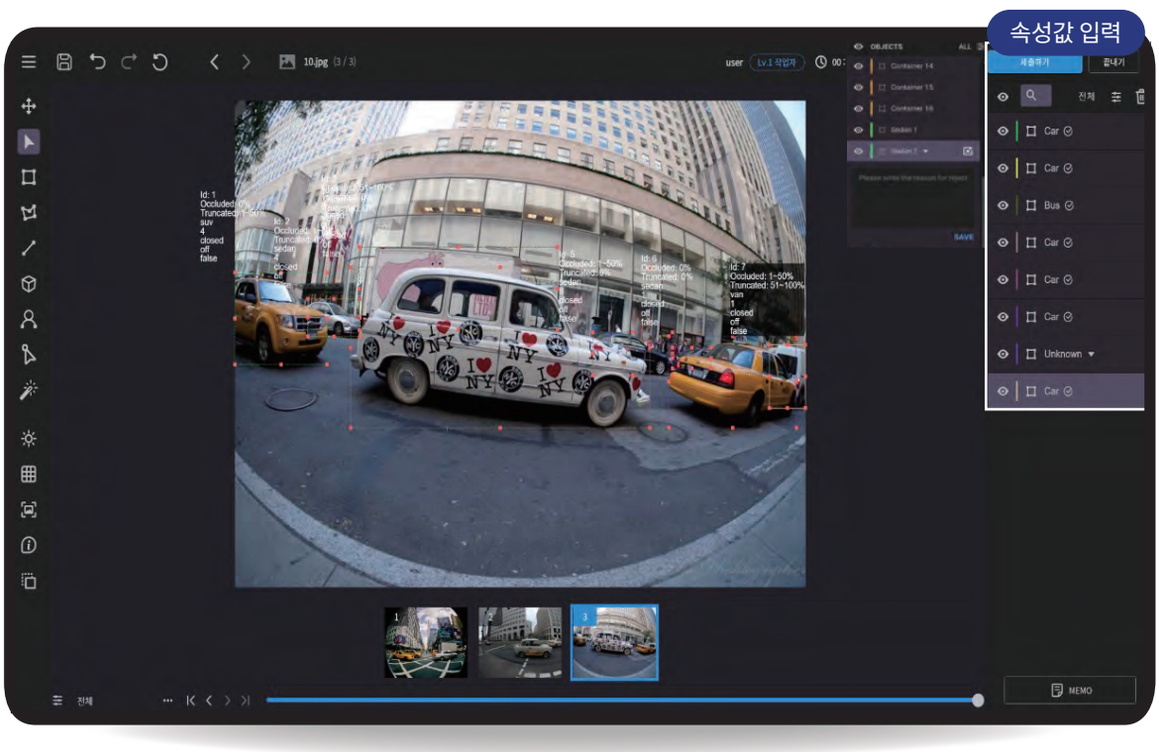
Result

By reflecting the results via reverse conversion of intrinsic matrix of rectification, accurate results that minimized the distortion are shown

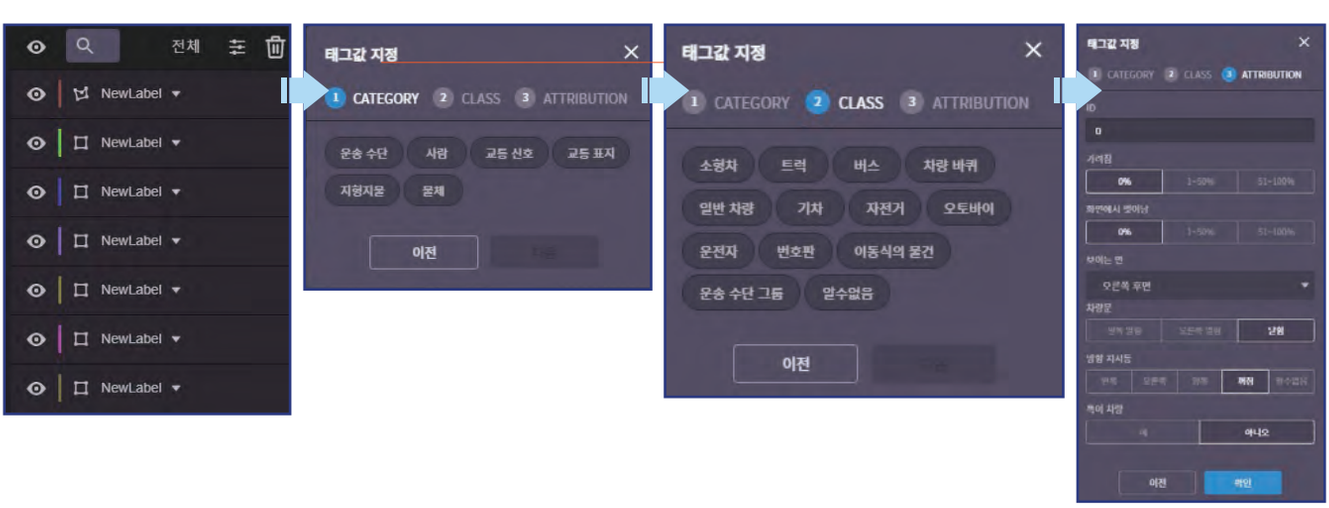
Supporting Various Attributions

Improving the performance of training dataset by processing the features such as direction, location, and attributions of the objects

(Ex) The directions of the car wheels, car doors, number plates, etc



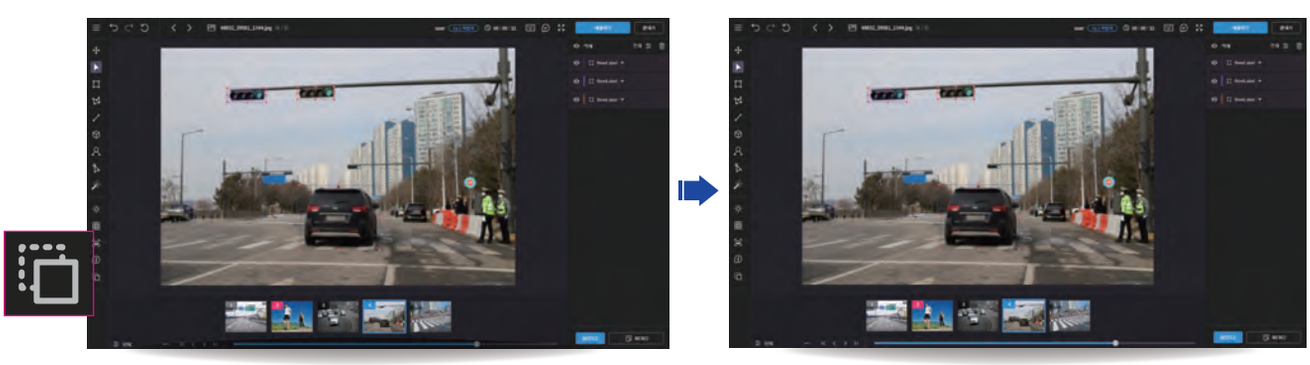
■ Steps to Support the Attribution



Supporting Specialized Features of Autonomous Driving

▪ Labeling Information Copy Function

By using labeling information copy function, task data from the previous data can be copied and pasted for faster & efficient work

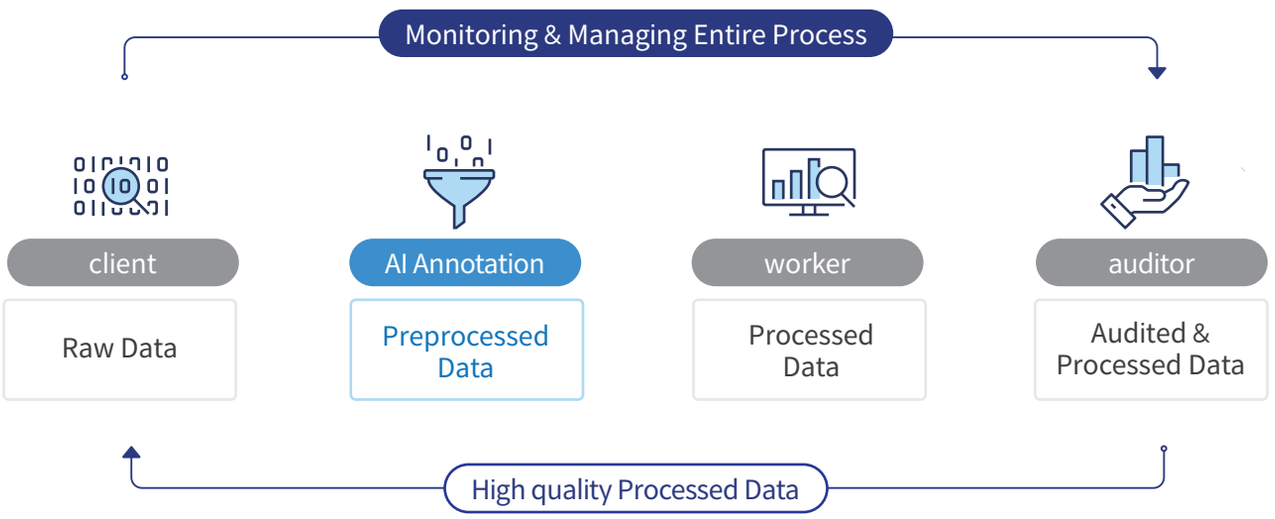


▪ Extraction of Accurate Results

The project in progress can derive accurate results by the process of rejection/ submission system

Systematic Project Management

Real-time project status provides efficient project environment

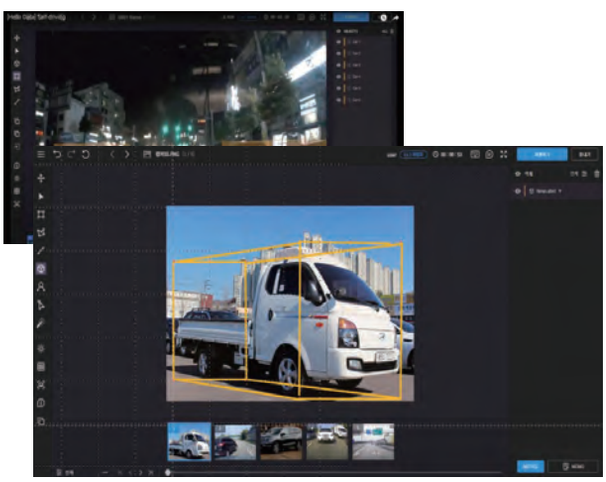


- Dashboard and Status statistics provided for project manager to manage project progress and worker/auditor status in real-time
- Worker invitation and statistics on project progress offers worker's throughput and schedules to the deadline
- Flexible re-allocation and modification of authorization of worker/auditor according to their information
- Issue/comment function provides real-time communication with worker/auditor on the task page

Application Cases of Autonomous Driving

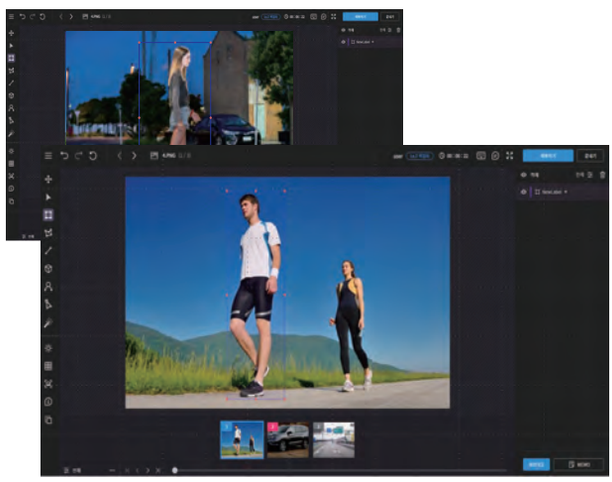
Vehicles

Various tools such as 3D cuboid, key point detection were used to annotate vehicles, lanes, specific vehicle types (SUV, Sedans, etc.)



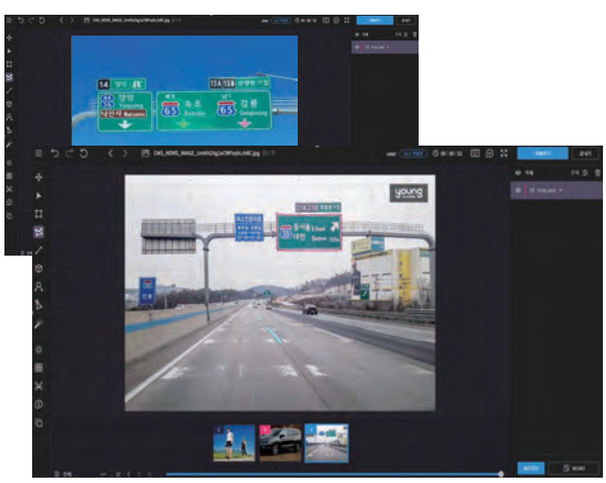
People

Processed data to track the locations of each joint part, such as arms, legs and shoulders



Road Signs

Supported AI model training with AI annotation to create training dataset of road signs



Geographic Feature

Processed data to track important geographical features (arrows, stop line, crosswalks, etc.) during the autonomous driving

Hello Data
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