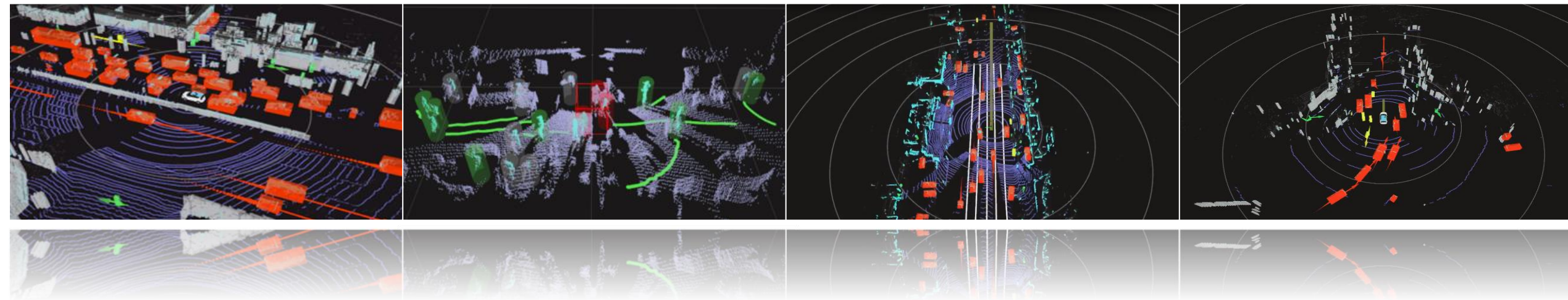




Making Robots Intelligent

SENSR-SMART 3D PERCEPTION ENGINE



AI 3D LiDAR COMPUTER VISION SOFTWARE COMPANY

About Seoul Robotics

Company Overview

Establishment

August 2017

Locations

HQ & RnD: Seoul, Gangnam.

US: Ann Arbor, Michigan

Business Area

Real Time 3D Computer Vision Software

Members

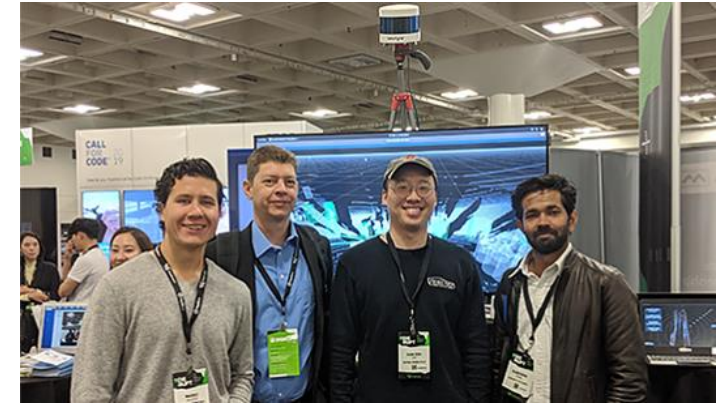
25+ Engineers / 5 Business & Operation

Customers



Investors Total Funding

\$7M

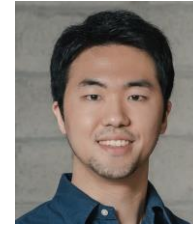


Leaders

Founders



Han Bin Lee (CEO)
International Business and Marketing
Penn State University (Mech. Eng.)
3D CFD research with GE



Jaeil Park, MSc (CTO)
3D Algorithm and Productization
Seoul National University (Mech. Eng.)
3D Software Engineer at 3D Systems



Oran Kwon (COO)
APAC Business and Operation
Sungkyunkwan University (Mech. Eng.)
3D Plant Designer at Samsung Engineering



Truong Hong Minh, PhD (Chief Scientist)
Machine Learning and Deep Learning
Toulouse III University (Mathematics)
3D Data Scientist at P3 Group (Airbus)

Business Leaders

Gabriel Cho,
senior business development
Senior Business Manager at Magna

David Han, MBA
NA Director-Automotive, North America
University of Michigan (MBA)
Marketing Director at Visteon and Ford

Engineers Background



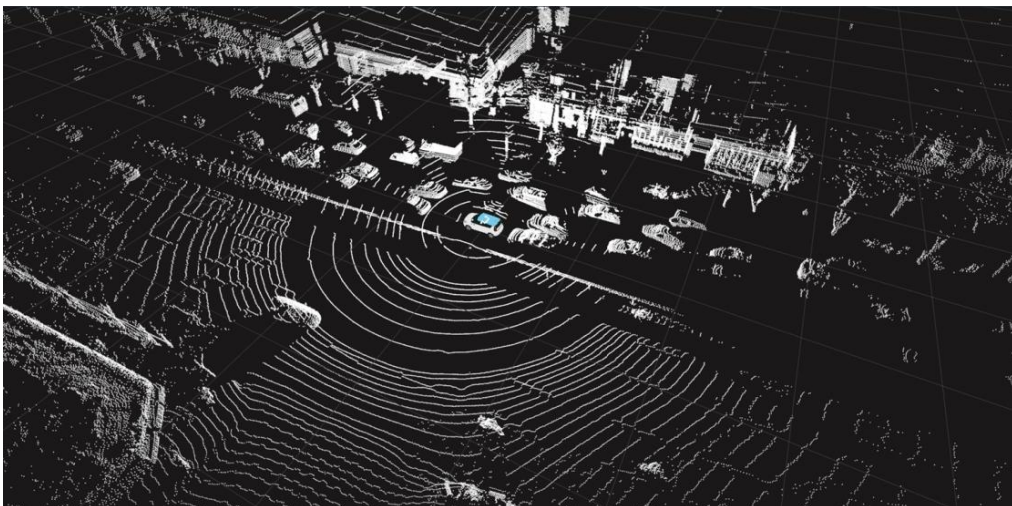
Why SENSUR?

Demand of Computer Vision Software for LiDAR

LiDAR accurately scans the surrounding environment in 3D (< 5 cm resolution) and it is free from personal information “Privacy” issue.

The technology is being applied in various industries: Security, Monitoring (Airport, Mart, etc.), Automotive, Heavy industries, Delivery robot

There are high level difficulties in processing LiDAR data in real-time. Thus, customers demand interpreted data rather than raw data, however, even LiDAR companies do not have the capability to deliver such solutions.



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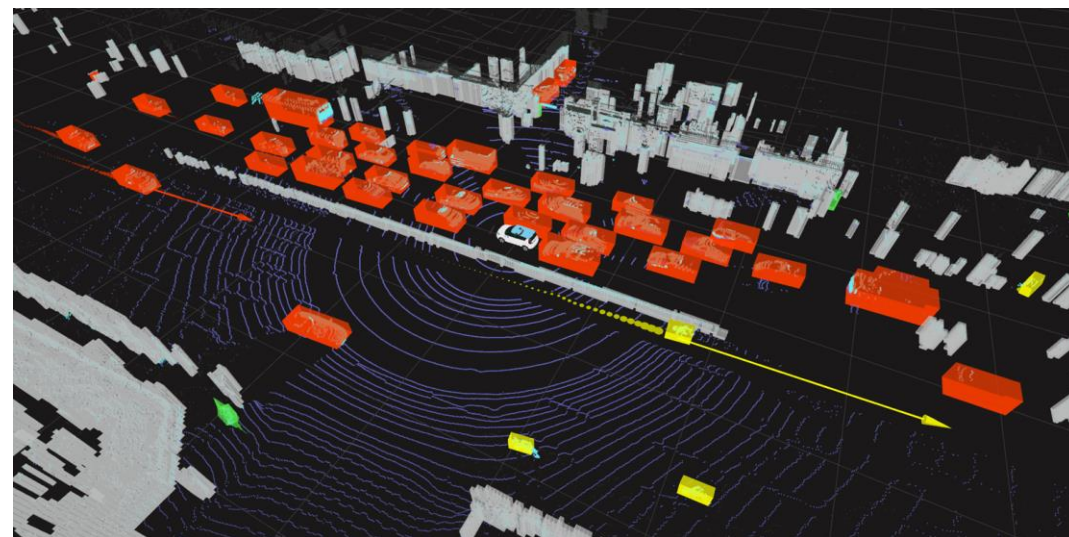
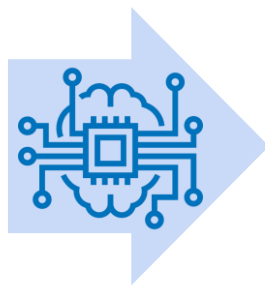
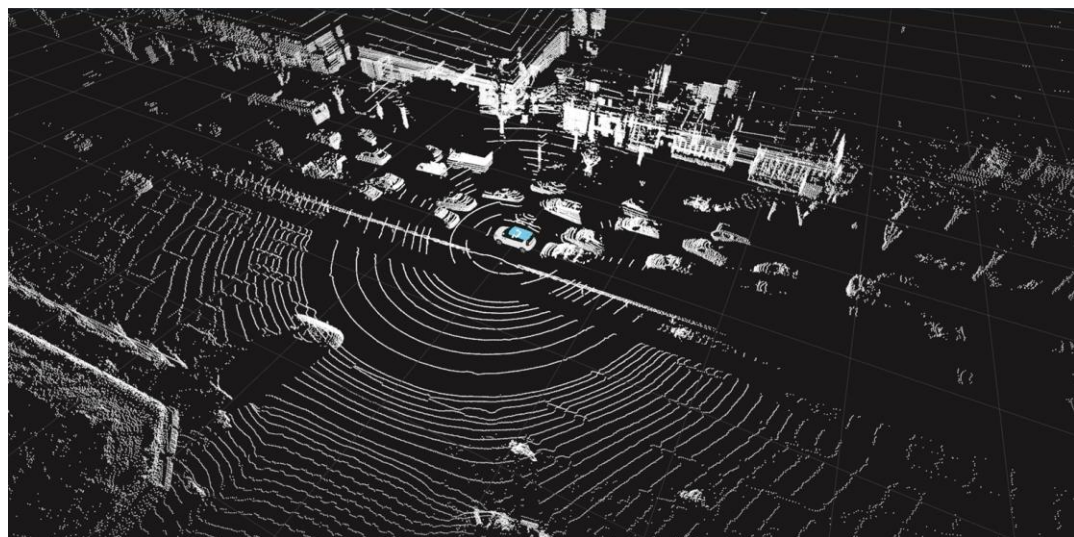
(X , Y , Z)
(1.36, 5.23, 1.27)
(1.45, 3.72, 1.49)
(3.15, 4.34, 2.56)
(9.43, 8.24, 5.78)
(3.13, 4.79, 3.28)
(7.57, 0.48, 2.37)
...



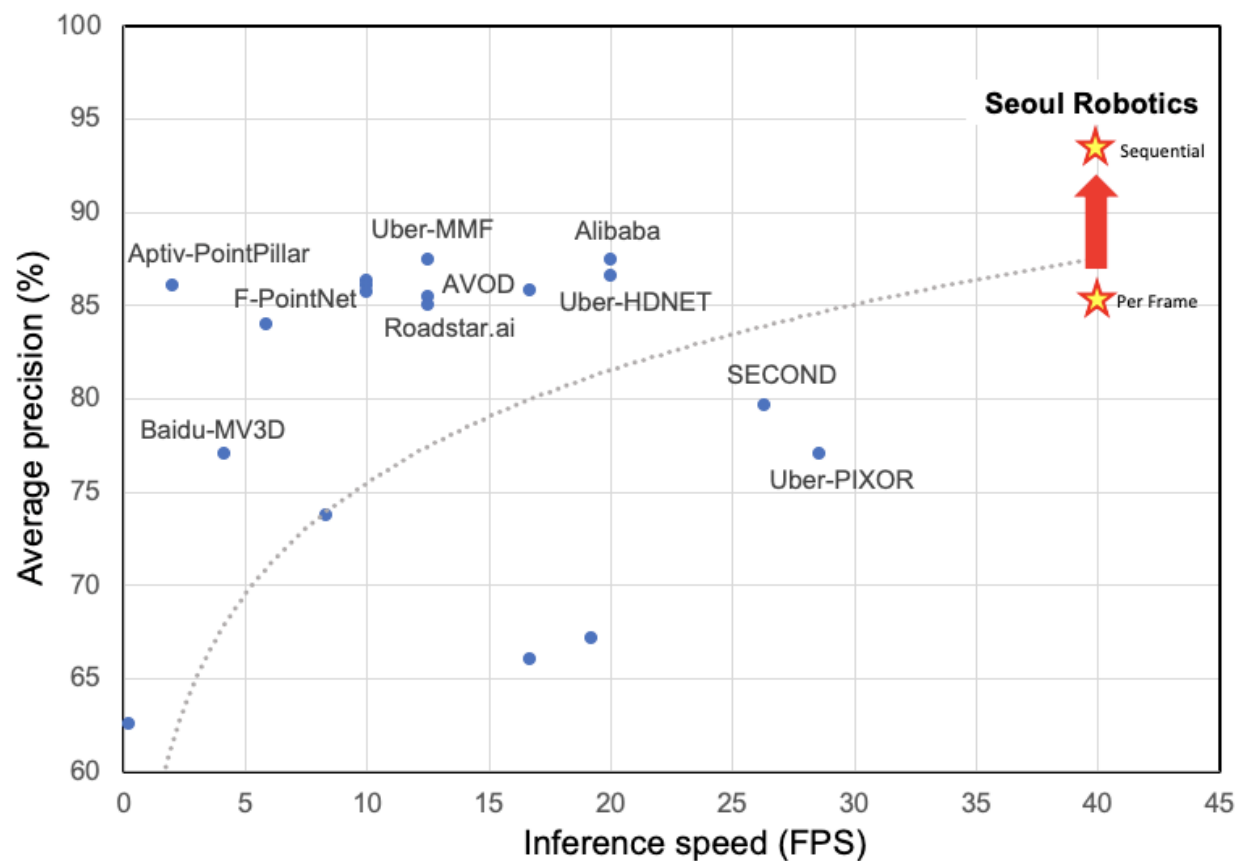
SENSR: AI 3D LiDAR Computer Vision Software

Mission: Helping computers understand 3D data

Product: **AI 3D Vision solution** for any industry with any LiDAR



Performance: No.1 in the World



- Ranked #1 in object detection for real-time LiDAR algorithm from KITTI Benchmark's, "the world's largest public benchmark". (7th in overall, November 2018).
- Continuing the assessment using our own database which contains more complex scenarios and various sensor data than public datasets such as KITTI

Sensor Agnostic: LiDAR Hardware Independent Software

- Seoul Robotics “SENSR” software operates regardless of LiDAR manufacturer and type (mechanical, solid state, etc.).
- We have partnerships with major LiDAR companies, and they are also using “SENSR” for software.
- **Seoul Robotics provide consulting service for selecting LiDAR type and installation location based on customer’s needs.**

Major LiDAR Partners

Velodyne LiDAR®



OUSTER



HESAI



INNOVIZ
TECHNOLOGIES



Partner



Global Leading LiDAR company (USA)
Official software supplier for Velodyne
Co-testing Velarray (solid state)
Co-developing 4+ projects



Global Leading LiDAR company (USA)
VCSEL type (targeting mass production)
Co-developing 2+ projects



Global Leading LiDAR company (China)
No.2 market share in US
Co-testing PandarGT (solid state)
Co-developing 1+ projects



BMW LiDAR supplier (Israel)
Non-spinning type LiDAR maker
Co-developing 1+ projects



Global No.1 GPU chip maker (USA)
Joined incubating program
(NVIDIA Inception Program)



**Global Top-tier Automotive
Embedded Solution Provider**
Joined R-Car Consortium as an official
lidar vision software provider

Customers



Customer behavior analysis project
Providing human detection and
tracking software

Applications & Case Demos

Applications

Velodyne LiDAR®



AI-powered algorithms

- Object detection
- Object tracking
- Object classification
- Volumetric profiling
- Motion prediction
- Lane detection
- Curbside detection
- Drivable ground



Automotive

- Self Driving (LV2 to LV5)
- Evaluation Platform



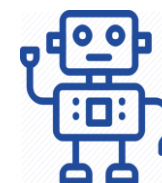
Smart Factory

- Industrial/Logistics



Smart City

- Security
- Behavioral Analysis



Robotics

- Automated Robots
- Delivery Robots

- SENSOR AGNOSTIC -

Mechanical / MEMS

Micro Motion / Solid State

SENSR-M for Mobility: Autonomous

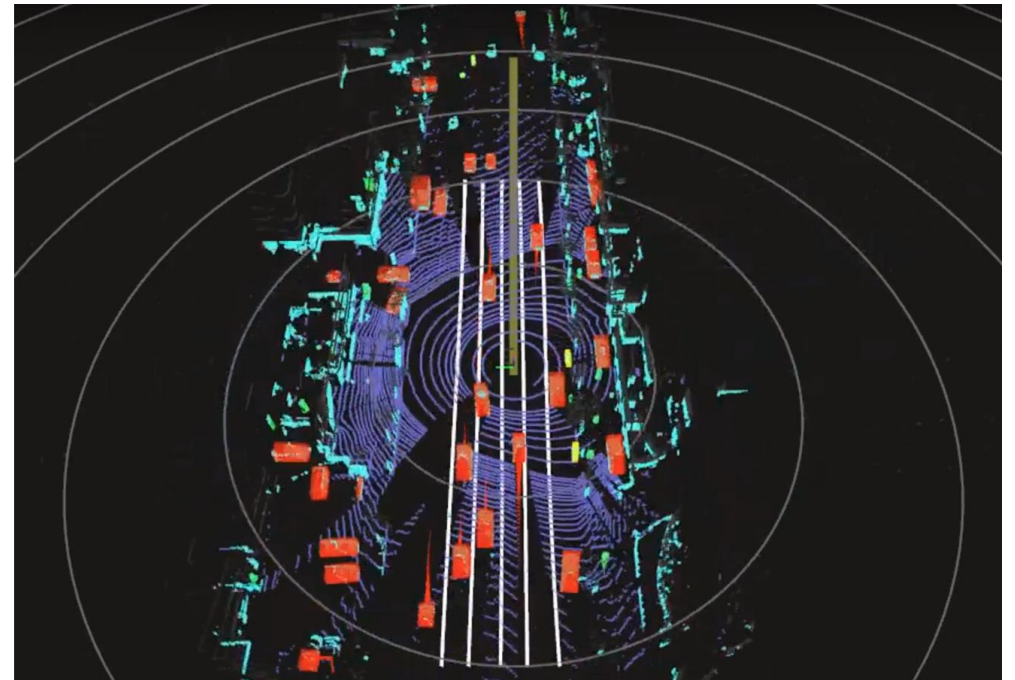
Real-time 3D computer vision solution without map data.

Features: Object detection, Classification (Human, car, cyclist and other), Object tracking and Motion prediction

Applications: Autonomous driving from ADAS (LV2) to Fully Autonomous (LV5)



<https://youtu.be/5xqPkGVMSEs>



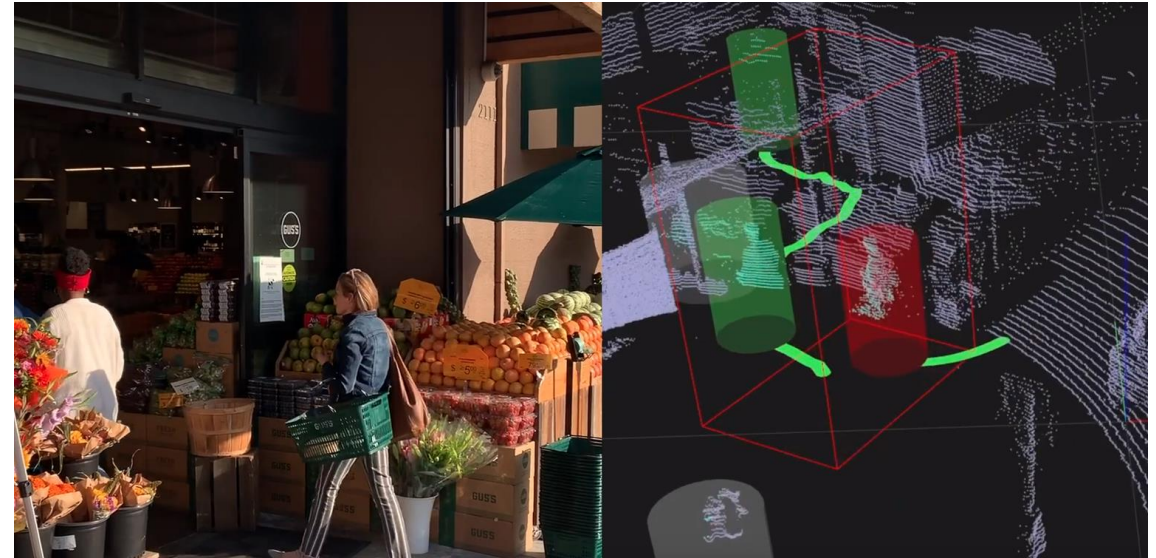
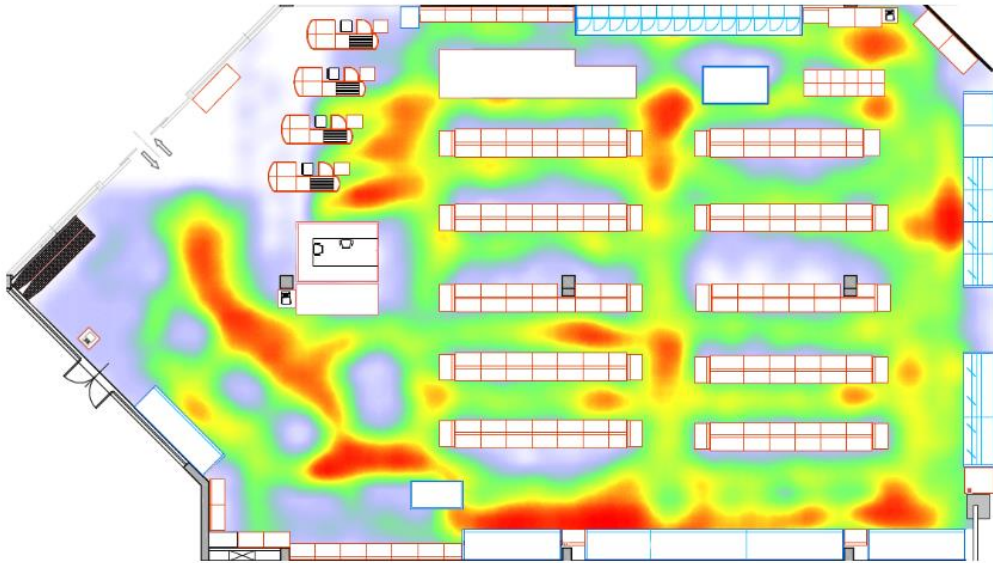
Perceiving surrounding situation while driving on the road

SENSR-I for Monitoring: Airport/Supermarket

Detect, locate and trace pedestrian in 3D space.

Features: Monitoring free from personal information “Privacy” issue as LiDAR does not identify individuals

Applications: Pedestrian/customer tracking and behavior pattern analysis in airport, supermarket, etc.



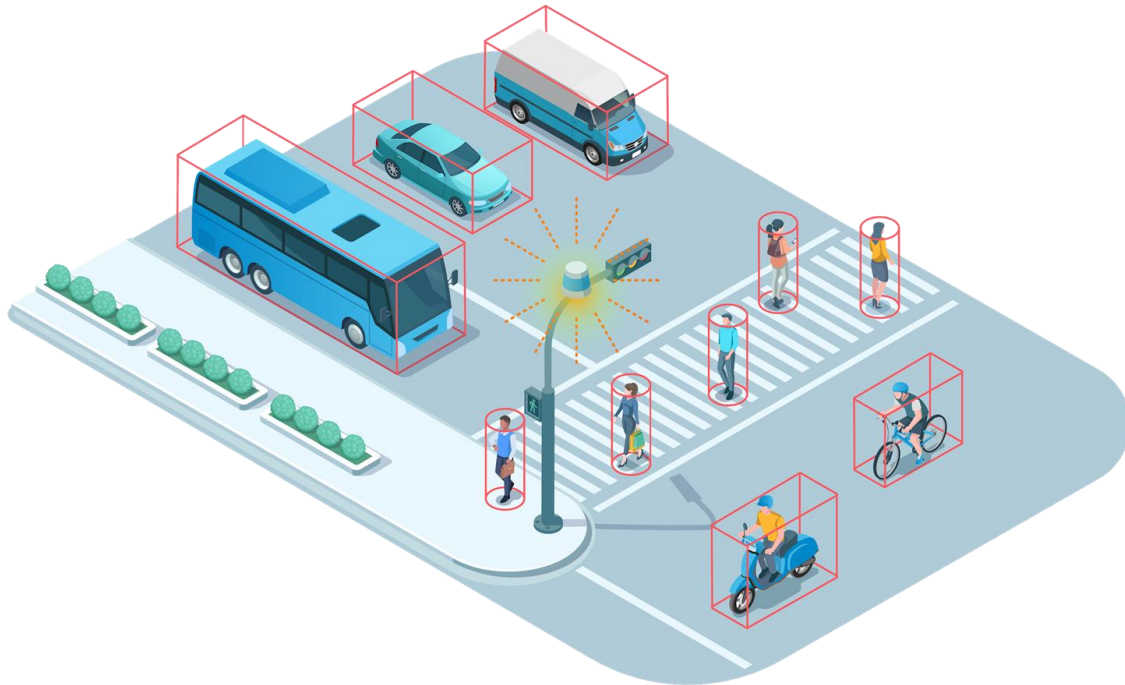
People detection and tracking result in supermarket

SENSR-S for Smart Infrastructure: Smart City

Accurate monitoring of surrounding objects from the infrastructure.

Features: Object detection, Classification and Tracking in 10 cm accuracy

Applications: Parking lot monitoring, traffic condition monitoring, security solutions



<https://youtu.be/RXRC26PeCbg>



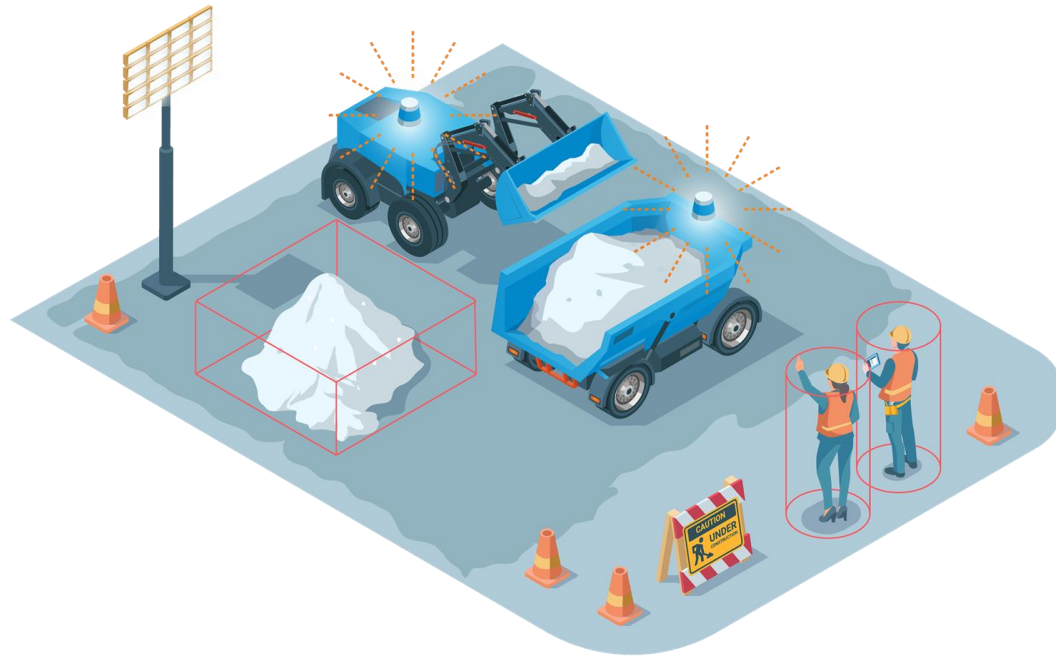
Vehicle and pedestrian recognition and tracking result in the parking lot

SENSR-S for Smart Infrastructure: Smart Factory/Robot

Recognition of surrounding environment in 3D for autonomous robot's decision making

Features: Detection, tracking and volumetric profiling of surrounding objects

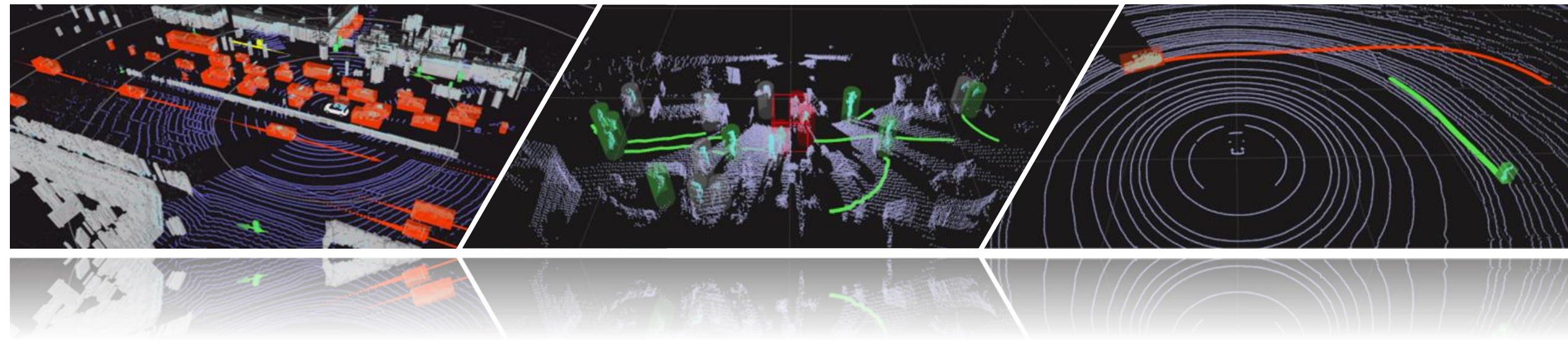
Applications: Construction/factory automation and delivery (Last-mile delivery) robot





Making Robots Intelligent

A WINDOW TO YOUR LiDAR



Contact: sales@seoulrobotics.org