
AESK
ALTERNATIVE ENERGY SYSTEMS SOCIETY

WHO WE ARE ?

Alternative Energy Systems Society was founded in 2004 by students of Yıldız Technical University. It was formed by the voluntary gathering of students who want to work on R&D on electric, hydrogen and autonomous vehicles.

We represent our country and our school successfully by participating in various competitions both at home and abroad.

Some of the competitions we participated in:

- Robotaxi-Full Scale Autonomous Vehicle
- Competition
- TUBITAK Efficiency Challenge
- International Unmanned Aerial Vehicle Competition

ACHIEVEMENTS

2021

- Hydromobile 1st Prize
- Autonomous Robotaxi 1st Prize
- Efficiency Challenge Domestic Product Prize

2020

- Hydromobile 1st Prize
- Electromobile 1st Prize
- Autonomous Robotaxi 2nd Prize
- Autonomous Robotaxi The Best Software Prize
- Efficiency Record Prize

2019

- Hydromobile 1st Prize
- Electromobile 2nd Prize
- Autonomous Robotaxi 1st Prize
- Efficiency Record PrizeTeknik
- Design Prize

2018

- Autonomous Robotaxi 1st Prize
- Hydromobile 1st Prize
- Electromobile 3rd Prize

ACHIEVEMENTS

2017

- Hydromobile 1st Prize
- Technical Design Prize

2016

- Hydromobile 1st Prize
- Domestic Product Prize 1st Place

2015

- Hydromobile 2nd Prize
- Electromobile 3rd Prize

2014

- Special Jury Prize

2013

- Hydromobile 1st Prize
- Technical Design Prize

2011

- Technical Design Prize

2007

- Hydromobile 1st Prize

2006

- Best Lap Time (Formula G / Solar Car Race)

AESK AUTONOMOUS TEAM

PROJECT ELECTRA

AESK Autonomous Team consists of 13 undergraduate members and 3 academic advisors. The team's goal is to build a level 5 autonomous vehicle with full driving capability and where all members are passionate about seeing their code on the road.

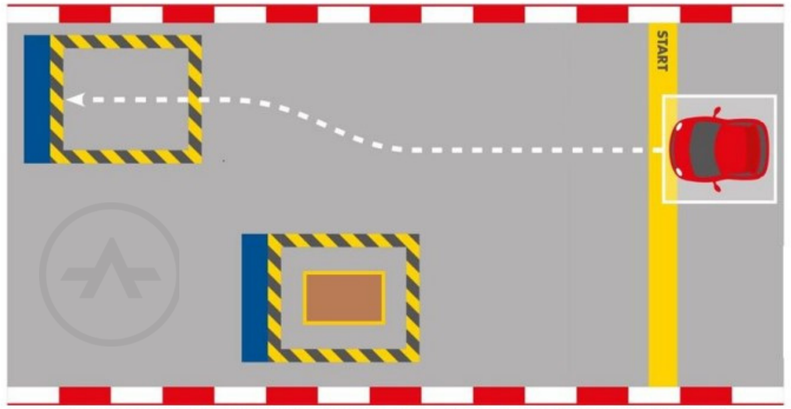
Autonomous team showcases its vehicle with three different projects. The project areas are in our university campus, in Turkey and Europe.

Shell Eco-marathon®

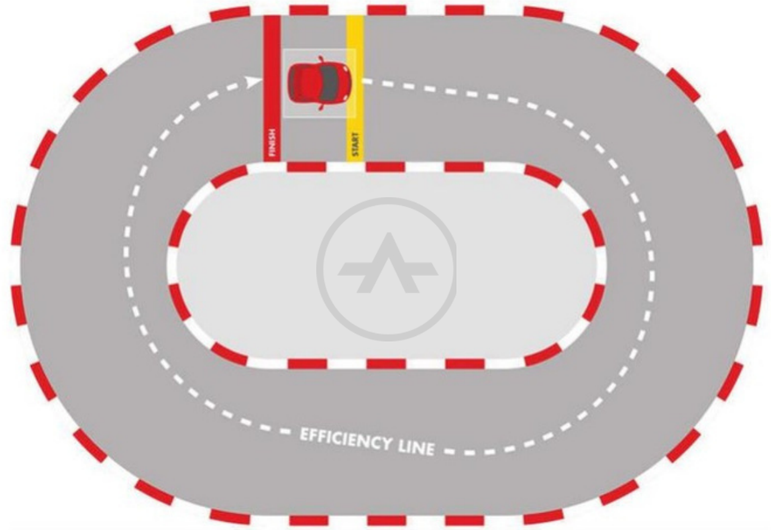
AUTONOMOUS URBAN CONCEPT CHALLENGES

The challenges for the AUC are:

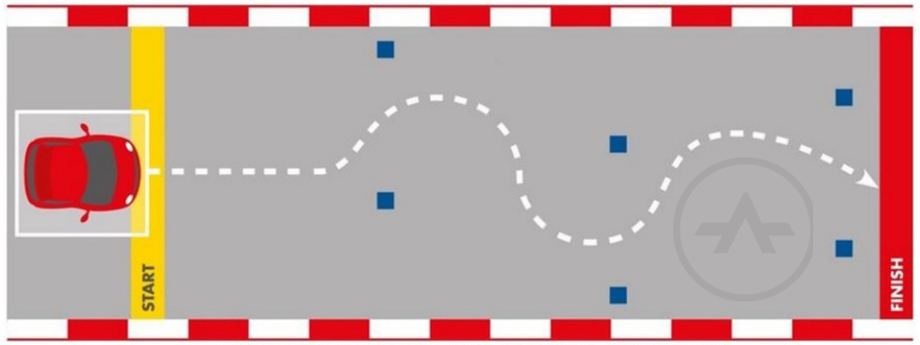
1. Driving Autonomously
2. Parking Manoeuvrability
3. Obstacle Avoidance
4. Business Presentation



CHALLENGE 2 SCHEMATIC: PARKING MANOEUVRABILITY



CHALLENGE 1 SCHEMATIC: AUTONOMOUS DRIVING



CHALLENGE 3 SCHEMATIC: OBSTACLE AVOIDANCE

ROBOTAXI-FULL SCALE AUTONOMOUS VEHICLE COMPETITION

In the competition, it will be expected to perform various tasks autonomously in a real racetrack environment that is similar with map. The main purpose of the competition is to develop autonomous driving algorithms.

UNIVERSITY CAMPUS SHUTTLE PROJECT

Our aim is to complete the autonomous shuttle service with our prototype vehicle by making an HD map of our campus. Our project of integrating our algorithms, of which tests were completed, into the buses of the campus, is among our goals.

FEATURES OF ELECTRA

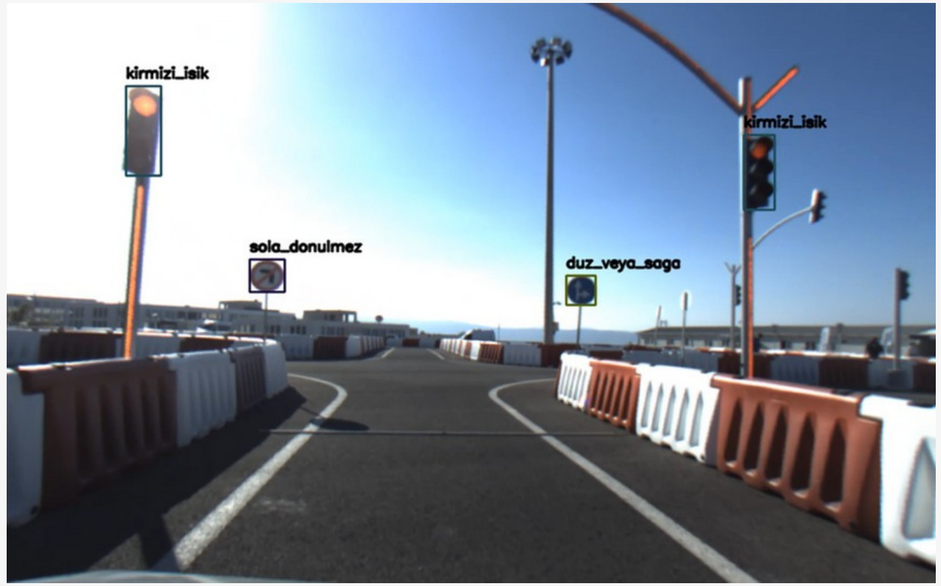
1. SIMULATION
2. OBJECT DETECTION
3. PATH DETECTION
4. SENSOR FUSION
5. PLANNING AND NAVIGATION
6. CONTROL
7. PARK

SIMULATION

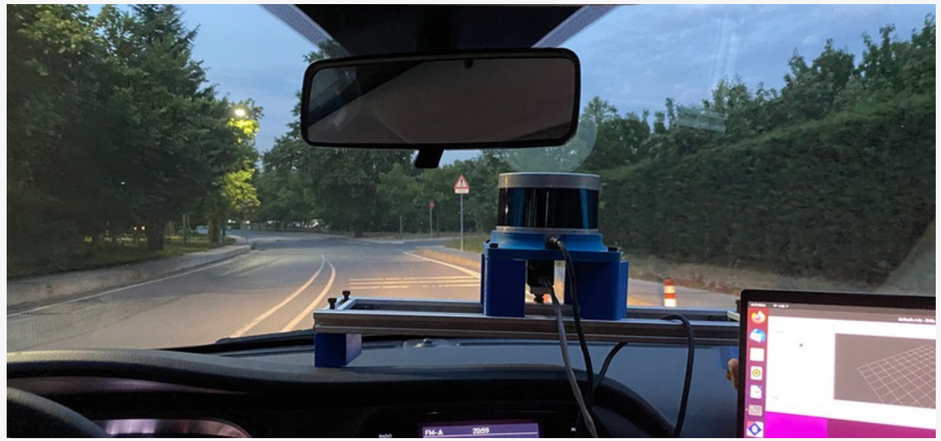
Our simulation environment was originally designed by our team with the unity game engine. Our car Electra has been modeled to get more accurate results. It is an important part that separates us from other teams in terms of autonomous driving.

OBJECT DETECTION

With our original dataset (include 165.000 data) collected for the purpose of detecting objects and signs in the city, our artificial neural network has the ability to detect the environment with high accuracy.

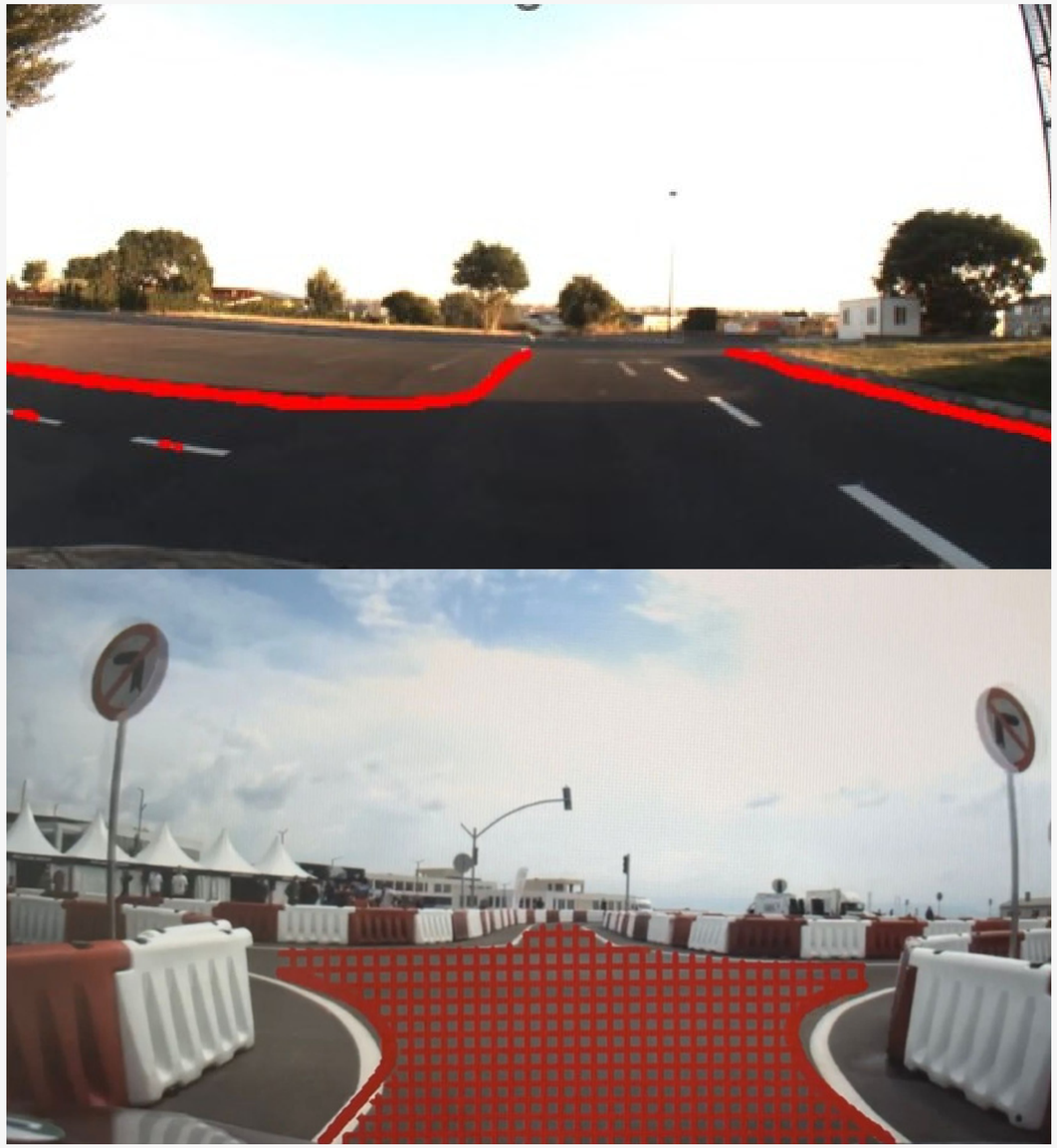


165000



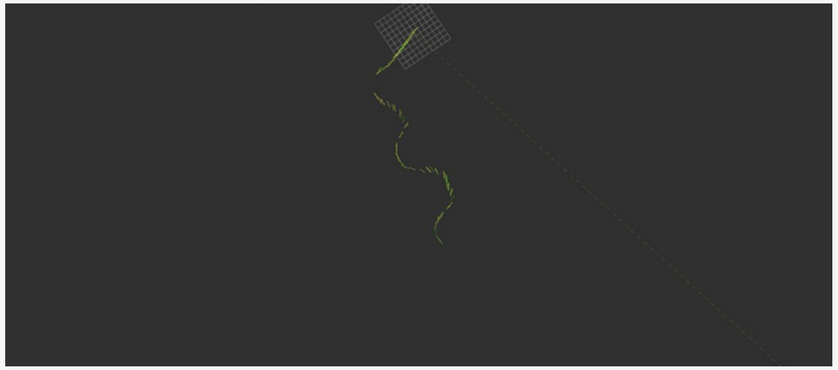
PATH DETECTION

With lane detection neural network algorithm, Electra can detect lanes and drivable areas. Thus it can drive autonomously on all roads it encounters.

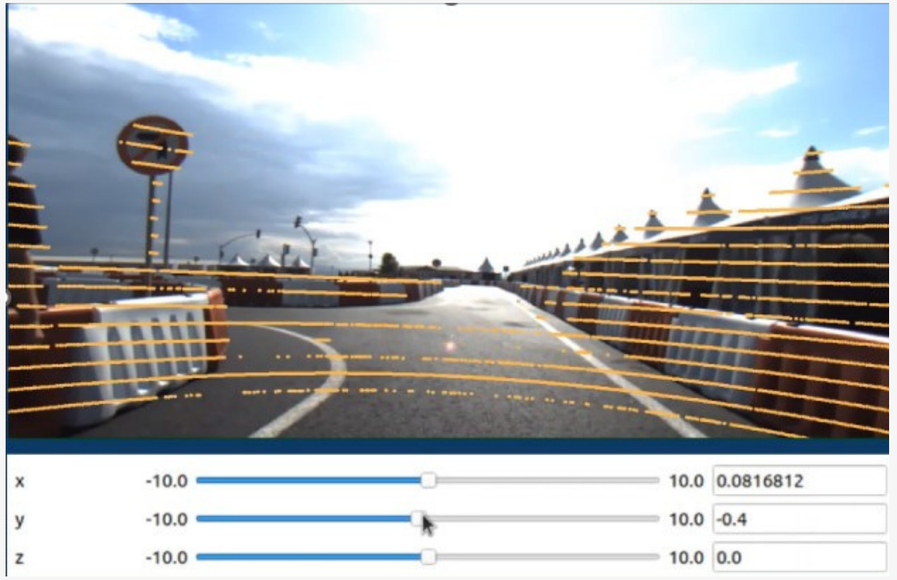


SENSOR FUSION

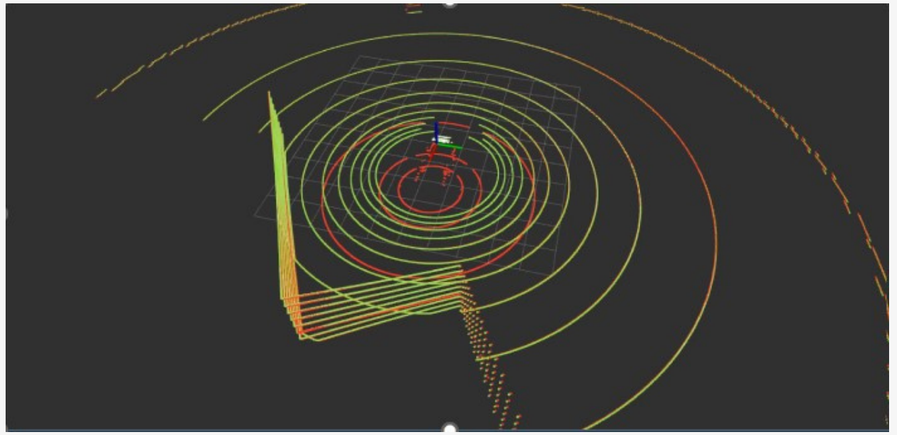
With its lidar, camera, gps and imu sensors, Electra can detect its surroundings and follow the appropriate roads on the roads. In order for all these sensors to work integrated with each other, the sensors in the vehicle are calibrated. In order to obtain the most accurate data, high-accuracy sensors are used.



Odometry data, outcome of gps-imu fusion



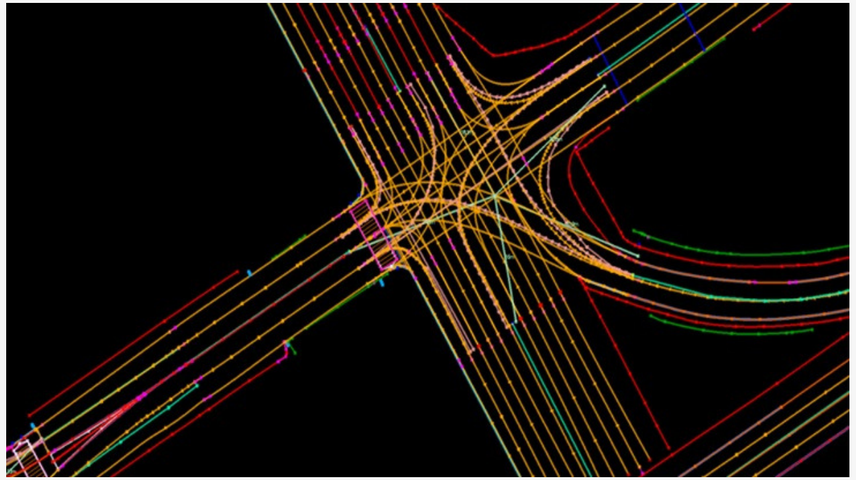
LIDAR - CAMERA FUSION

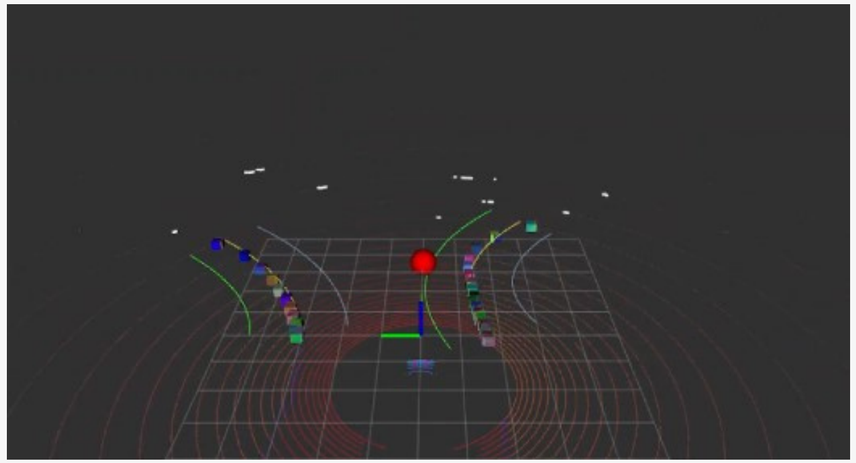


LIDAR - LIDAR FUSION

PLANNING AND NAVIGATION

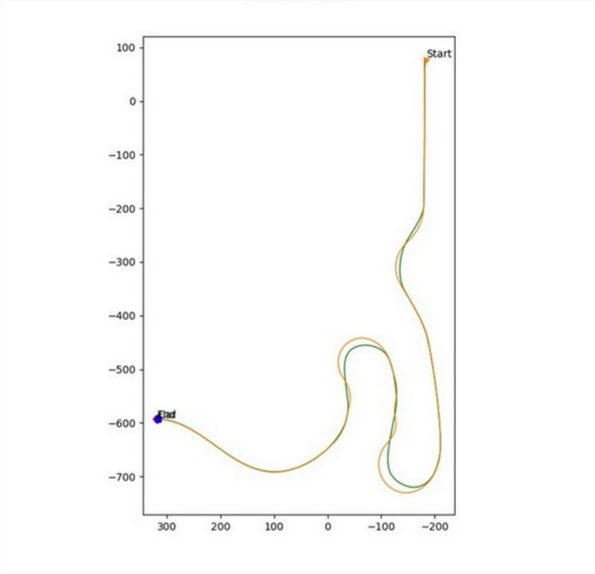
As a result of processing the data coming from the sensors, the target points where the Electra can go are extracted with the original algorithms written by our team by using the strips detected by artificial neural networks.



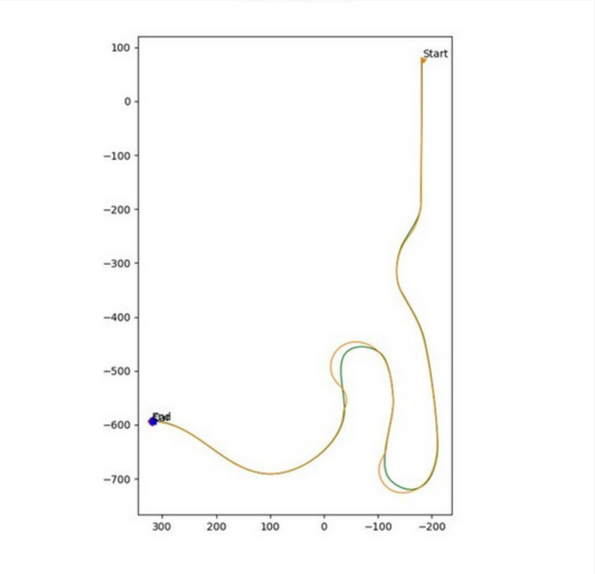


CONTROL

We can provide steering control of electra with our control codes written for the purpose of following the target points and the path produced for electra.



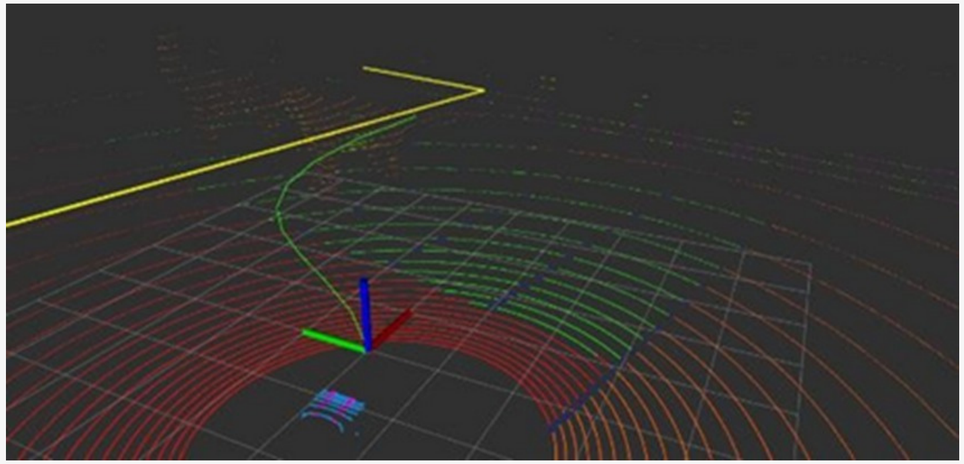
STANLEY ALGORITHM SIMULATION RESULT



PID ALGORITHM SIMULATION RESULT

PARKING ALGORITHM

Electra can detect the appropriate parking point and perform the parking task by following the route drawn to the appropriate area.



PARKİNG ALGORITHM WAYPOINTS


POYRAZ
BEEM
İTÜ GÜNEŞ ARABASI EKİBİ
LEO
DRIVE
roboflow
MTM
KALE
OTO RADYATÖR
AESK

THANK YOU

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