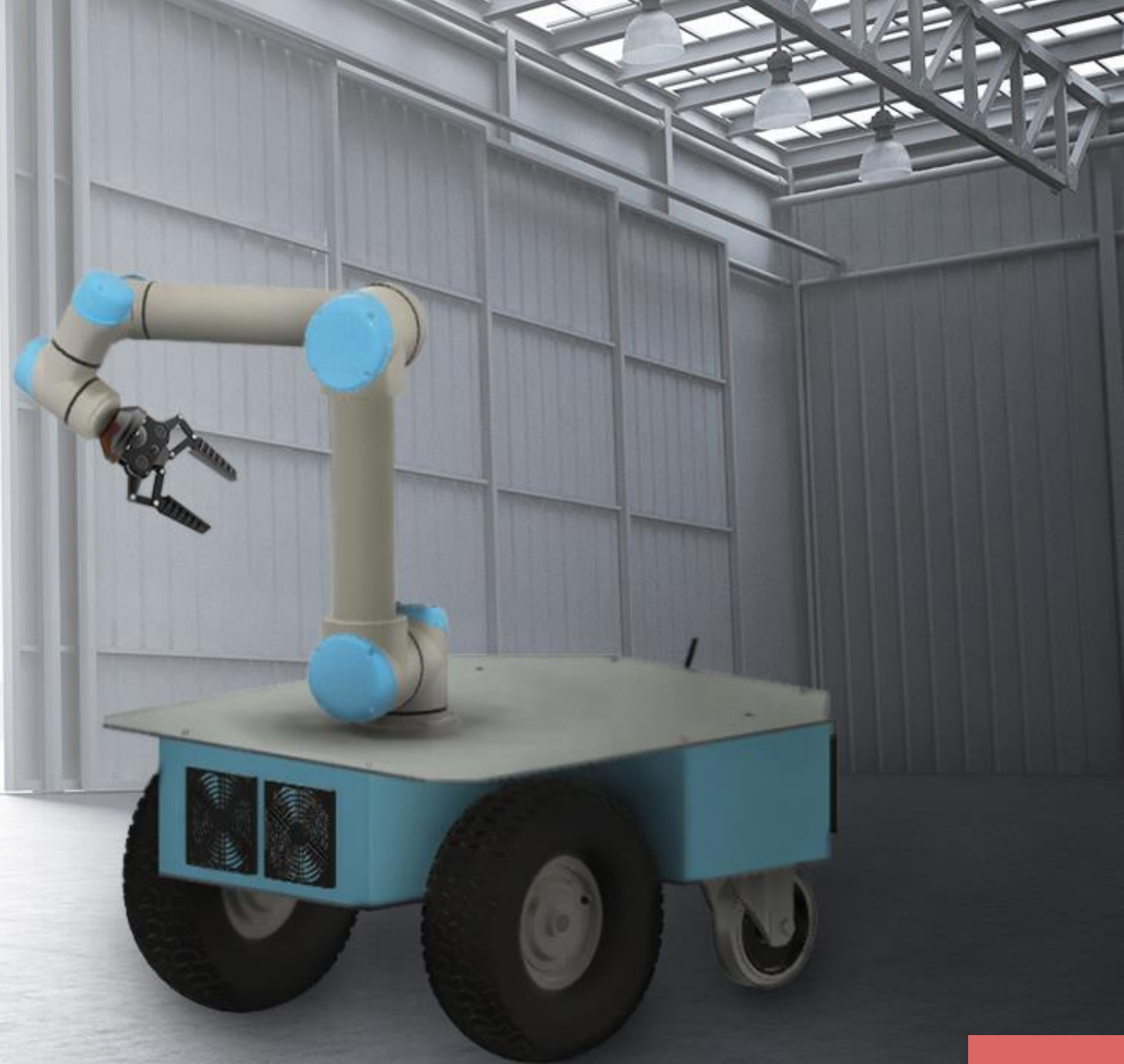


ROBO TECH

Vision

Development of
autonomous robots
with AI elements

■ **Ing. Martin Smolák, CEO**
www.robotechvision.com



ABOUT US

RoboTech Vision Ltd. was established in 2013. It consists of six members, who have experience with a variety of devices, types of robotic chassis, and AI.

■ Specialization

Development of own mobile robotic platforms and universal autonomous navigation algorithms with elements of artificial intelligence.

■ Universality first

Ability to autonomously navigate different types of mobile robotic platforms but also their usability in different industries (agriculture, geology, healthcare, military, space, etc.)

■ Software with AI

Neural networks for classification and recognition (objects, faces, speech to text, ...), image processing, almost all kinds of programming languages according to needs of GUI or local on-board high-performance algorithms and our robotic platforms are ROS compatible.



FOCUS

■ Mobile robotics

Own robotic platforms on which company deploys its AI software.

■ AI and neural networks

Robots can learn and gain knowledge and use it to perform various tasks.

■ Navigation algorithms

Autonomous navigation and route planning on road, offroad by map or vision.

■ Visual systems

Recognizing objects, faces, car registration numbers and tracking or avoiding objects.

■ Voice control

Thanks to the Speech to text algorithm, devices can be controlled by voice from an app.

■ Customized solutions

Specific tasks in which robots equipped with AI algorithms independently solve complex tasks.



[Watch the video »](#)



[Watch the video »](#)

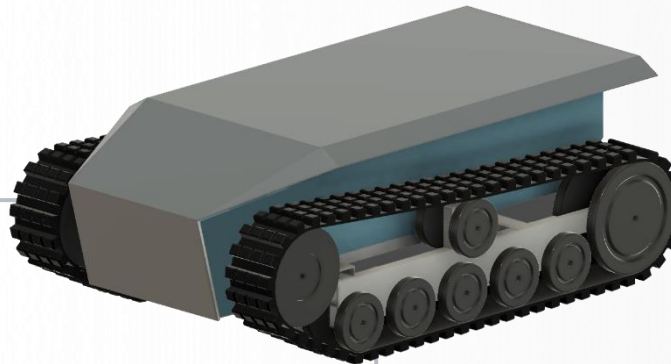
ROBOTIC PLATFORMS



Caster robot

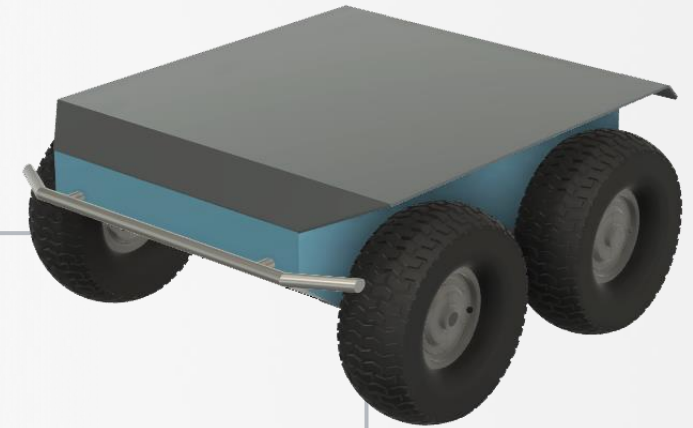
Versatile platform designed for both indoor and outdoor areas. The robot's base is a differential wheel chassis. Device can safely carry loads of up to 75 kilograms.

[More »](#)



Crawler robot

Platform designed for outdoor environment, specially for agricultural purpose. It can be supplemented by tools like robotics arm.



Differ robot

Robot designed for outdoor conditions. It is versatile and durable platform for 24/7 operation. The main function is autonomous patrolling and inspection in unattended objects.

DEVELOPMENT



■ Androver II – testing platform

Androver II is completely developed by RoboTech Vision from the ground up and its kinematics is defined by Double Ackerman chassis which ensured easier passage through the terrain. Robot is used for developing our autonomous navigation for agriculture.

Androver II won first place in an international competition in the autonomous navigation category. The robot represented the acquired know-how of the company and served for presentation purposes too. For example, it passed tests at the ESA.

It has four 500 W BLDC Hub motors enabling it to carry a load capacity of 40 kg and reach a maximal speed about 35 km/h. Its operational time with Lead-Acid VRLA (3 x 12V/35Ah) batteries was 3 – 4 hours.

Its commercial successor is a robot called a Crawler.

DEVELOPMENT



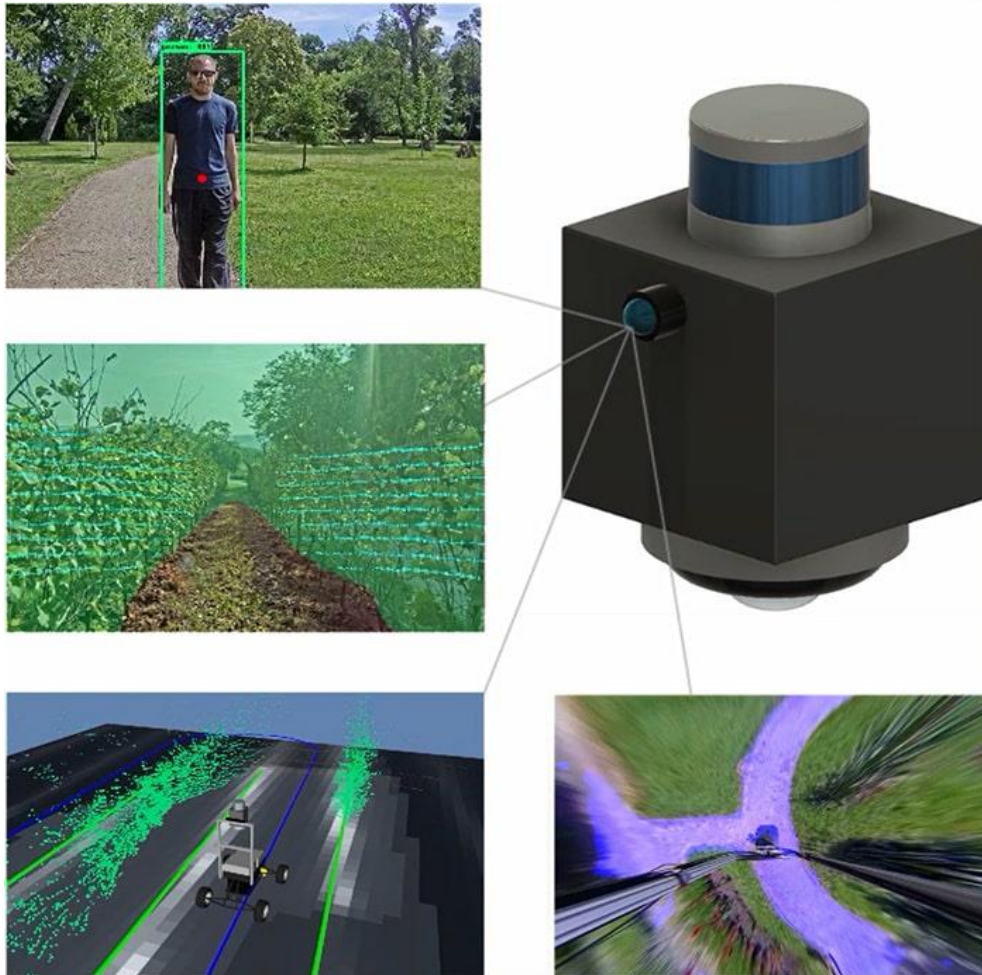
■ Husky A200 – testing platform

RoboTech Vision decided to adapt its autonomous outdoor navigation algorithms also to devices with differential kinematics. The company used a Husky A200 mobile robot by the Canadian company Clearpath.

Husky has been modified by RoboTech Vision. A modification of the sensory system was made. To increase the computing power for neural networks, a GPU was added to Husky, which also required the cooling of the entire system.

Its commercial successor is a robot called a Differ.

DEVELOPMENT



■ RTV sensor Box – own sensory system

Sensor was developed by RoboTech Vision to ease the development process of several autonomous navigation algorithms.

It consists of forward-view camera, 360° camera and 3D laser scanner those are calibrated against each other.

This sensor also has its own CPU and GPU and in addition to raw data it offers output such as: detected object bounding-boxes data (position, label and success rate, and live stream to camera image), road segmentation mask, LiDAR 2D projection mask, subtraction of 2D LiDAR mask a road mask, etc.

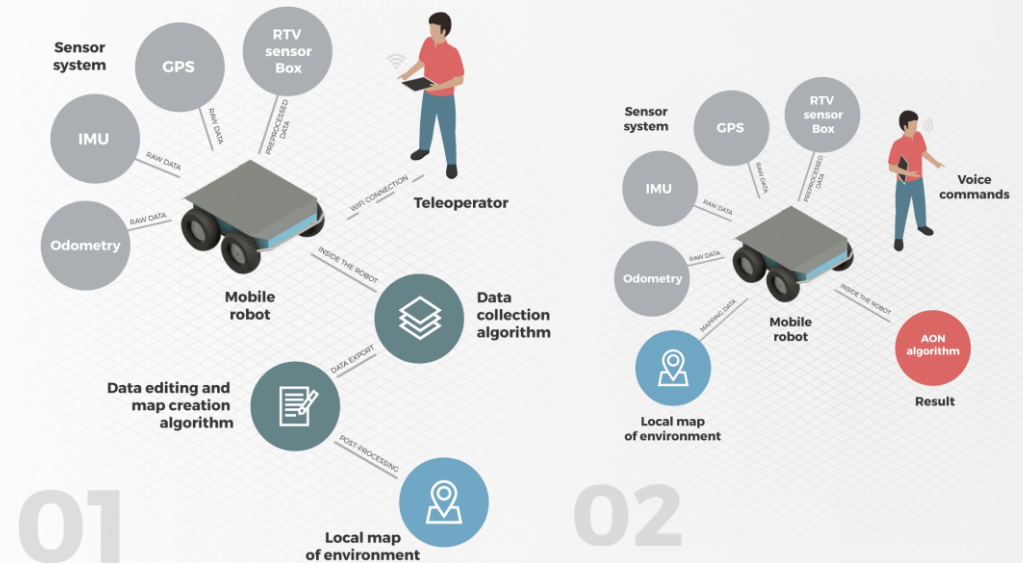
RoboTech Vision is developing its more advanced version RTV sensor Tower now.

AON ALGORITHM

AON -Autonomous outdoor navigation

Software solution with which the robot can move on paved roads without collisions and without human intervention. The teleoperator first maps the surroundings with the robot, which results in a local map of the environment. Thanks to the sensor system, the robot autonomously navigates the specified route. Commands can be entered using the application by marking a location on the map or by voice.

The software ensures the crossing of difficult intersections and the avoidance of static and dynamic obstacles. Algorithm can be modified for deployment on various robotic platforms, but autonomous navigation requires the necessary sensor equipment. The optimal solution is to use one of our robotic platforms equipped with an RTV sensor Box. It is currently possible to navigate indoors using the AON algorithm and the RTV sensor Box.



Thank you!