



AUTONOMOUS VEHICLE

ENGINEERING DESIGN

BLUEPRINT

I. Concept

II. History

III. The need for autonomous

IV. Current users

V. Technology

BLUEPRINT

VI. Concept we are working on

VII. Motion control

VIII. Digital Mapping

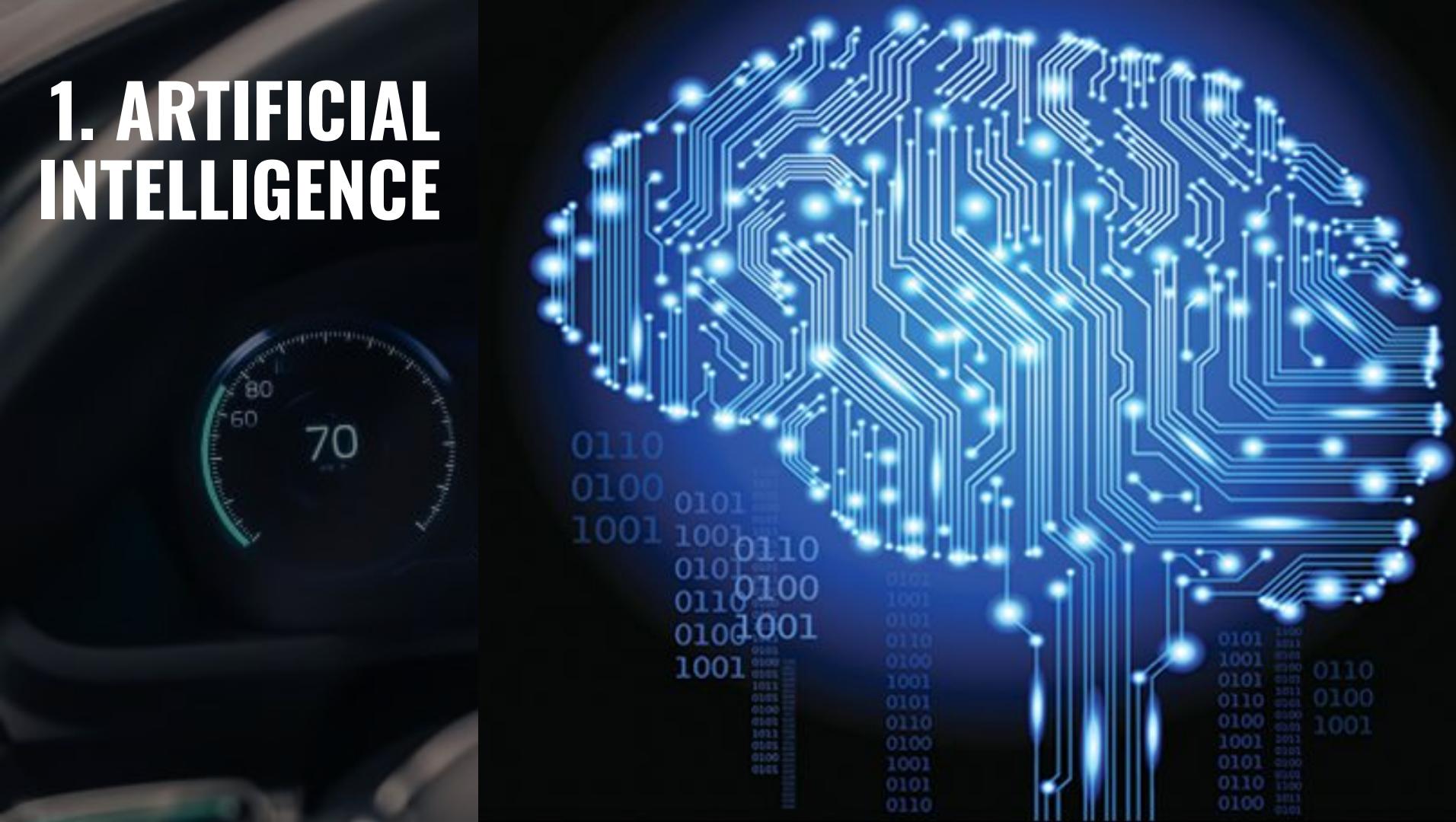
IX. Our view on autonomous vehicles

X. Reflections

CONCEPT

Next:
Autonomous driving ends at Eriksbergsmotet

1. ARTIFICIAL INTELLIGENCE





2. AUTOMATES DRIVING



HISTORY OF AUTONOMOUS CARS



A photograph of the interior of a futuristic autonomous vehicle. The dashboard features a large, curved digital display showing a map of a coastal area with a beach and ocean. The steering wheel is on the right side. The interior is minimalist and spacious, with light-colored leather seats and a polished wooden floor. The overall aesthetic is clean and modern.

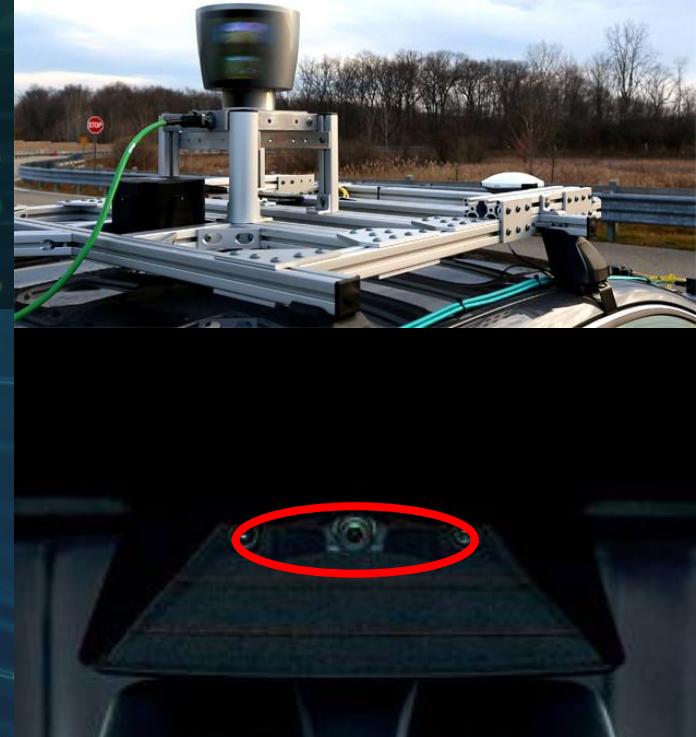
Why the need for autonomous vehicles?

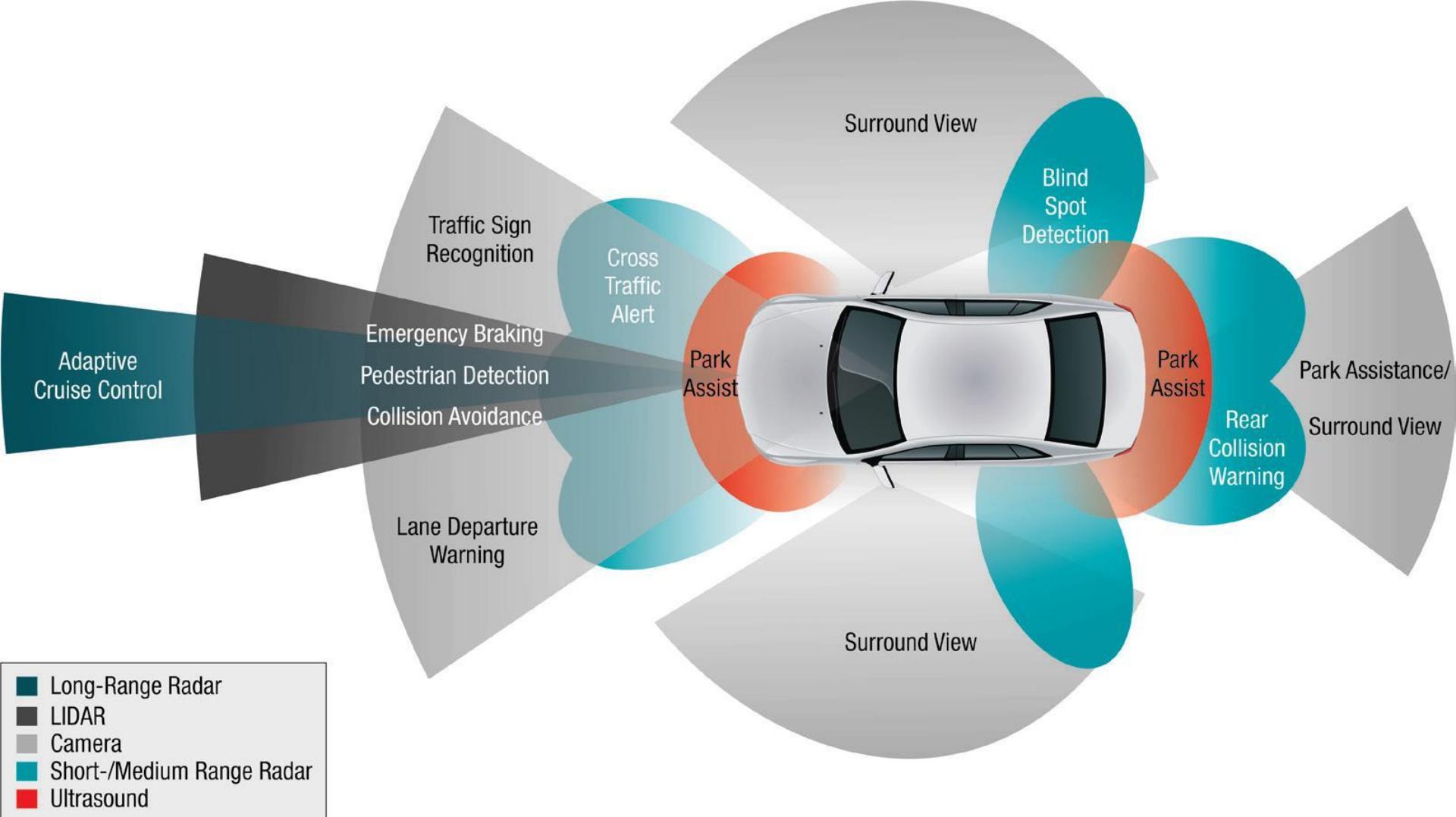
ADOPTERS OF THIS VISION



TECHNOLOGY

- I. Long-range radar
- II. Short/medium-range radar
- III. LIDAR
- IV. Visual (Cameras)
- V. Ultrasound



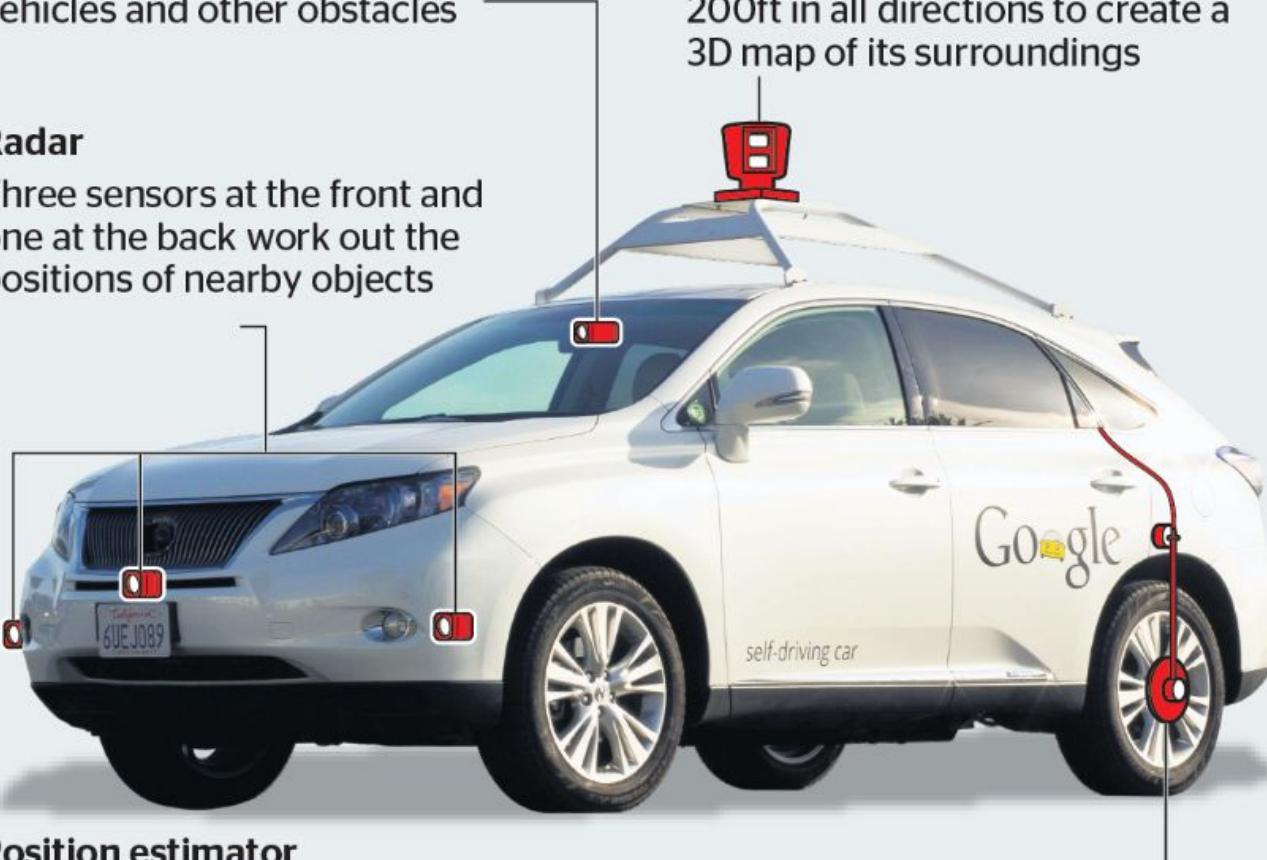


Video camera

Detects traffic lights, oncoming vehicles and other obstacles

Radar

Three sensors at the front and one at the back work out the positions of nearby objects



Lidar

A rotating sensor on the roof scans 200ft in all directions to create a 3D map of its surroundings

Position estimator

A sensor on the left rear wheel measures the car's movements so that its position can be mapped with accuracy

WHAT WE DID

Research & Development

SELF-DRIVING CAR



safe



accurately



no traffic



BASICS



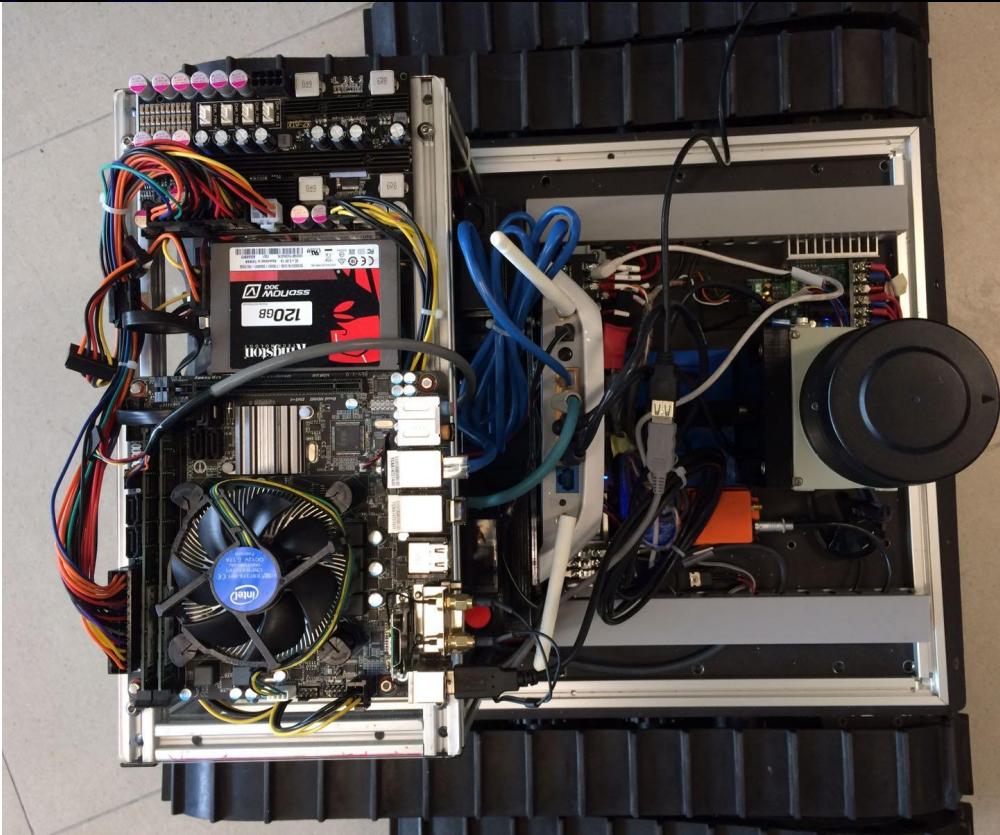
ubuntu



OUR PROJECT



Original Drrobot Jaguar



MOTION CONTROL



```
/home/titansx01/catkin_ws/src/learning_joy/launch/turtle_joy.launch http://localhost:11311
titansx01@titansx01-VirtualBox:~$ source ~/catkin_ws/devel/setup.bash
titansx01@titansx01-VirtualBox:~$ rosrun learning_joy turtle_joy.launch
... logging to /home/titansx01/.ros/log/44ea130a-bc41-11e6-b02e-0800275af2d2/ros
launch-titansx01-VirtualBox-30263.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://titansx01-VirtualBox:45966/
SUMMARY
=====
PARAMETERS
  * /axis_angular: 0
  * /axis_linear: 1
  * /rosdistro: indigo
  * /rosversion: 1.11.20
  * /scale_angular: 2.0
  * /scale_linear: 2.0
  * /turtle_joy/deadzone: 0.12
  * /turtle_joy/dev: /dev/input/js6

NODES
/
  sim (turtlesim/turtlesim_node)
  teleop (learning_joy/turtle_teleop_joy)
  turtle_joy (joy/joy_node)

ROS_MASTER_URI=http://localhost:11311

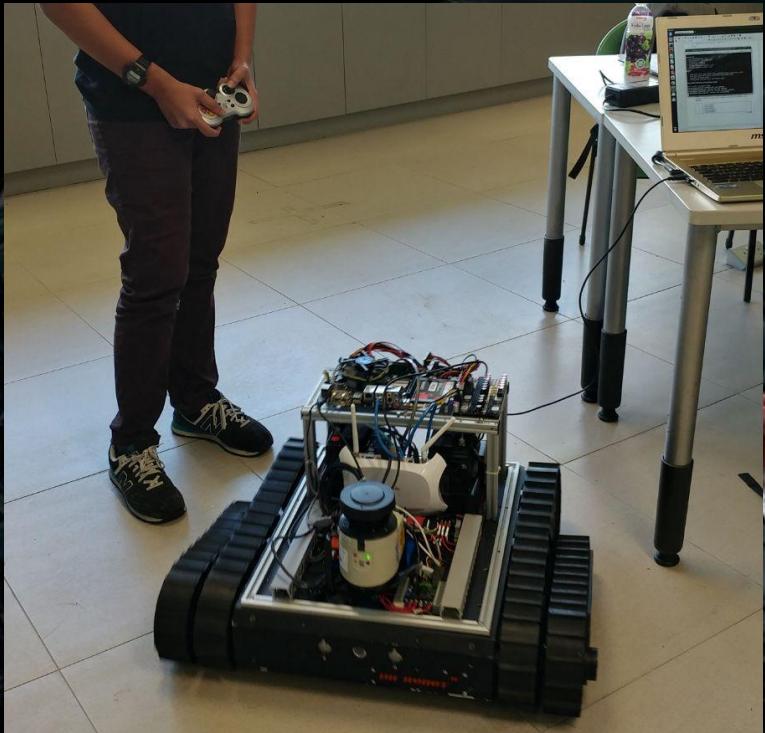
core service [/rosout] found
process[sim-1]: started with pid [30281]
process[turtle_joy-2]: started with pid [30282]
process[teleop-3]: started with pid [30283]
```



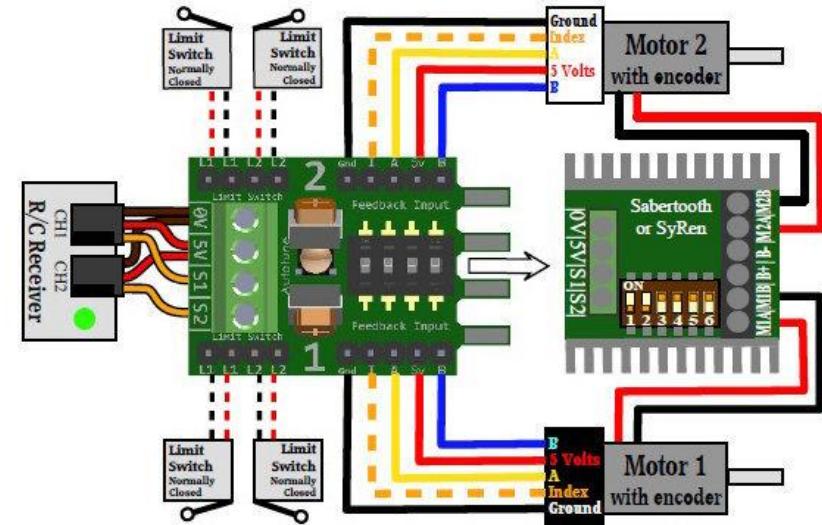
MOTION CONTROL (TurtleBot)

MOTION CONTROL

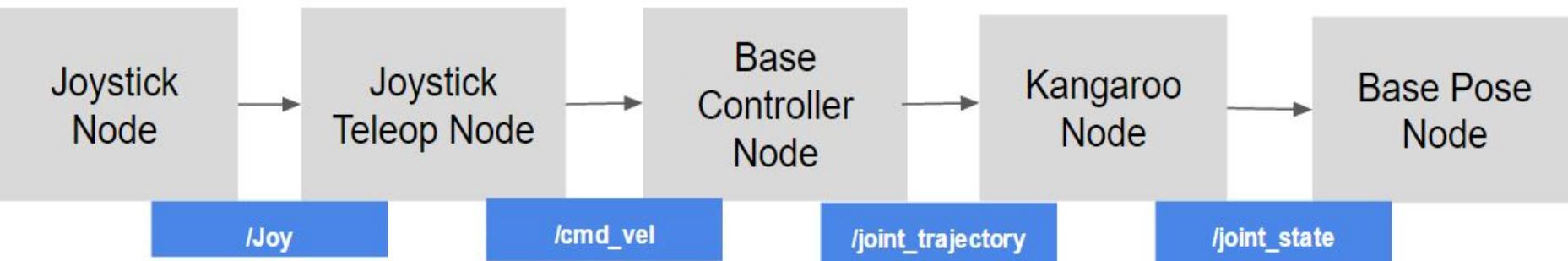
(JaguarBot)



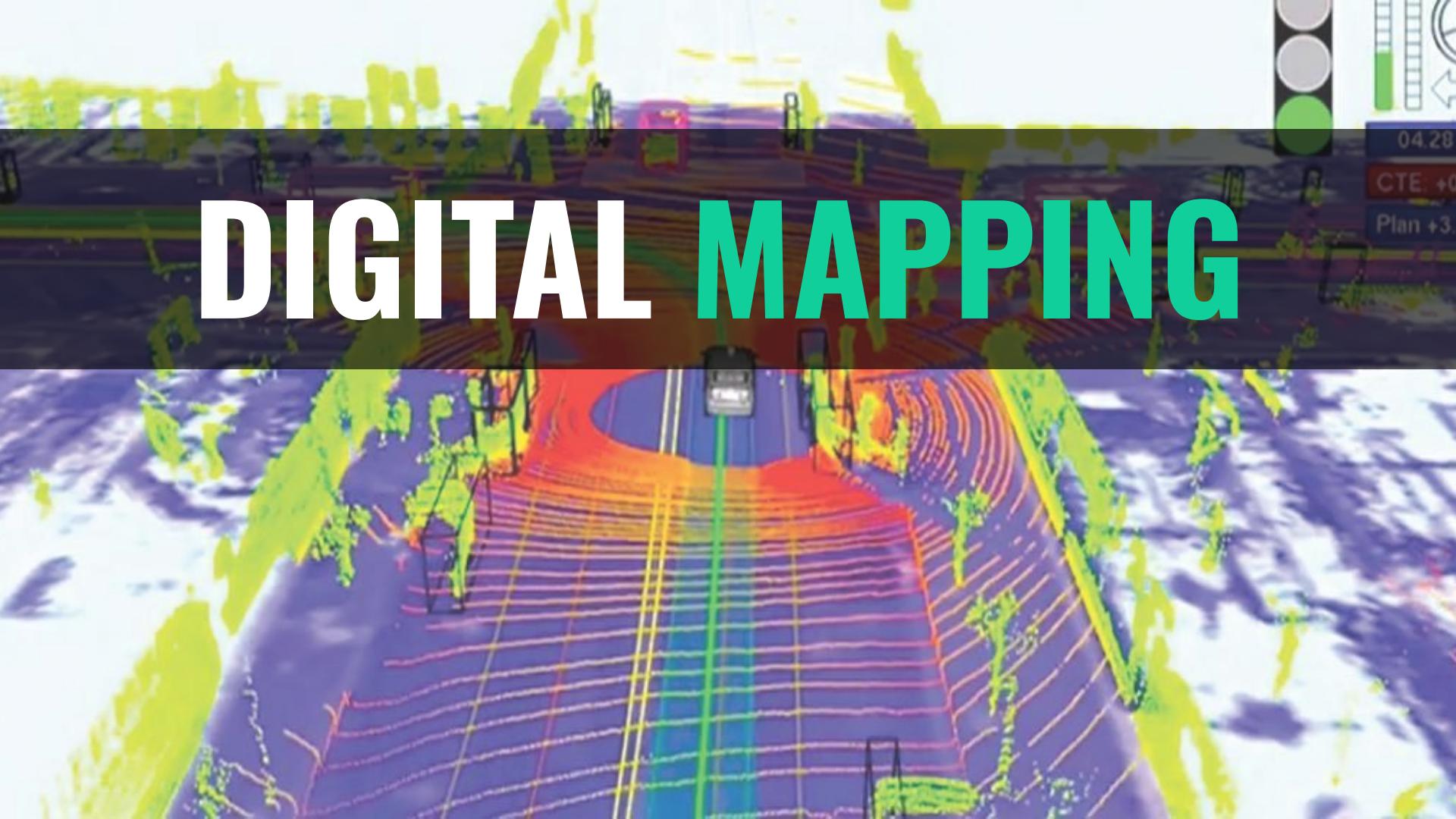
HOW IT WORKS



| 2013-02-21, 20:31



DIGITAL MAPPING

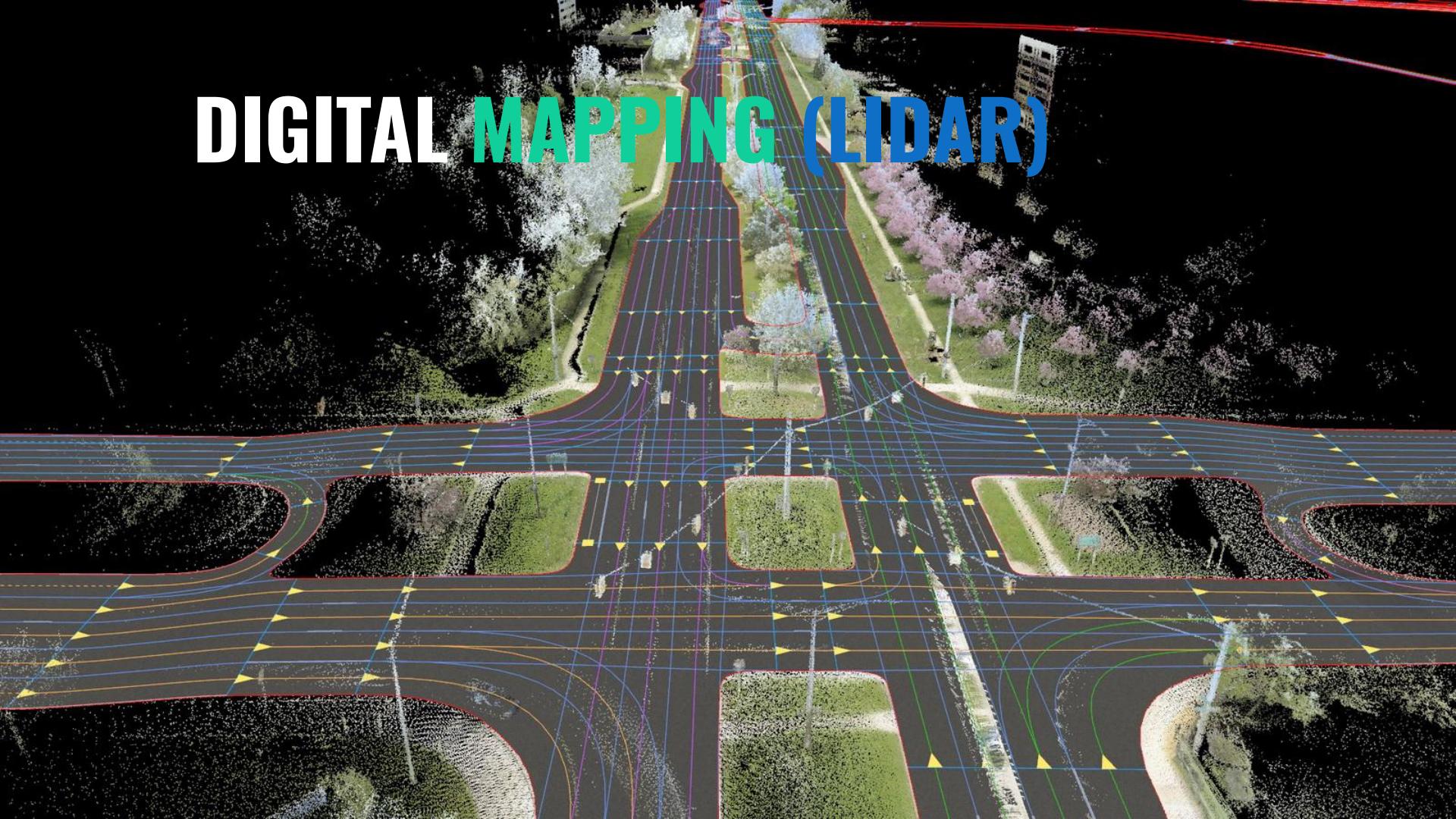


AUTONOMOUS TECH.

We are focusing on using a LiDAR as the main vision in this project. The Jaguar bot we are working on currently has only one functioning LiDAR.



DIGITAL MAPPING (LIDAR)

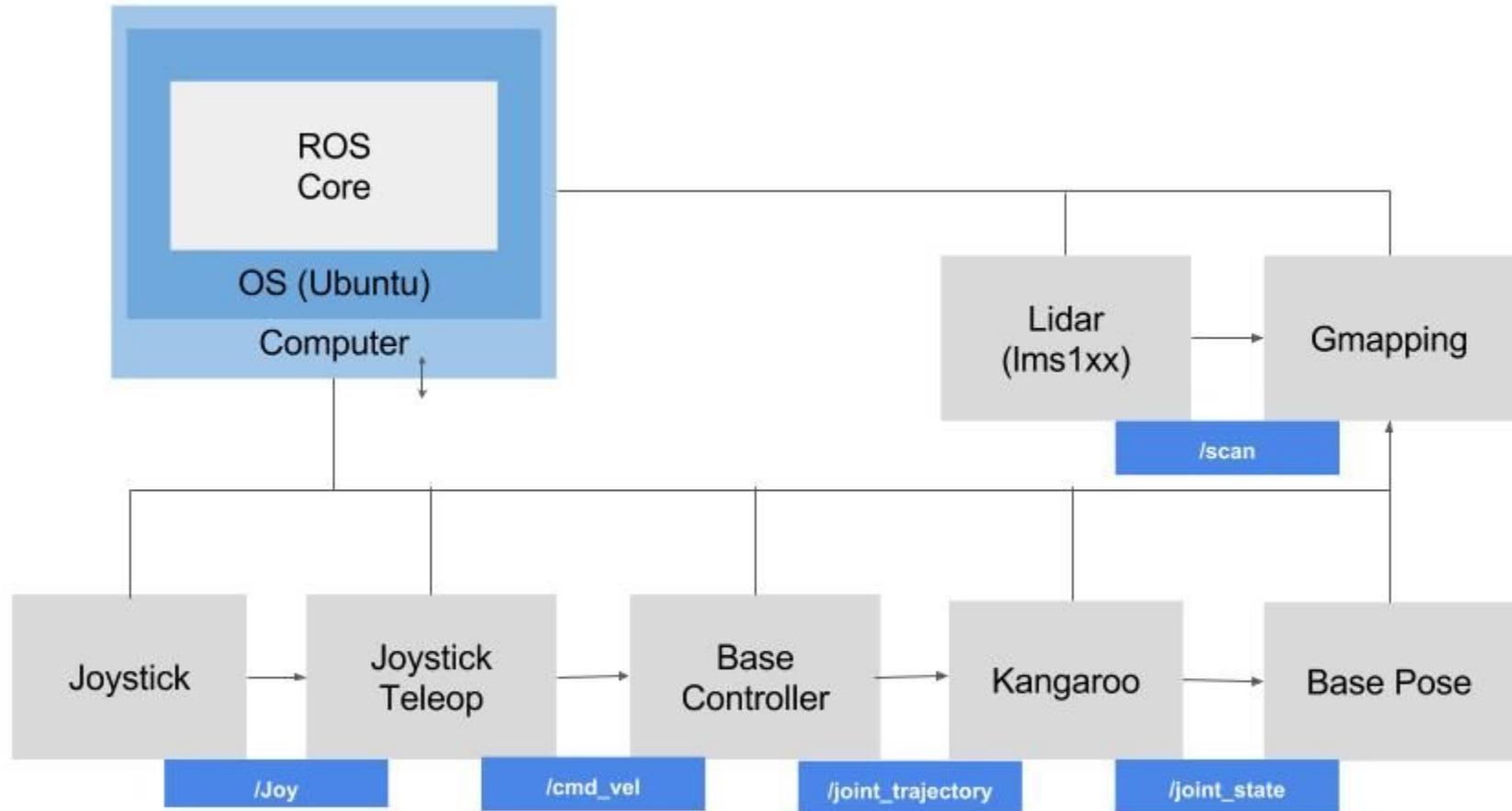


DIGITAL MAPPING (GETTING FEEDBACK)



Motion Control
system



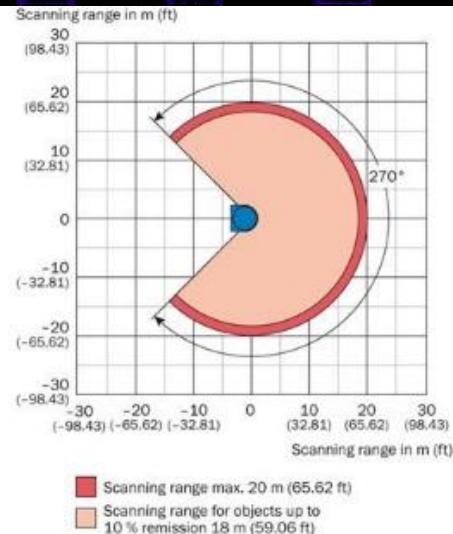
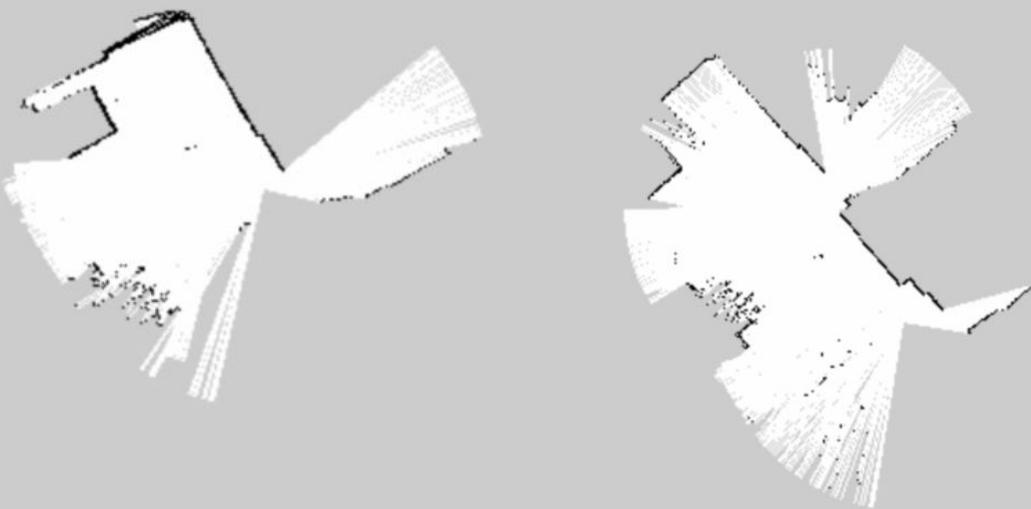


DIGITAL MAPPING



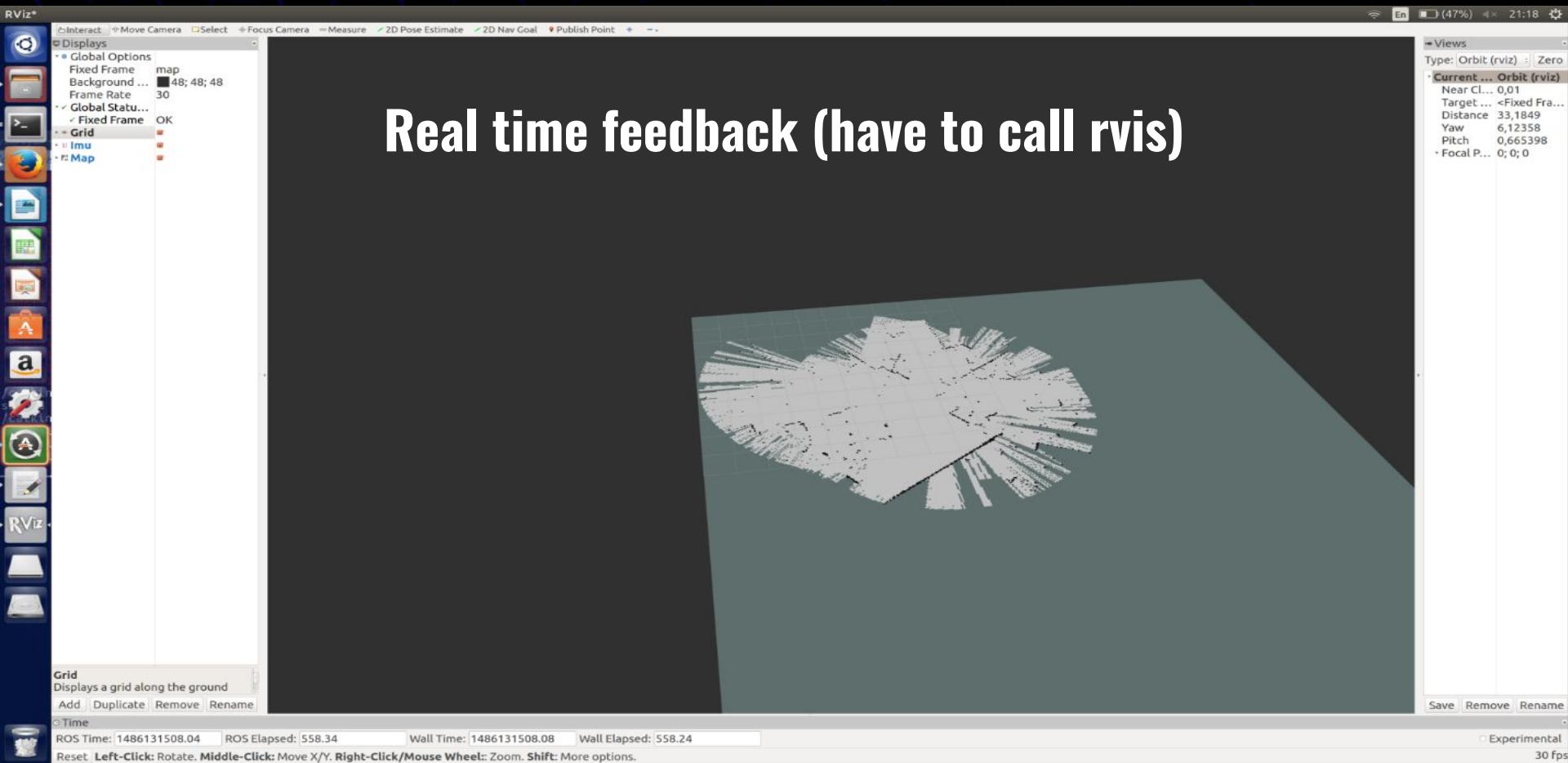
DIGITAL MAPPING

We tried mapping a small part of the AMS project room doing our best not to turn



DIGITAL MAPPING

Real time feedback (have to call rvis)



PERSONAL VIEWS ON AUTONOMOUS VEHICLES

- I. Our views on this project as a whole
- II. On autonomous vehicles (driverless cars)
- III. But there are many applications for this
not only on cars

REFLECTION ON THIS R&D PROJECT

FUTURE DEVELOPMENT

- I. Make the JaguarBot truly autonomous
- II. Implement this concept on other devices



CONCLUSION

- I. Real world experience**
- II. Test our limits**
- III. Broaden our view**
- IV. Greater achievements**

THANK YOU