Building a robot powered with Raspberry pi and Arduino from a super fast Traxxas RC car

Discover the OVCS (Open Vehicle Control System) project and the story behind this RC car's creation.

Spin42

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- Computer Sciences Master's Degree
- Fullstack Developer & System Administrator
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The OVCS Project

The Motivation

After years of building an Open Banking aggregator in Elixir, we explored a new challenge to test Elixir's potential for automotive applications.

The Vision

In 2024, we created the Open Vehicle Control System (OVCS) - an Elixir-based development kit for vehicle enhancements.

The Goal

OVCS empowers vehicle modernization, including electric vehicle conversion, infotainment enhancements, and advanced features like remote control, autonomous driving.

Scaled-Down Testing Environment

The OVCS project began with a 2007 VW Polo, but testing features like remote control and autonomous driving on a 1-ton vehicle on public roads was too risky.

We decided to switch to an RC car with similar components, providing a safer and more controlled environment for testing.

Building the Rocket RC Car

1

Choosing the RC car platform

Traxxas slash 4×4 VXL that can reach 100km/h

2

Designing the CAD files for 3D printing

Designing parts to allow the perfect fit of all the components

3

Manufacturing the required PCBs

Creation of Arduino and Raspberry hats, custom CANFD modules

4

Assembly, wiring, and integration

Make everything fit inside a VW cox body

Embedded components

Walksnail HD FPV (1 camera)

ExpressLRS radio receiver

IMU

2 cameras for stereoscopic vision

OVCS Vehicle management system

OVCS bridge for ROS2

OVCS bridge for MAVLINK

OVCS bridge for MSPOSD

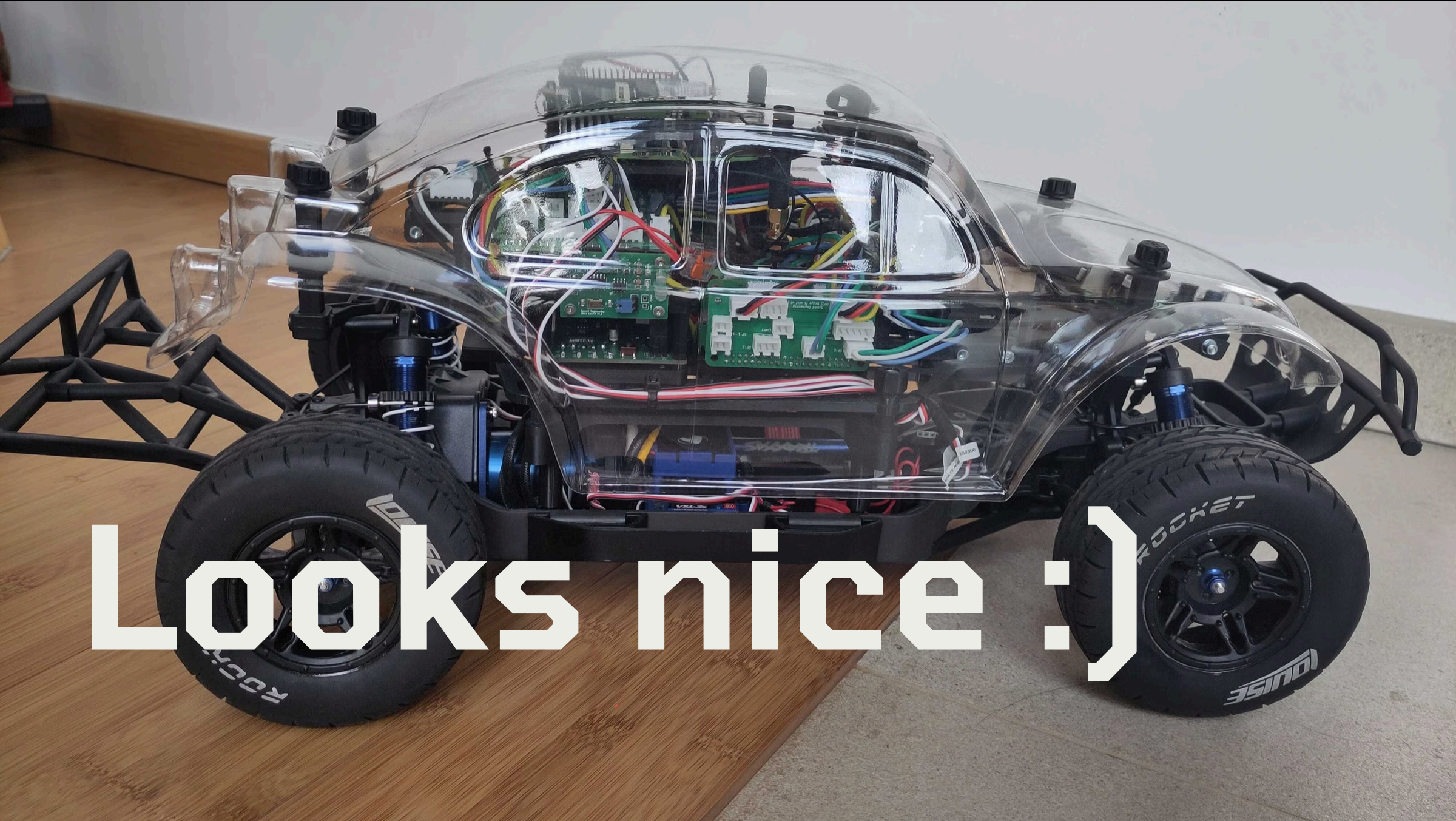
OVCS generic controller

OVCS Can 5V PSU

OVCS SPI CanFD controller

Ethernet switch + Wifi hotspot


No more space


Looks nice :)

Lessons Learned

1

Composable Code Architecture

Flexible code framework for vehicle platforms with unique configurations

2

Miniaturization Challenges

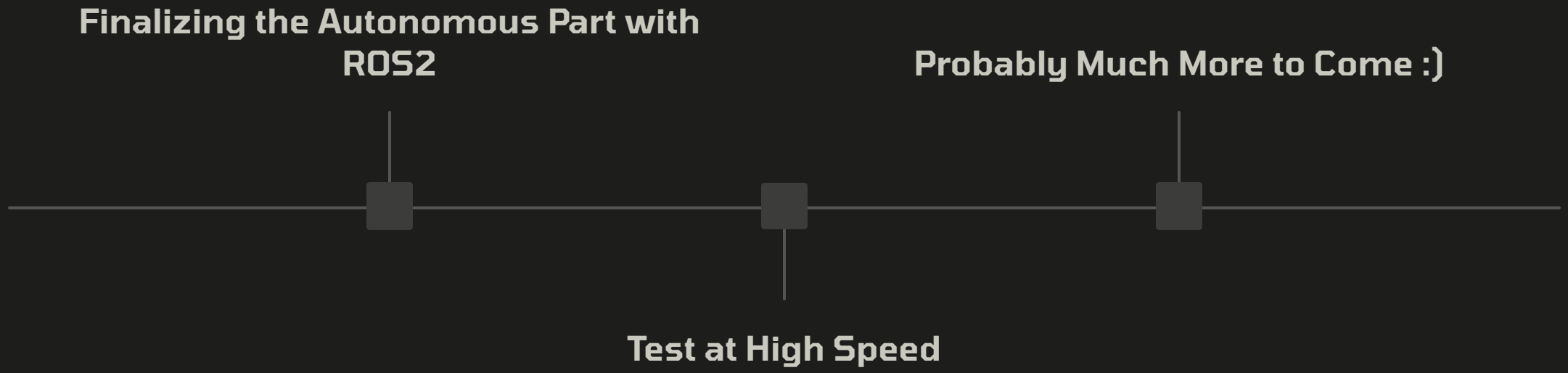
We wanted to use the same components as the VW to keep testing as close as possible. Scaling our automotive design to a 1/10 RC car chassis was not easy.

3

Keep it Clean

One of our core principles with this project is simplicity and accessibility.

What's next?


Finalizing the Autonomous Part with ROS2
Test at High Speed
Probably Much More to Come :)

Thank you for listening!

ovcs.be

Want more details? Check out the OVCS project today at 16:00 in K.1.1.105

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