Munich Voltage Vanguards

oneERNI

Global Hackathon

September 22-25 2023

Happy when we finished creating and assembling all the parts, …

… but that’s when the real work began – late afternoon 22.09.

Challenge accepted – to earn the most points in:

Usability

You might be good, but did you mind the users?

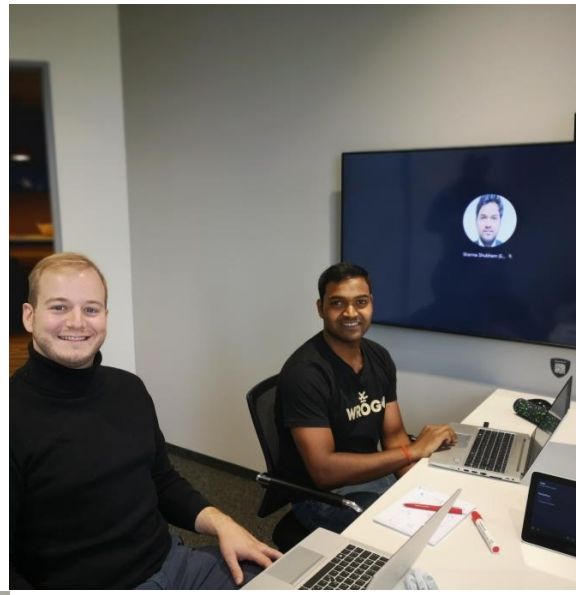
Technology

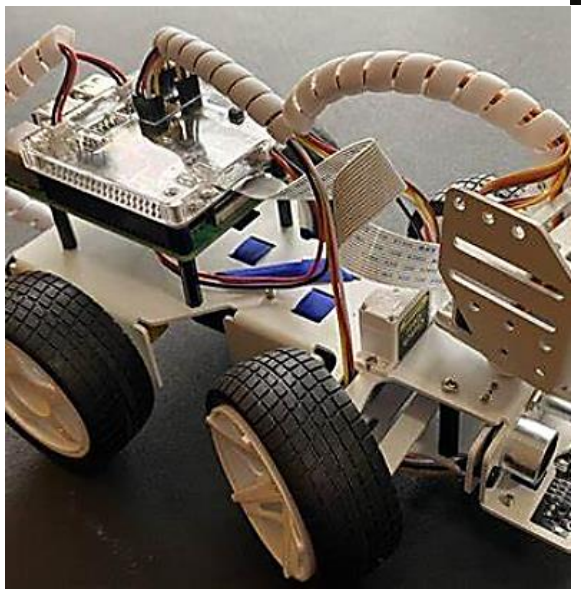
Tight timeframes are no excuse not to be excellent.

Beauty

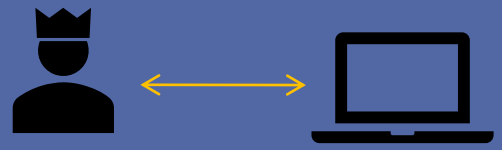
Can you win the hearts of the audience?

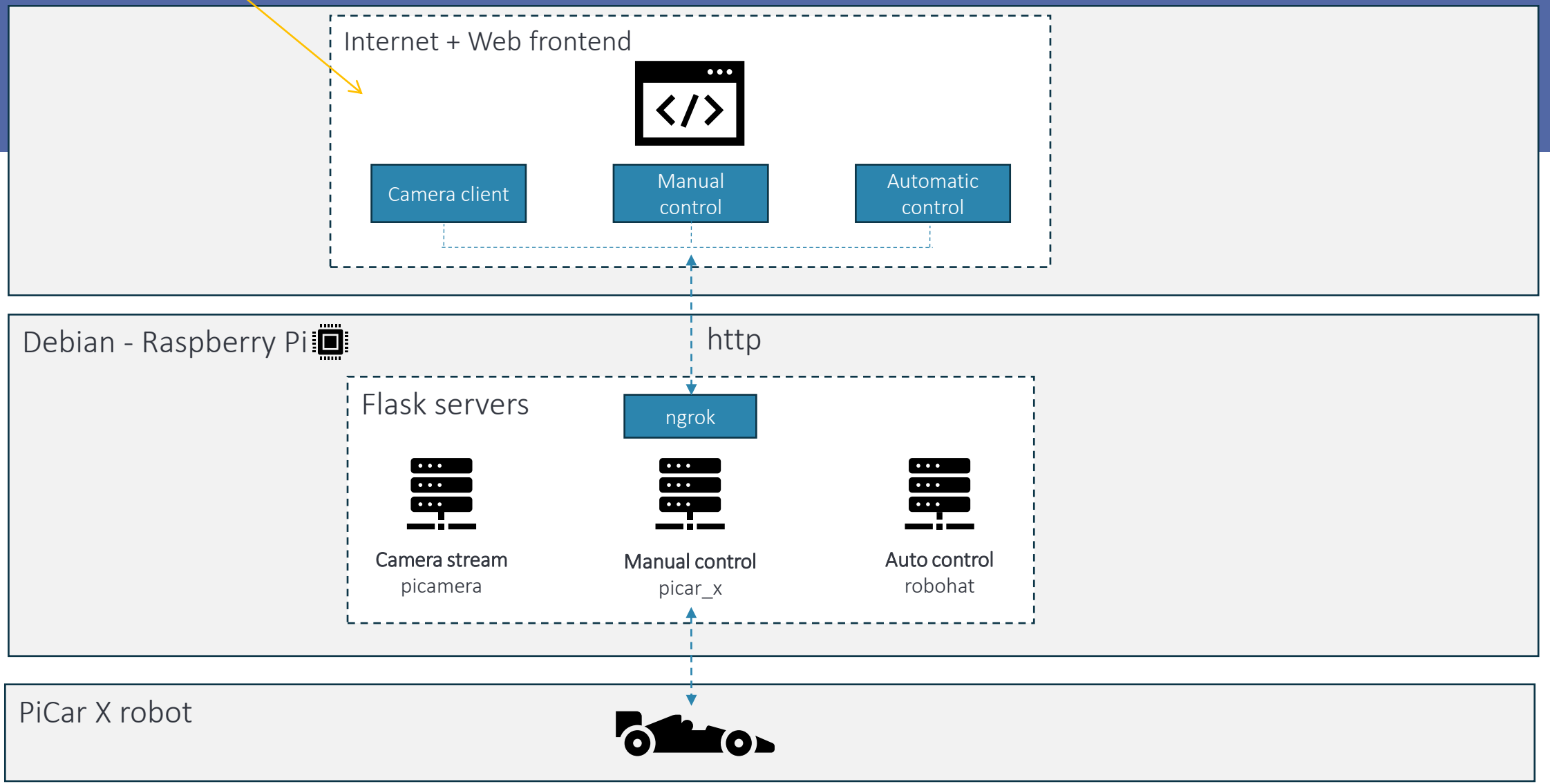
Our Vison:
build a self-driving PiCar





Architecture





Our Approaches to solve the challenge

- ❑ Do a line follower
- ❑ Do a camera-based navigation

Our Proposed Solution ?

- ❑ We control the robot with the controller dashboard
- ❑ We write the values in a log file
- ❑ We program a script to parse those log files and create an algorithm to repeat the track in log file

Results from these two approaches

Approach	Difficulty level	Time to complete
Camera based navigation	Medium	1 min, 10 seconds
Line Follower	Easy	1 min 20 seconds

Some Insights

list of commands , steer angle = -45 to - 48 degree with respect to gate 1

```
['FORWARD', 200, 4, 0],
```

- `['RIGHT', 200, 9, 1.638500576],`
- `['RIGHT', 200, 14, 2.0725836753845215],`
- `['RIGHT', 200, 19, 2.350529909133911],`
- `['FORWARD', 200, 4, 3.5228655338287354],`

Approach	Difficulty level	Time to complete
Memorization Technique	Extreme	17.35 seconds

Make it Lightweight, remove IR, Ultrasonic sensors etc

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Approach	Difficulty level	Time to complete
Memorization Technique	Extreme	16.55 seconds

Make it Lightweight, remove IR, Ultrasonic sensors etc

Results from the late afternoon 23.09.2023:

Autonomous run („level 1“)

- First steps along the line
- The little car had a lot to learn

Video Link is in video_link.txt file in repo root folder

Autonomous run („level 5“)

- Fastest run: **17:35 seconds**
- Based on data collected during manual runs it is the foundation for our fastest autonomous run

Learnings:

- ✓ We can get really hungry during late nights too
- ✓ The office main entrance locks after 8pm , so use keys and backdoor entrance
- ✓ Collecting used bottles can be useful to create gates for Hackathons