Robot Operating System
Summer School 2019

ROSin

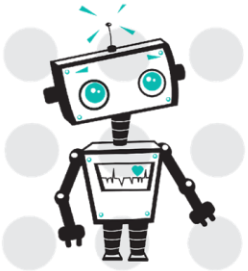
H2020 funded
GA no. 732287

FH AACHEN
UNIVERSITY OF APPLIED SCIENCES

Day 9 and 10
Challenge

8th ROS Summer School in Aachen

ROS.org



MASCOR
Mobile Autonomous Systems
and Cognitive Robotics

FH AACHEN
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ROS Challenge and Exam Days
Day 9 and 10

ROS Summer School 2019 Final Challenge

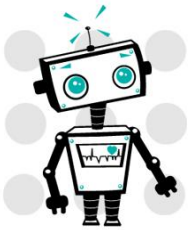
> Exam
> Free Hacking
> Final Challenge

22.08.2019	9th Day:	Exam / Free Hacking
10:00 – 11:30	ROS Summer School Exam	
08:00 – 13:00	Free Hacking	
13:00 – 14:00	Lunch at Mensa	
14:00 – 23:59	Free Hacking	

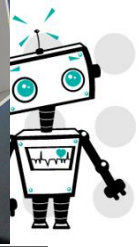
D101 Seminar

D110 Tutorial

23.08.2019	10th Day:	Final Challenge
08:00 – 10:30	Last chance…	
10:30 – 12:00	Final Challenge	
12:30	Group photo in front of the building! Take your robot with you ☺	
12:45 – 13:30	Feedback, Certificates and Transcripts	
14:00 – 16:30	Good Bye BBQ!	



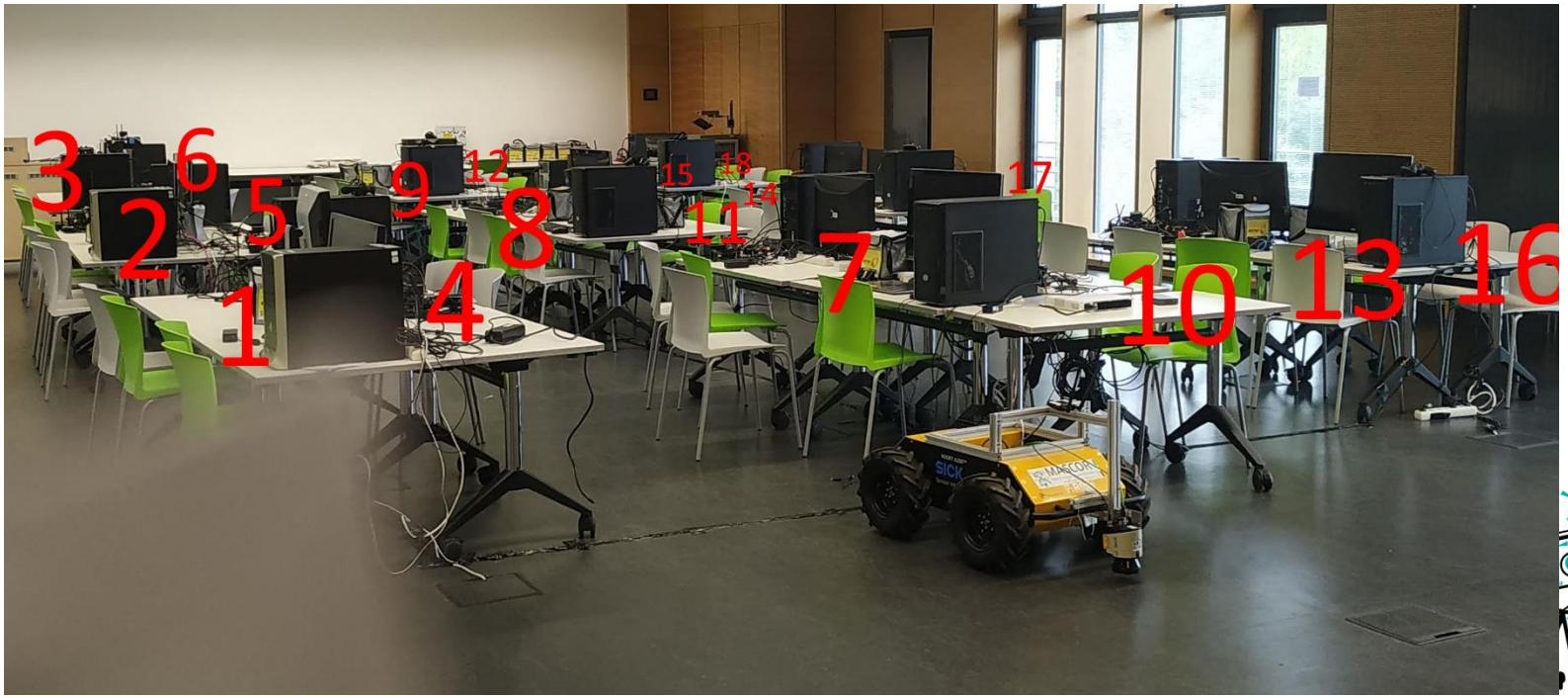
ROS Summer School 2019 Final Challenge: Pizza delivery bot



ROS Final Challenge Groups

2 Towns – 18 Groups – Tons of Pizza – One Goal!

- Feel free to build new groups for the challenge
- We will team you up by the tables



ROS Final Challenge Qualification

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Preliminary round

Time	Town A	Town B
10:30	Group 1	Group 2
10:34	Group 4	Group 5
10:38	Group 7	Group 8
10:42	Group 10	Group 11
10:46	Group 13	Group 14
10:50	Group 16	Group 17
10:54	Group 3	Group 1
10:58	Group 6	Group 4
11:42	Group 9	Group 7
11:46	Group 12	Group 10
11:50	Group 15	Group 13
11:54	Group 18	Group 16
11:58	Group 2	Group 3
12:02	Group 5	Group 6
12:06	Group 8	Group 9
12:10	Group 11	Group 12
12:14	Group 14	Group 15
12:18	Group 17	Group 18

Quarter Final

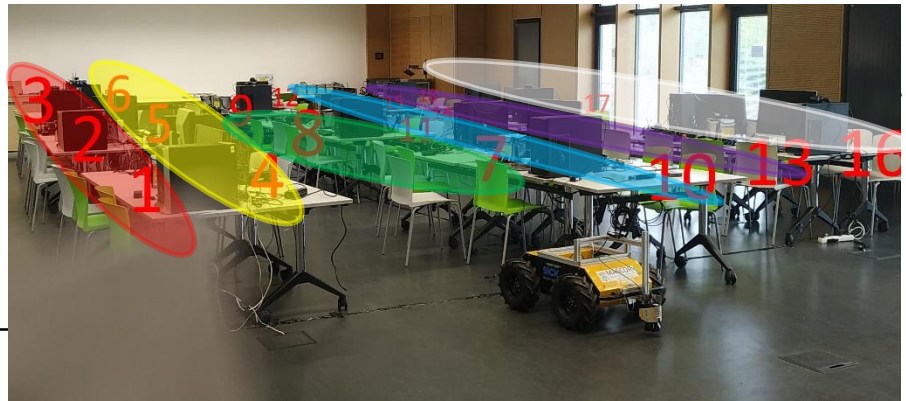
Time	Town A	Town B
12:22	Winner	Winner
12:26	Winner	Winner
12:30	Winner	Winner

Third Place

Time	Town A	Town B
12:22	Winner	Winner
12:26	Winner	Winner
12:30	Winner	Winner

Final

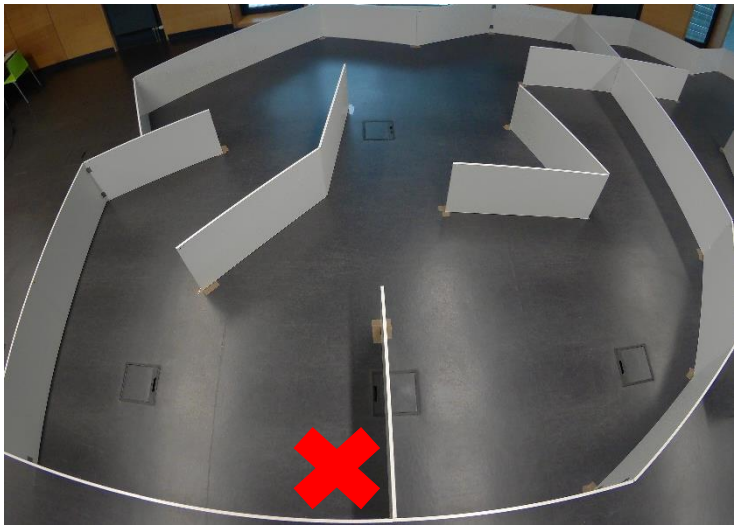
Time	Town A	Town B
12:34	Winner	Winner



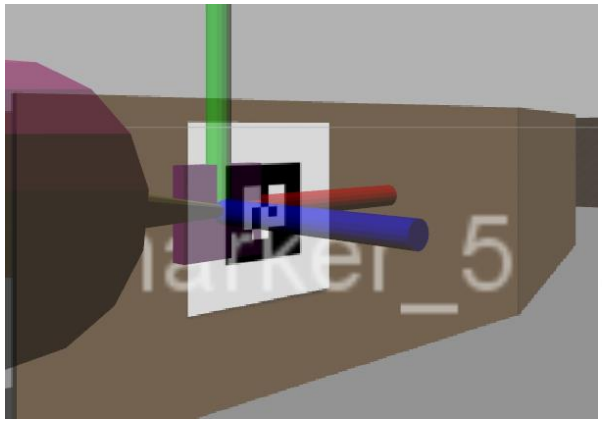
ROS Final Challenge Task

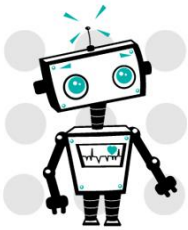
Final Challenge Description

- Town A and Town B both claim to have the fastest pizza delivery
- Goal: Deliver as many pizzas in time as possible
- Delivery points are AR Markers
- Time limit is 3 minutes!
- 1 minute preparation time!
- K.O. System
  - Best run out of both counts in Prelimenary Round & Third Place
  - Only ONE run for Quarters and Finals!



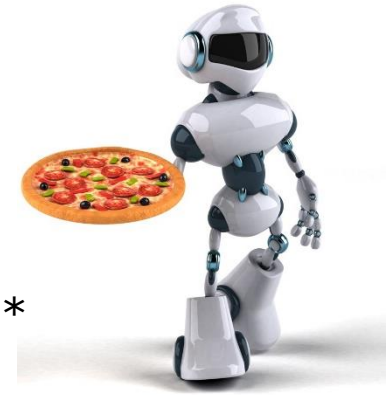
Start Point





ROS Final Challenge Task

Final Challenge Rules

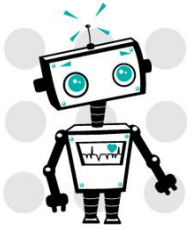


- Everyone will start with 0 points!
- Your pizzeria will send you next goal position. *
- Delivering one pizza to the correct destination is +1 point. **
- AFTER delivering the pizza, your pizzeria will send you the next goal position *
- After every 3rd delivered pizza you can warm up the next pizzas at the Pizzeria. This will give +2 points! ***

* Being published on the Topic /next_goal from Type std_msg/Int16
git clone https://gitlab.com/ros_school/challenge

** The actual marker ID will be subscribed from /ar_pose_marker[0]/id from message type ar_track_alvar_msg/AlvarMarkers

*** The robot position will be detected by a listener from /base_link to /map frame

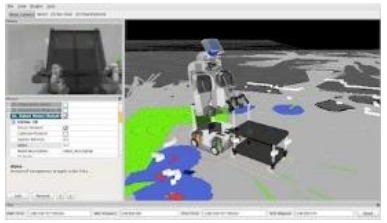


ROS Final Challenge Task

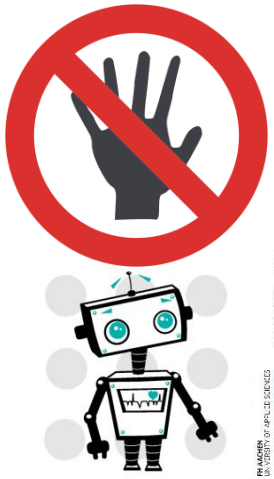
We honor autonomy!

- Complete teleoperation is allowed!

- Using rviz for goal points will double your total score x2!



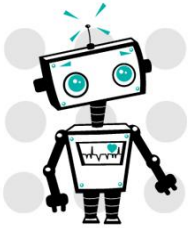
- Doing a complete autonomous approach without any human interaction after start will quadruple your score x4!!!



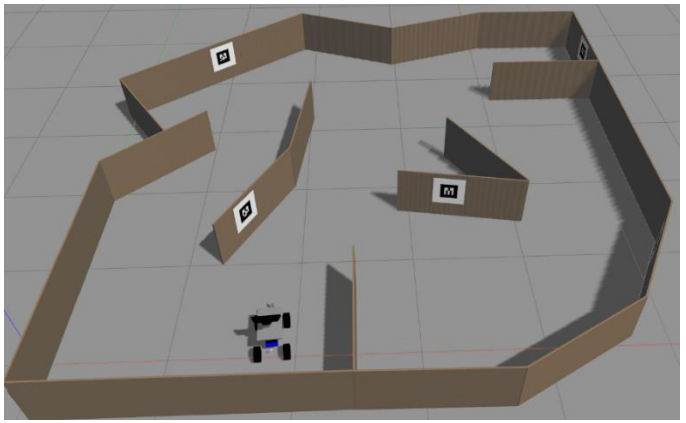
ROS Final Challenge Task

Does and Dont's

- It is allowed to create the map before the Challenge!
- It is not allowed to damage the track! You will get -3 points for that!
- Hitting a wall is ok, but will waste your time…
- You do need to have fun!
- Any questions for the rules? We will discuss it and add a FAQ ☺

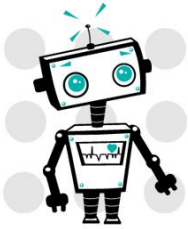


ROS Final Challenge Task



Final Challenge Hints

- Use Gazebo for testing approaches!
- Use rafcon for task organization.
- Share the work in your team.
- Two teams will always compete at the same time!!
- One team member should use Gazebo to start developing a strategy
- Another team member should map both (!) arenas (Town A AND Town B), get and note your points of interest and create launch files to simplify your startups

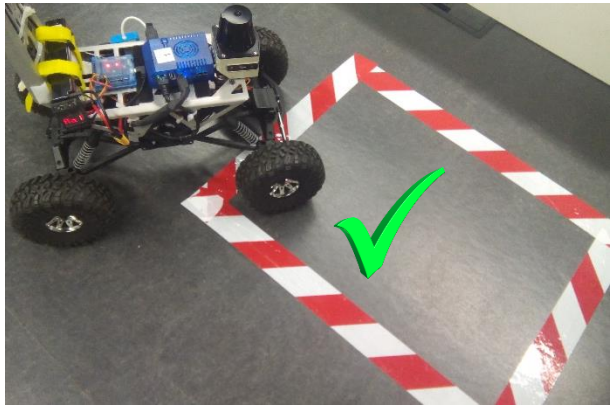


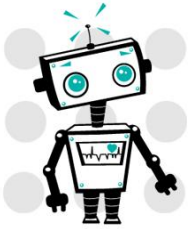
ROS Final Challenge Task

Final Challenge FAQs

- Q: Do we have to build a map during our competition time?
- A: No! You can build one a priori. The arena dimensions will not change!

- Q: Will the positions of the markers in the arena change?
- A: No! They will stay the same!



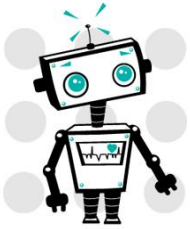


ROS Final Challenge Task

Final Challenge FAQs

- Q: When exactly will the time stop?
- A: 3 minutes after a start signal!

- Q: When am I back to the initial position “Pizzeria”?
- A: At least one part of your robot has to go over the rectangular starting box. The orientation doesn’t matter.



ROS Final Challenge Hints

- Take care about the limited data stream over WiFi
  - Reduce the fps of the webcam! (Recommended 5 fps)
  - Don’t stream RAW images over WiFi! Use compressed instead.