



HOCHSCHULE  
RAVENSBURG-WEINGARTEN  
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# SOFTWARE DEVELOPMENT FOR AUTONOMOUS MOBILE ROBOTS

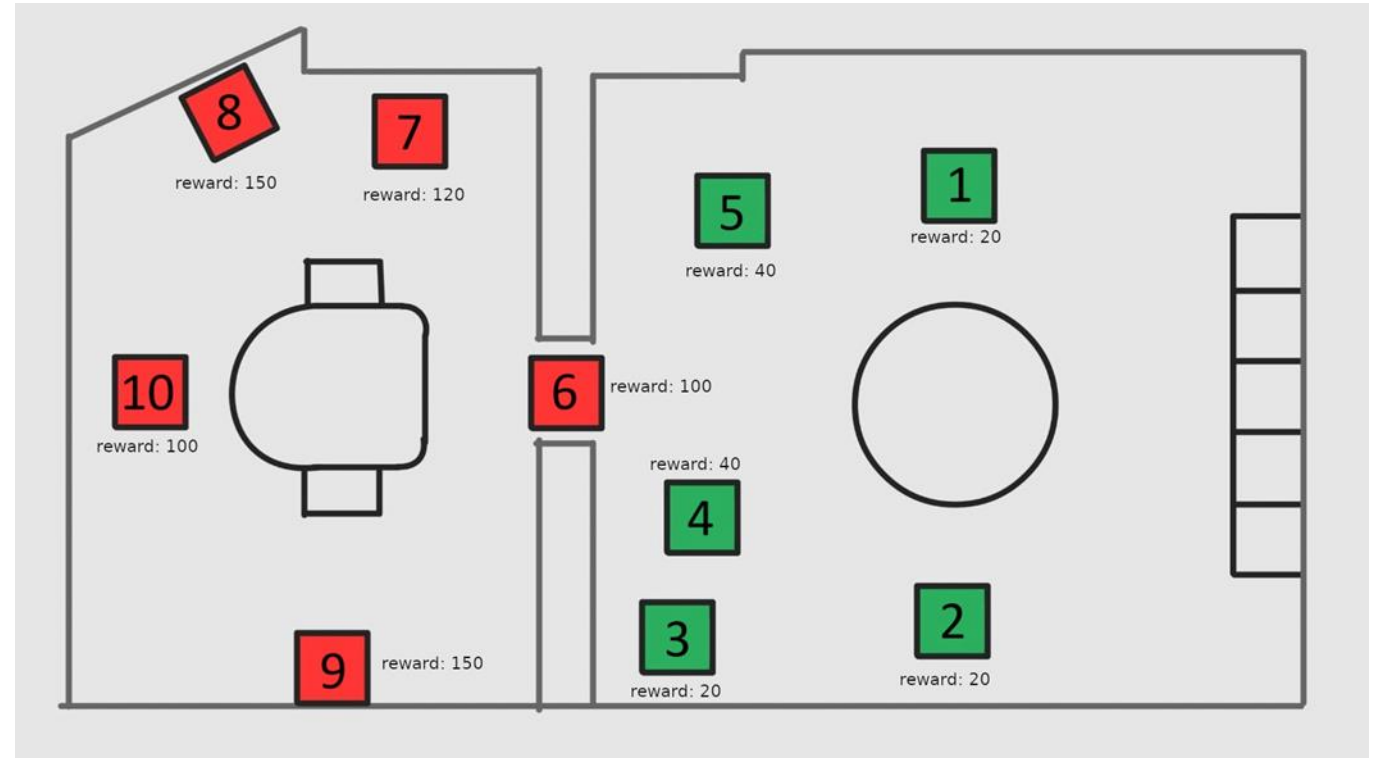
## FINAL PRESENTATION

## Arena – General Strategy

- We had the idea to **sort** the robot goals **by rewards** and go through them, but we analyzed that it becomes too dangerous at goal 6 when many robots are on the move and want to get through.

Change of Plans:

- Start with the easy zone first, move on to the hard zone second and complete with only one zone change



# Planned Strategy for Zone Change

- My Partner already explained the zone change in detail.
- I want to explain more about how we **drive from one goal to the next** goal, and what happens if the goal is **blocked** from another Robot.
- **Strategy?**
- **Problems?**

# Planned Strategy for Driving

- The goals are saved in a json file, and marked if it is in the easy or hard zone
- Algorithm that calculates the nearest goal, to reach goals faster
- Dynamic adjustment of goal order based on current position
- Time limit of 30 seconds to drive to the goal
- If the goal is not reached in time, the program calculates the next nearest goal
- The robot must complete first the easy zone, and after that it continues to the hard zone

# Problems

- **Problem:** Deadlock when a goal is blocked and not reached in 30 seconds, because the nearest goal is the same, **the robot tries to go to the same goal again!**
- **Solution:** Implementation of a **cool-down phase** to resolve blockages. The unreachable goal goes in a second list (“attempted goals”) and after a cool-down phase the goal comes back in the goal list.
- **Problem:** Deadlock when last goal is blocked, because there is no where else to go for the robot. And it will most likely block the other robot to come out of the goal.
- **Solution:** Detection of deadlocks, if it is not reached in time, the robot will move backwards/turning and sleep a little time to not block another robot and it will let the robot out.



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# Thanks for your Attention!

