HOCHSCHULE
HAMM-LIPPSTADT

# ELE Prototyping SoSe 2021

Programming – Task 3

If you have any questions during the week, send an email to

kristian.rother@hshl.de

# ELE Prototyping Programming Task 3 - Overview

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- Deadline: **17th of June 2021, 15:00h**
  - Send your files **via email** to kristian.rother@hshl.de (subject: ELE Prototyping Task 2)
  - **AND uploaded the files to your GitHub account**
- **Presentation of results: 18th of June 2021 (WebEx, see schedule)**
- **Code in C** (not C++)
- Feel free to use any programming environment you like. If you're unsure, you can use Visual Studio Code
  - https://code.visualstudio.com/
  - Install the extension for C/C++
  - Optionally install the Code Runner extension
  - Install/setup the compiler for your platform
  - Windows: https://www.javatpoint.com/how-to-run-a-c-program-in-visual-studio-code
  - Mac: https://code.visualstudio.com/docs/cpp/config-clang-mac

# ELE Prototyping Programming
# Task 3 – Description 1/3

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- The world that your robot navigates in gets a little more complex in this task. In addition to the things from the previous task it can now
  - Contain **obstacles (‘*’) inside the map**
  - For now, they behave just like walls
- The robot will also **use energy**
  - 10 energy per movement
  - 30 energy per toggle of the driving mode
  - For now, energy is only counted. Try to use as little energy as possible

# ELE Prototyping Programming
# Task 3 – Description 2/3

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- To complete the map, the robot has to **return the target to the home base**
  - The home base is the starting spot of the robot
  - It is indicated by an ‘X’ after the robot leaves the spot
  - Your goal is to navigate to the target (‘T’) and after that, return to the ‘X’ spot.
  - Targets are always considered to be on land for now so after you leave the ‘T’ spot, it will become an ‘O’ spot
  - There will be exactly one target and one home base on each map

# ELE Prototyping Programming
# Task 3 – Description 3/3

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- We have provided some maps to test your robot. For example, to change from map 1 to map 2, change *memcpy(world, world1, sizeof(world1));* to *memcpy(world, world2, sizeof(world2));*
- Your task is to write a robot, that can handle the new requirements
- **Do not change the function signature of move**
- **All your code should be written in *robot_teamname.c* and *robot_teamname.h*. Do not change anything else.**

# ELE Prototyping Programming
# Task 3 – Your Task

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- **Send** your final robot_teamname.c file and robot_teamname.h file to kristian.rother@hshl.de **via email AND upload the code to your GitHub** before the deadline
- **Prepare a presentation for Friday** to explain your code
- Important note: I will test your robot in my test environment. The environment contains different maps, not just the ones provided to you. **Do not hard code a solution**. The robot should handle different maps
- The maps can now contain
  - One Robot (‘R’), one target (‘T’) and one home base (‘X’) after the first step
  - Outside walls (‘#’) and inside walls (‘#’)
  - Water (‘~’)
  - Obstacles (‘*’)