

Exercise: Braitenberg vehicles

1. Braitenberg vehicles

First read and understand what *Braitenberg vehicles* are. Which different types of Braitenberg vehicles are there? In the exercise you should be able to draw some of them on the blackboard.

2. A simple robot simulator

Then write a simple 2D robot simulator (in C++, Python or whatever programming language you prefer) in which you implement a robot which has the form of a circle. In a 2D world each cell (pixel) shall be either an obstacle or a free cell. Give the robot at least two distance sensors which allow it to measure the distance to the nearest obstacle cell in the world in each of the sensor ray directions.

3. Exploration with obstacle avoidance

Then implement a simple “wander around” behavior for this robot where the robot randomly explores the world and is able to avoid obstacles. Try to implement the obstacle avoidance behavior in as few lines of code as possible! Also implement one of the Braitenberg vehicle types in your simulator.