Project plan

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Description of adopted solution

- Robot design: Typical two-wheel robot with a motor attached to each wheel with a third supporting wheel in the back of the robot. Four ultrasonic sound sensors are attached at a tower with 90° between them. The tower is able to rotate about 360° from the center point, so it can rotate 720° from one turning point to the other.

- Program on the brick: On the brick we have a program with two threads running simultaneously. The reason for this is that waiting for bluetooth data blocks a thread completely, and we want to maximize sensor readings. One of the threads contains a while-loop which does the following things in chronological order: First, it activates a seconds thread by setting a boolean variable to true. Then, it loops through the following three times: update position and collect data from all four sensors. After this, it checks if the seconds thread has finished running. If it has, the brick will send three packets of data containing position, current heading and the four sensor-readings to the PC. The other thread consists of an infinite loop which waits for a bool to become true, and when that happens it starts a bluetooth connection to the PC and starts to wait for the PC to send new steering commands.

- Program on the PC: On the PC there is a single while-loop which controls everything. First, it sends the newest steering commands to the brick. Secondly, it wait for the brick to send sensor data. When the data is received, the map is updated with the sensor data and the map is shown on the computer screen. Lastly, the Nearness Diagram function (or possibly another one of the three methods for collision avoidance we talked about in the presentation) is called and the loop starts over again.

Completed tasks

Most of the discussion and implementation has been done together, but for the following list the person in brackets has had the main responsibility of finishing that part.
• Test different sensors and decide which one to use (Sofia)
• Robot construction (Per)
• Implementation of Nearness Diagram algorithm (Felix)
• Mapping implementation (Sofia)
• Odometry positioning algorithm (Per)
• Bluetooth data transfer between PC and brick (Sofia)

**Intended work**

Deadline December 11:

• Design an environment for performance tests
• Compare performance to our naive algorithm
• Possibly implementing another state-of-the-art method
• Make everything work together without (major) bugs

Deadline December 20:

• Record runs for the final presentation
• Record a final presentation
• Write the report