

RoboCode Tutorial

Introduction

This introduction will guide you through the basics of robocode, the orientation of the battlefield, the physics used in the game and some basic movement, radar and firing strategies.

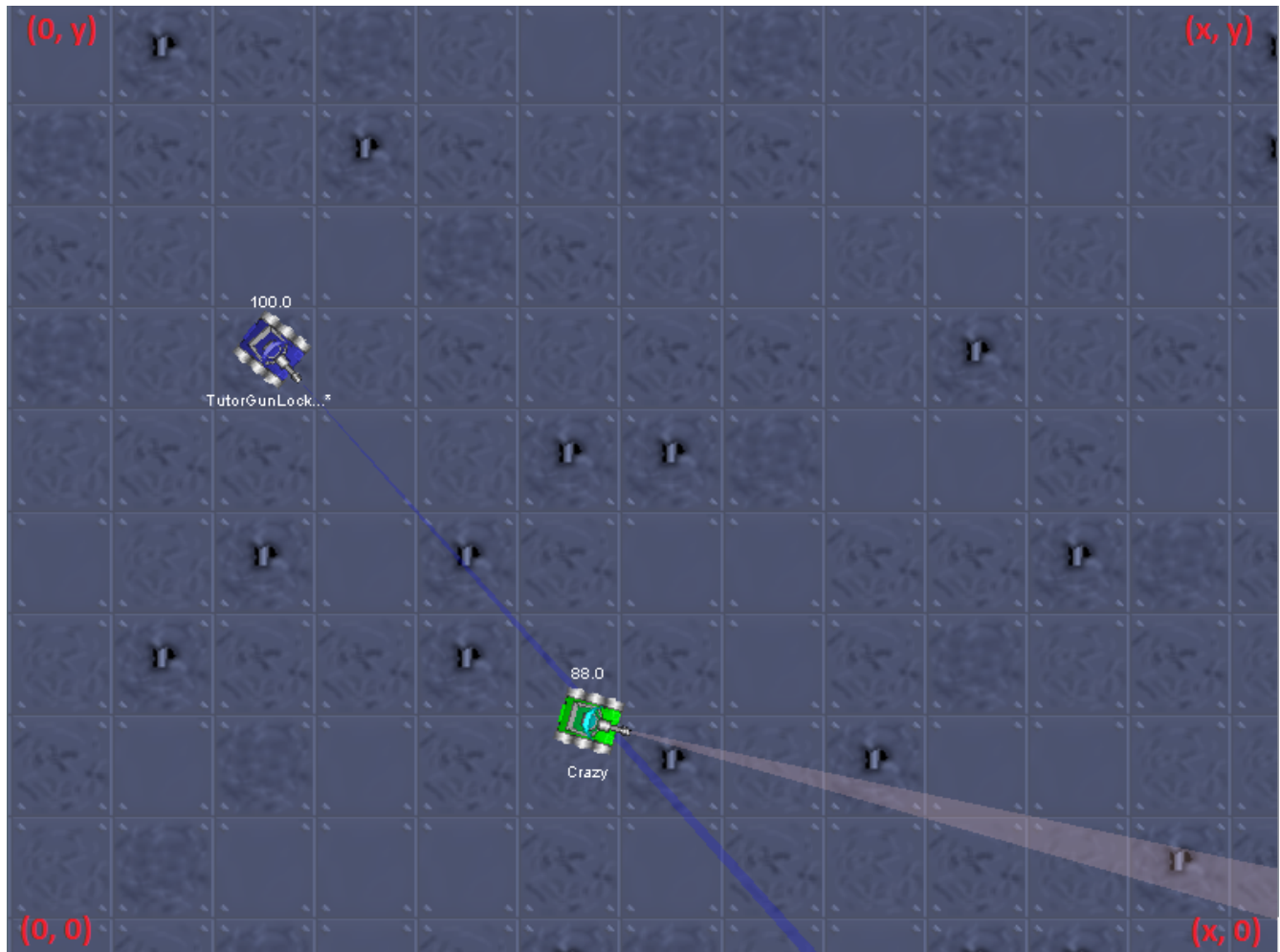
Orientation

There are 3 important points of orientation in the game:

- The battlefield
- The heading of your tank with regard to the battlefield
- Your bearing with regard to other objects

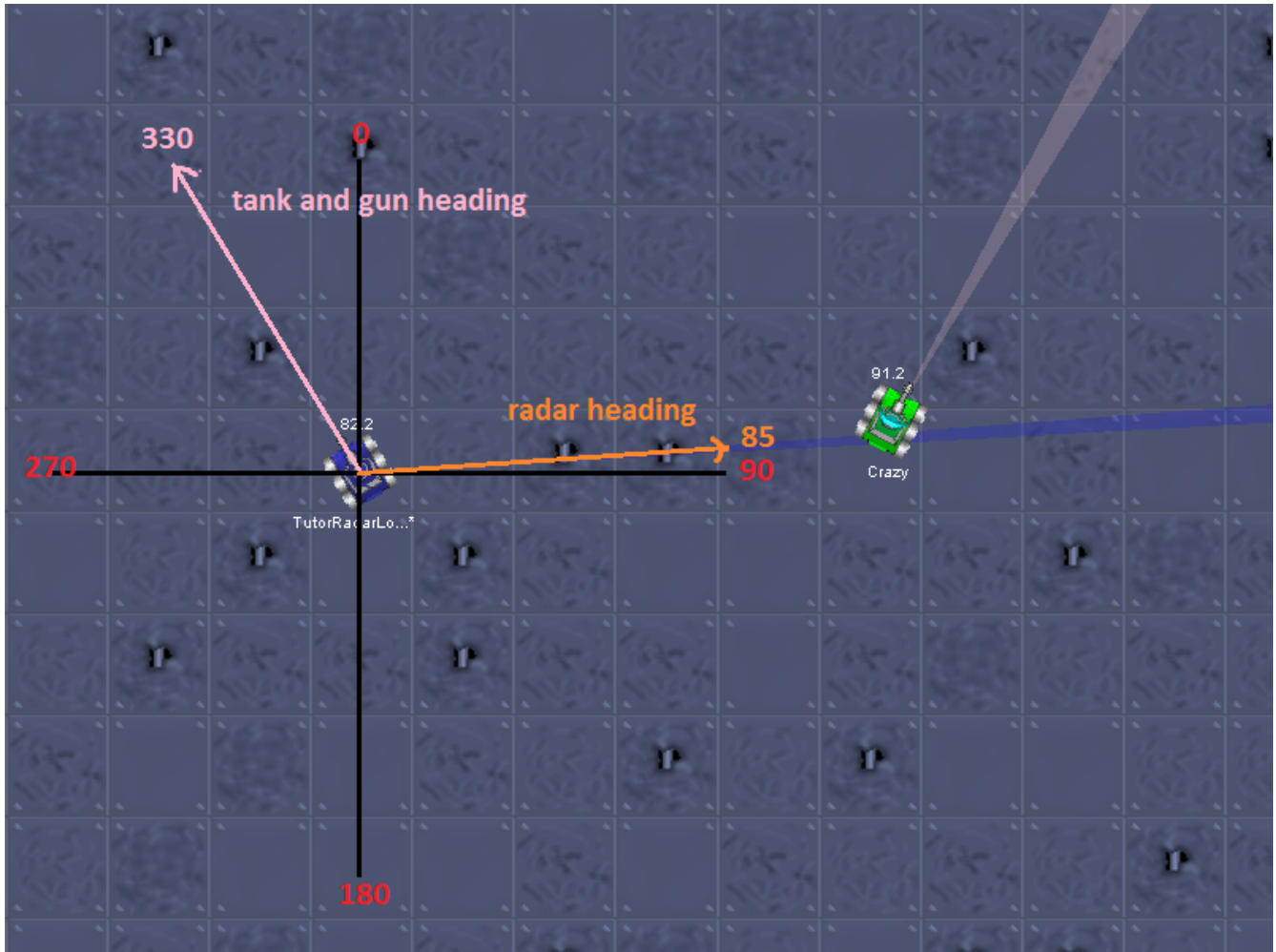
Battlefield

The battlefield is laid out in a cartesian plane with the origin in the lower-left corner.



Heading

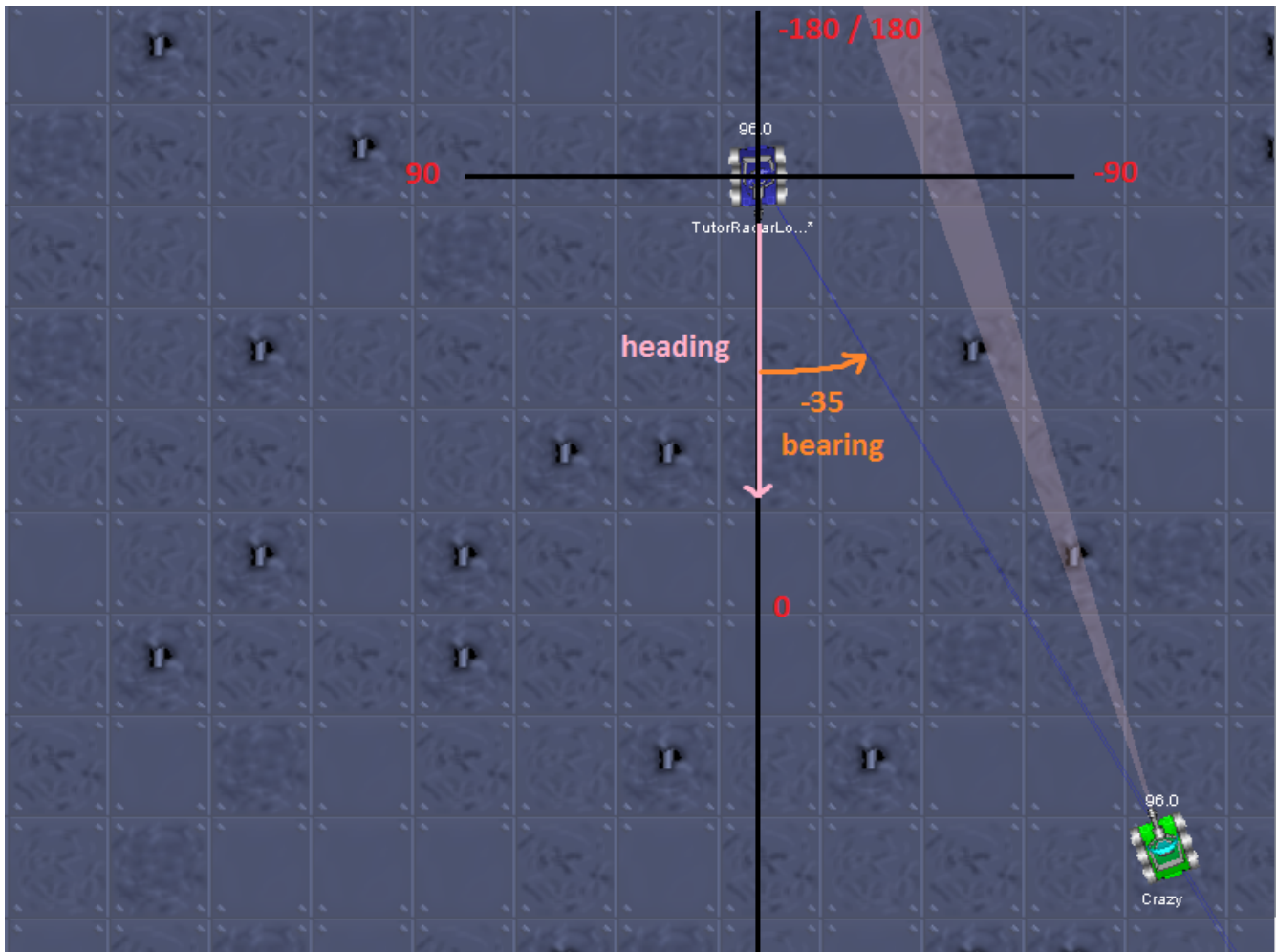
Which way your robot is facing is called the **heading**. The heading is measured in degrees where 0 degrees means facing up, 90 degrees facing right and so on clockwise until we reach 360.



Note that because the vehicle, the gun and the radar can all move independently, they each have their own heading.

Bearing

Besides your own position, you should be interested in the position of other objects (enemies, walls) in the battlefield as well. The position of your tank's heading relative to other objects is called the **bearing**. It is measured in normalized degrees, which means its possible values range from -180 to 180. Objects to your right will always have a positive bearing, objects to your left a negative one. This even holds if you're tank is facing downwards as the picture shows.



Movement

Unless you want to be a sitting duck, you should probably move around, if only to dodge the occasional bullet. With movement you can take two approaches. You either take a proactive stance or a reactive one. The first means you actively move across the battlefield while the latter means you only move to dodge a bullet or an enemy. You can move by calling the **ahead()** method.

Assignments

1. turn your tank towards sitting duck and ram him
2. build a robot that follows the wall (hint: use the **onHitWall()** event)

Scanning

To kill your enemies you will have to find them first. This is where your radar comes in. Your robot knows when it's seen another robot, but only if it scans it. On a scan the **onScannedRobot ()** method is called. Scan events are arguably the most important of all events. Scan events give you information about the other robots on the battlefield (Some robots put 90+% of their code in the **onScannedRobot ()** method.). The only way scan events can be generated (practically speaking) is if you move your radar. (If an enemy robot wanders in front of your radar it will generate a scan event, but you should really take a more proactive stance.)

Assignments

1. keep your radar locked on Crazy (hint: the bearing of the enemies scanned by your radar are relative to your tank's heading)

Firing

Another important aspect of firing is calculating the firepower of your bullet. The documentation for the **fire()** method explains that you can fire a bullet in the range of 0.1 to 3.0. The weaker the bullet the faster it is and vice versa. So it's probably a good idea to fire low-strength bullets when your enemy is far away, and high-strength bullets when he's close.

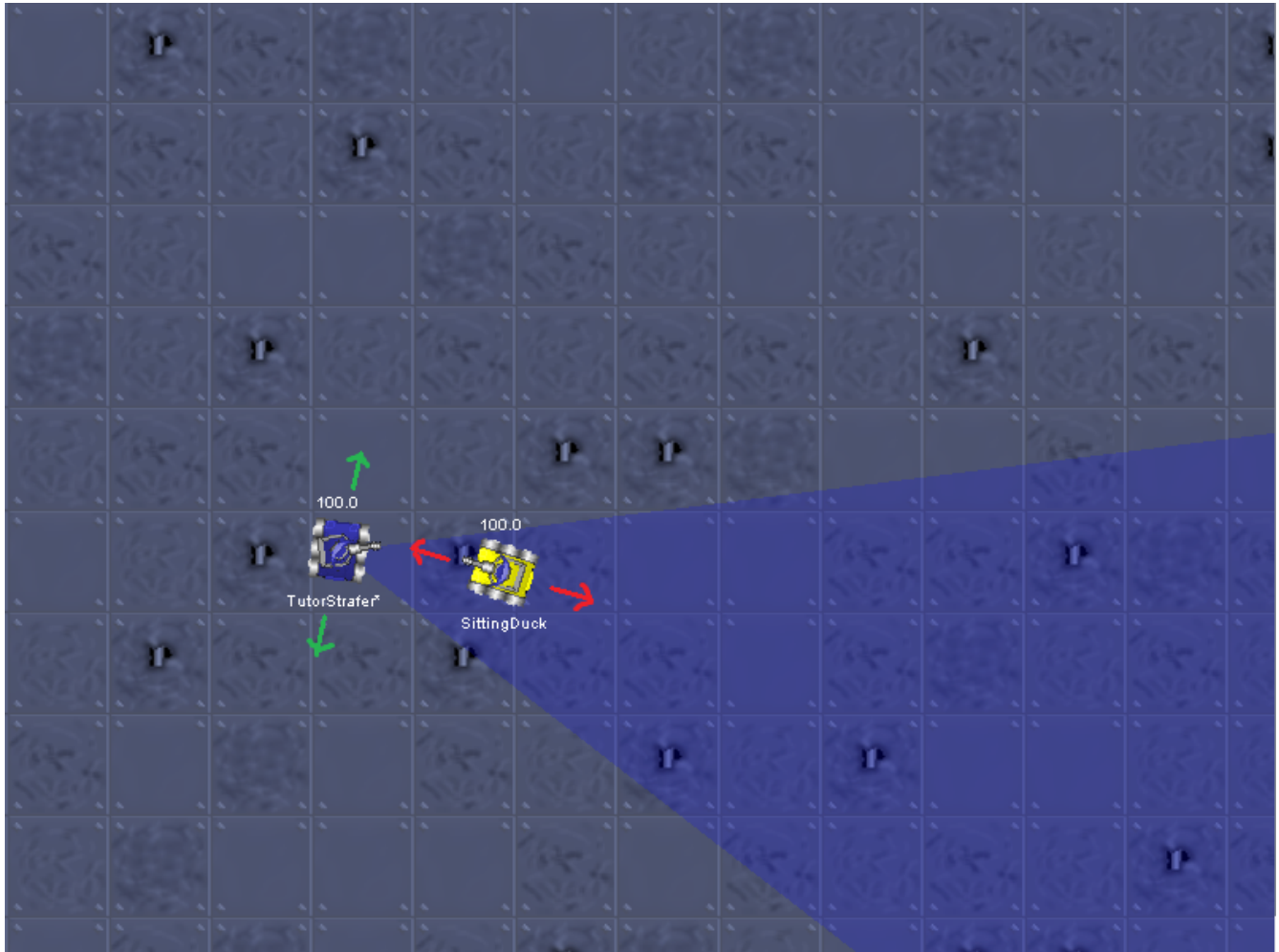
Assignments

1. fire a bullet with strength relative to the distance of your enemy (hint: use a formula, not a sequence of if's)

Positioning

Strafing

If you ever played a first person shooter you know the key in dodging bullets is strafing. By putting your robot perpendicular to your enemy you will be able to dodge his bullets more easily while punishing him.



Assignments

1. make your robot turn perpendicular (90 degrees) to your enemy