# How to create and improve the "Gaten-Schiet Demo"

## How to get the correct software

In order to get the correct software: check-out the latest version of the software. Copy the demo-software to the Turtle as usual and start the trc.

## How is the demo implemented/what do you need to know

• The position of the holes with respect to the center of the field is programmed in the code and cannot be changed!
• This means that if the robot shoots all the time next to the holes, the only option is to shift the goal to the side (or recalibrate the heading of the robot, the mask and the ballhandling)
• The height of the holes is a tunable parameter but can be calibrated in three different ways
1. edit the height of the holes using the two tunable parameters
2. edit the maximum shoot force to shoot harder or less hard
3. vary the distance of the robot to the goal
• The robot does not calculate the distance to the goal, hence, shooting from a constant distance to the goal gives (once calibrated) the best results! (in theory!)

## How can we start the demo

• Make sure that the calibration of the robot is ok, localization and heading are the most important issues to check.
• Copy the software
• Start the software
• Set the tunable par: *K_do_large_goal_holes_demo* to 1
• Put the TRC in Penalties mode
• Make one turtle attacker main with the correct home-goal
• Use the following buttons to shoot on the specific holes (as seen from the turtle!)
◦ Soft: top left
◦ Medium: top right
◦ Hard: random in the lower holes

## Tuning

As mentioned before, the turtle can be tuned to be able to be better than humans, Edgar Davids and even the world champion free kicks! The following tunable parameters can be used to improve the behavior. The default value provides a reasonable value for the penalty demo.

**Strategy**
• *AHaimPrecision*: if the distance between the target and the point where the robot is aimed at (in meters) is smaller than this number, the robot can shoot. Do not make this number to small because in that case the robot does not shoot at all!! (default : 0.03)

**Motion**
• *SF_v_max_rotate_aim_refbox*: maximum rotational speed during aiming. Decreasing this value makes the movement of the robot more slow when the robot has the ball and results in less movement of the ball and hence more accuracy (default :0.5)
• *SF_a_max_rotate_aim_refbox*: maximum rotational acceleration during aiming. Decreasing this value makes the movement of the robot more slow when the robot has the ball and results in less movement of the ball and hence more accuracy (default :0.5)
• *K_maximum_value_flat*: shooting power, for shooting at all holes the same value (default 1.0)
• *K_width_holes*: width between holes (default 0.6) TUNE THIS!
• *K_height_hole2*: angle for top right hole (value between 0 and 1) (default 0.65) TUNE THIS!
• *K_height_hole3*: angle for the lower holes (value between 0 and 1) (default 0.49) TUNE THIS!
• *K_FFBallSpeedOnAimTarget*: set to 1000 and do NOT tune.
• *K_retract_ball_time_in_ms*: set to 100 and do NOT tune.
• *K_shoot_when_retracted*: set to 1 and do NOT tune.

## Tips and tricks

Always shoot with the same ball at right pressure (+0.6 bar), changing the ball can make a big difference in the tuning. Also keep the Turtle after tuning the same!