Week 16 presentation in DD2438

Group 3:1

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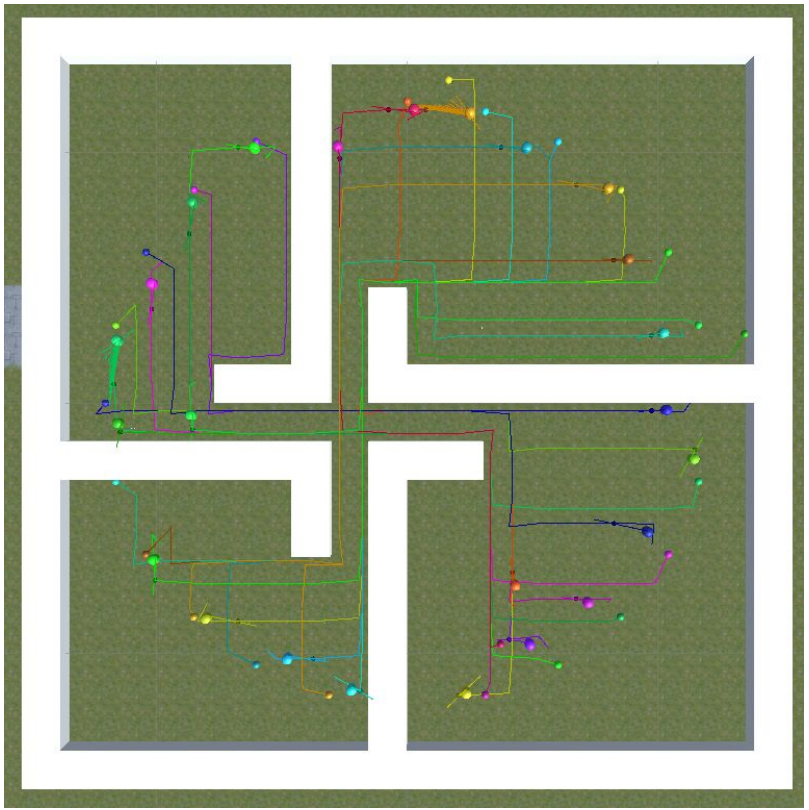
Traffic - Terrain AA

- Do BSF on the grid for each drone to its goal.
- After finding the best path through the graph. Add right hand traffic, shift all roads to the right.
- Create a priority list of which drone is prioritized (A lower priority drone needs to wait for a higher priority one.)



Traffic - Terrain AA

- Collision avoidance are handled using linear algebra, angles and distances.
- Priority is changing when necessary
- Managed to overcome problems but a bit slow (300s)

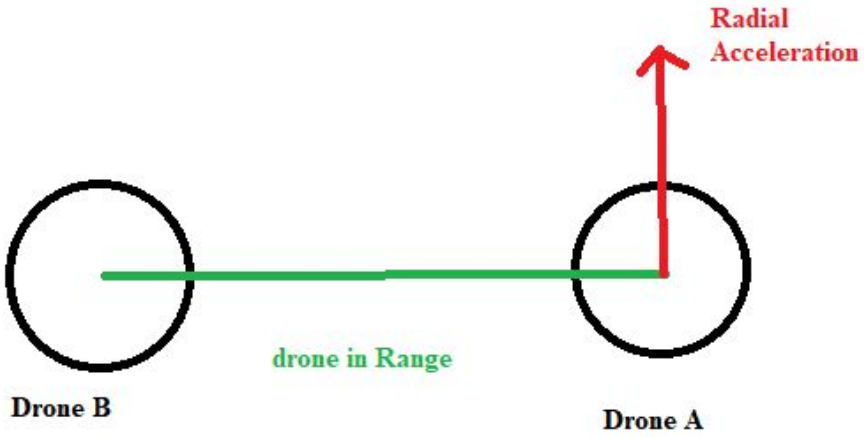
Traffic - Terrain BB

Strategy:

- Move straight towards Goal
- Dodge

Notes:

- Dodging happens whenever an obstacle is in range
- Dodging is efficient if every agent has the same dodging mechanism
- Radial acceleration is proportional to its relative distance to the closest drone.

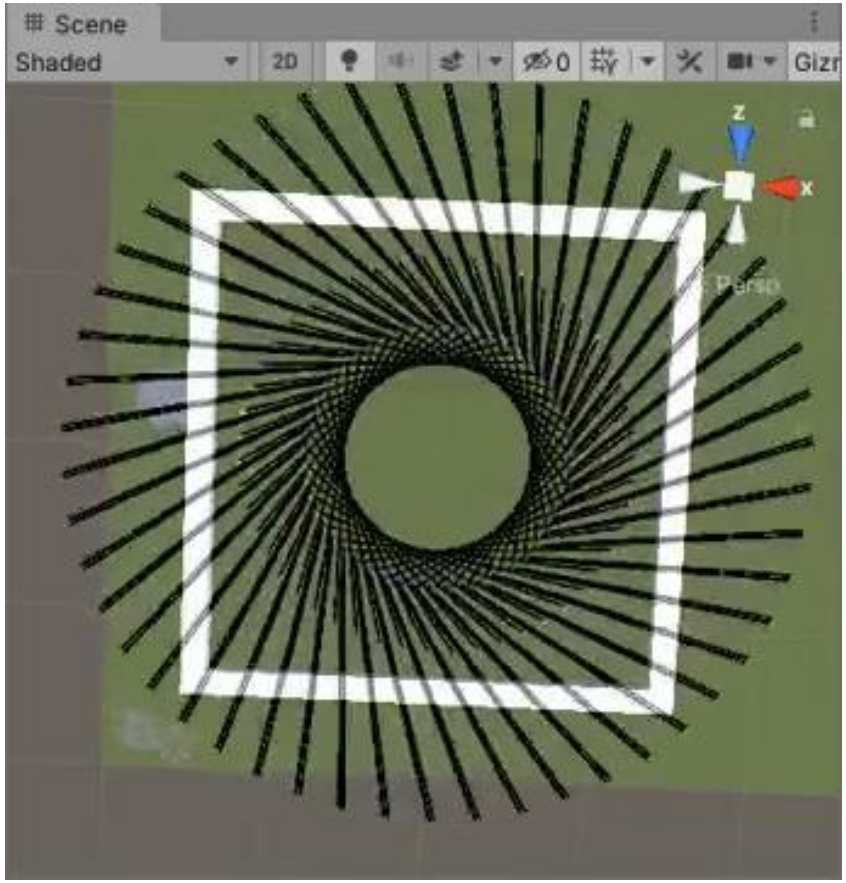


Traffic - Terrain BB

- Completed the task (20.8747s)

Hyperparmeters:
- *max velocity (15.0f m/s)* (is capped to prevent oscillations when they are very close to their respective goal). (alternative easy-fix solution would be dampening the velocity exponentially when it gets close enough to the goal.
- *time to update the velocity (0.010 s)* gives enough time for the drone to react and dodge other agents.
- *Range (10.0f m)*

Notes:
- there is an inverse proportionality relationship between *max velocity* and *time to update the velocity*
- It's this delay that makes the drones to work: if they update their velocity every instant they will get stuck. However this is always the case in a real world scenario.


Scene
Shaded
2D
Gizr
z
x
Persp

Drone Soccer

(1) Behaviour Tree with three different roles:

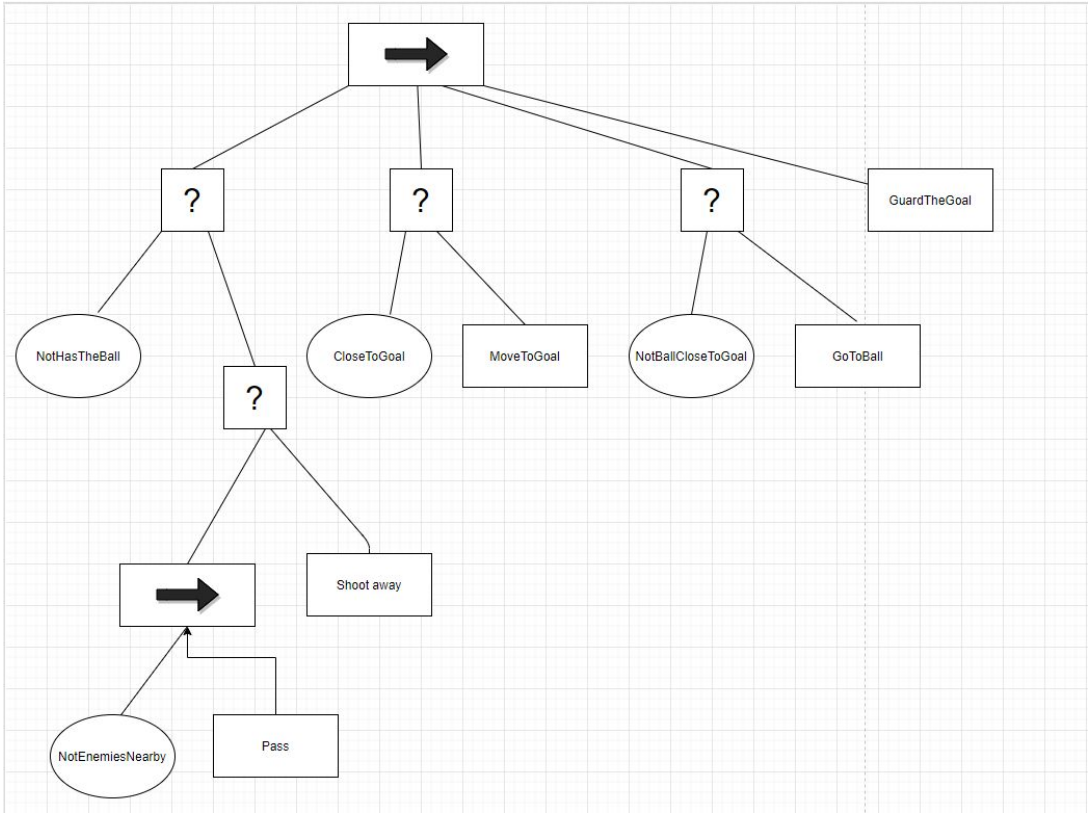
- Goalie
- Defender
- Attacker

(2) Manager to assign role according to the state of the game

Goalie

It performs the following tasks

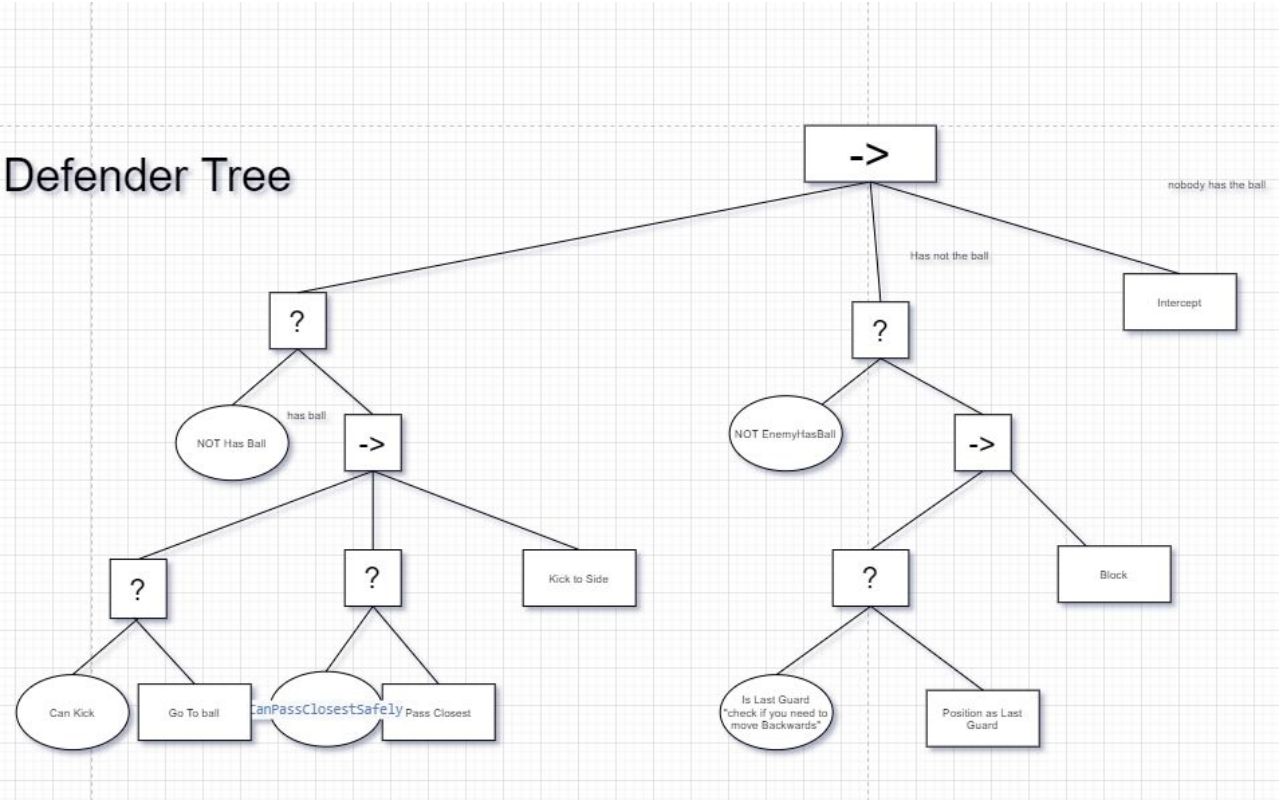
- Shoot the ball Away from the penalty area
- guard and block the ball



Defender

It performs the following tasks

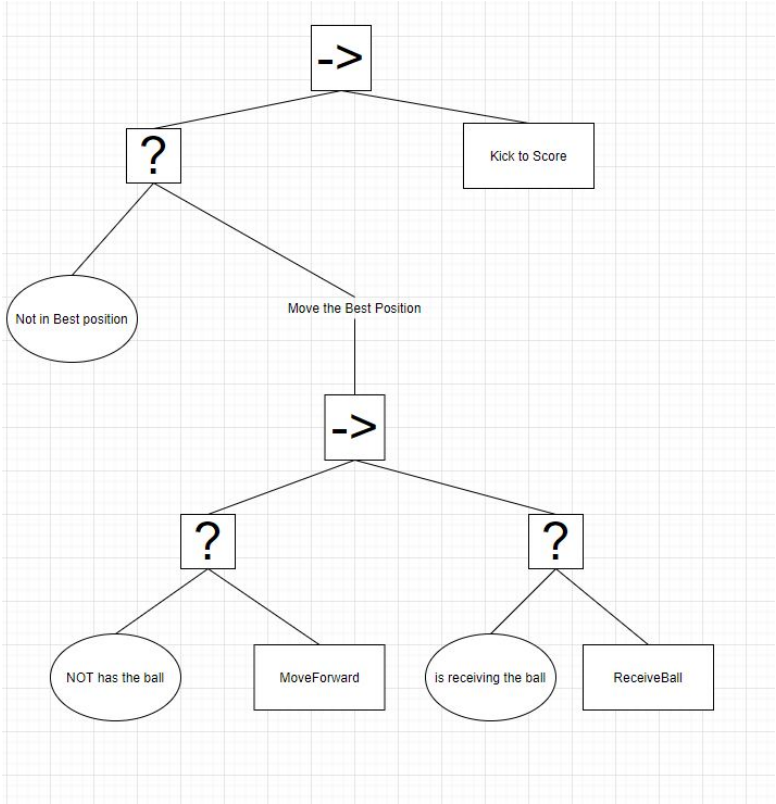
- kicking the ball outside the penalty area
- block enemies
- intercept ball
- Pass to attacker



Attacker

It performs the following tasks

- kicking the ball to score
- move forward
- position itself to receive the ball



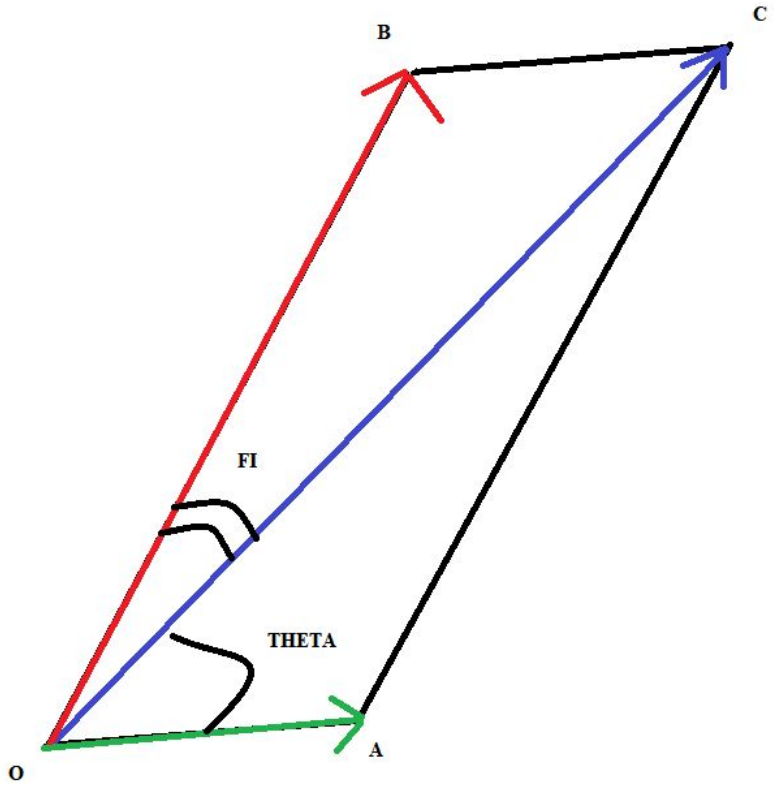
Additional Notes

Kick to Score function:
evaluating the velocity of the ball (green)

desired trajectory (blue)

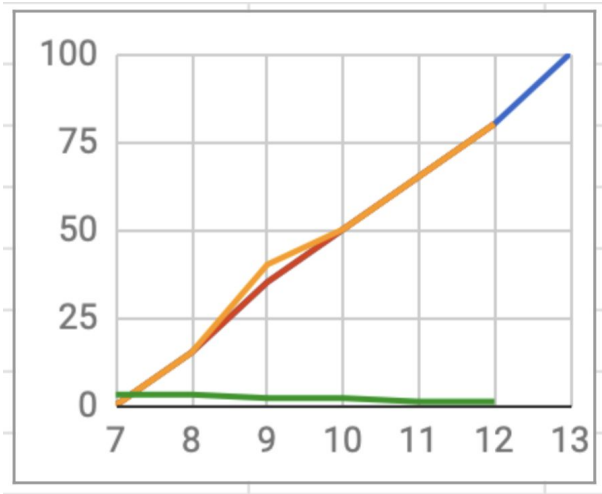
required kick (red)

We used trigonometry to find right angles.



Progress Status Week 14

- Comment to customer paying 200 000kr for the report:
  - Solved TerrainAA
  - Solved TerrainBB
  - Solved Soccer
- Planned Time spent: 55%
  - (Out of the combined 200h)
- Actual Time spent: 65%
  - Out of the combined 200h
- Actual Progress: 55%
  - (estimate progress towards completing assignment)
- Risk of not completing assignment: 10%



Include this slide, but do not spend time discussing it at the presentation. Remember to also fill in the Progress Report Google Sheet