

Grid car race – round #3

The environment used in round #2 is carried over, but in this round the race track may also contain oil and sand spills. The modified environment can be accessed at the following URL:

<http://users.itk.ppke.hu/~karacs/AI/competition/env3.html>

Locations covered by oil or sand are considered valid track points, however, moving away from these locations is nondeterministic if the velocity of the agent is nonzero. An agent arriving to an oil spill will proceed with approximately the same speed, but the direction of its motion becomes stochastic. Sand spills decrease the speed of an agent arriving onto them, and also make the direction of its motion stochastic.

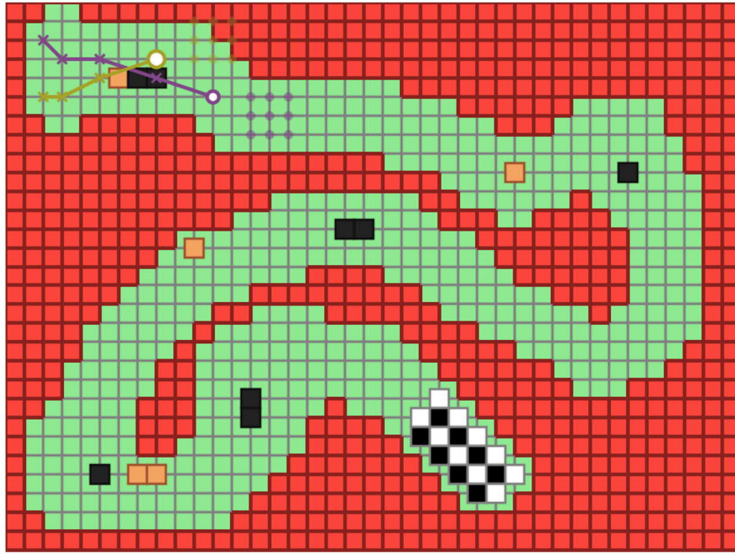


Figure 1. Sample track with oil and sand spills.

Agents that have come to a full stop on an oil or sand spill can choose their next step, and it will be carried out deterministically.

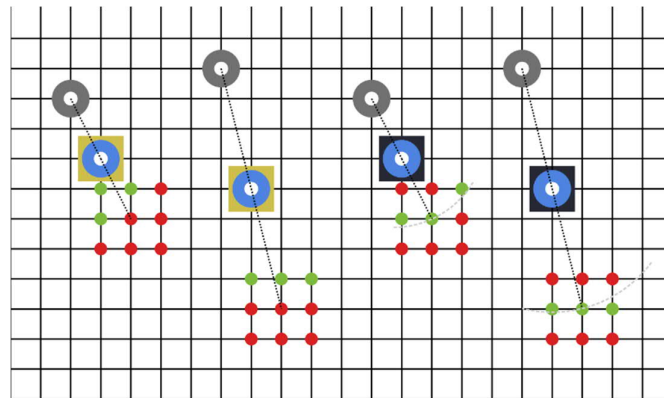


Figure 2. Sample scenarios for traversing oil spills and sand spills. Gray circle: previous position; blue circle: current position; black rectangle: oil spill; sand-colored rectangle: sand spill; red and green dots: target position matrix, target candidates are selected from among the green dots.

Let d_{ij} be the distance from the current position to the candidate positions of the next move (i,j) , with $i, j \in \{-1, 0, 1\}$. Distances are Euclidean distances.

If a player is on a sand spill and it has a nonzero velocity, then upon its turn it is automatically moved on to one of the three closest positions. The actual landing position is determined randomly with a uniform distribution over the set of three candidates with the smallest distance from the current position.

Oil spills behave similarly to sand spills, but they do not affect the speed. If a player has a nonzero velocity, then upon its turn it is automatically moved to one of the three positions located at about the same distance as the center position, including the center itself. In this case the actual landing position is also determined randomly, but with a uniform distribution over the set of three candidates for which $|d_{ij} - d_{0,0}|$ is the smallest, which set always includes the center position itself.

Oil and sand spills are marked by numeric values “91” and “92” in the track field matrix, and they are shown in black and sand-color, respectively.

Since oil and sand spills are considered valid track points, the function `validVisibleLine()` has not been changed.