

Informatik für Mathematiker und Physiker Lösung 8 HS 10

URL: http://www.ti.inf.ethz.ch/ew/courses/Info1_10/

Aufgabe 1 Extend the floor by a third dimension, representing the current direction of the robot. That is, introduce three new layers that are copies of the original floor. Each layer represents a particular orientation of the robot (left, right, up, down). The robot starts in a particular cell, and with a particular orientation. The latter fixes the layer it starts in. When growing the frontier of labeled cells, simply take the new neighbors along the third dimension into account (directions differing from the current one by $+90$ or -90 degrees). The shortest path is the first one that reaches the target in any of the four layers.

The following figure shows a shorter path in the new model.

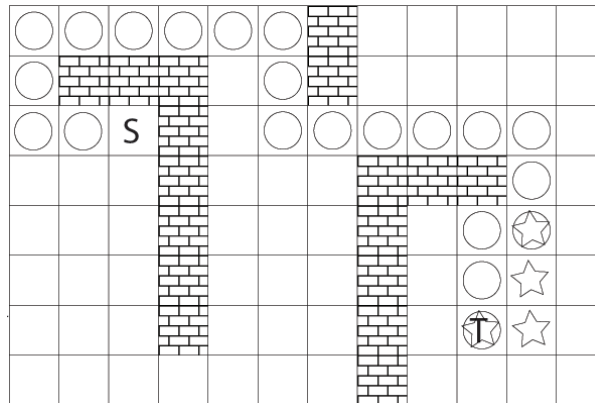


Abbildung 1: The alternative path marked by stars is shorter than the one consisting solely of circles, because it turns one less time.