

Way Home



Figure 1: Street sign in northern Norway

Model

A drunk person tries to cross a street (8m).

He starts the right way but every t time units he changes direction.

He always moves with a velocity of 2m/s.

The sidewalk and the middle of the street are 'safe'. If he is on the street (2 directional - 1m and 3 m from the sidewalk) he can be hit by a car.

Cars have an intensity of 0.05/time unit coming from both directions.

Simulation is finished if he is either hit by a car or reaches one of the both sidewalks.

To Do's

Simulate the man's movement using the following assumptions:

A

- $t=1=\text{constant}$
- change in direction is always $\frac{1}{4}$ probability left, $\frac{1}{4}$ right, $\frac{1}{2}$ forward

B

- $t=1=\text{constant}$
- new direction = old direction $+\alpha$ with α is uniformly distributed in $[-2/3\pi, +2/3\pi]$

C

- t is exponentially distributed with intensity 1/time unit
- new direction = old direction $+\alpha$ with α is uniformly distributed in $[-2/3\pi, +2/3\pi]$

Calculate the Probability of the man's survival and the probability of him reaching the other side of the road for all three parameter sets.

Programming Languages

MATLAB