Computer Architecture Laboratory - Report

Assignment-0

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1 Assumptions Parameters

We take different value's of Pr(i.e here we have considered Pr as the probability of turning the sensor On) to get the time taken to cross the border:

$$\text{Pr} = \{0.2 , 0.3 , 0.6 , 0.9 , 0.1\}$$

We also take different value's of width W and use it to find time against various values of Pr:

$$\text{W} = \{3 , 4 , 6 , 2 , 8\}$$

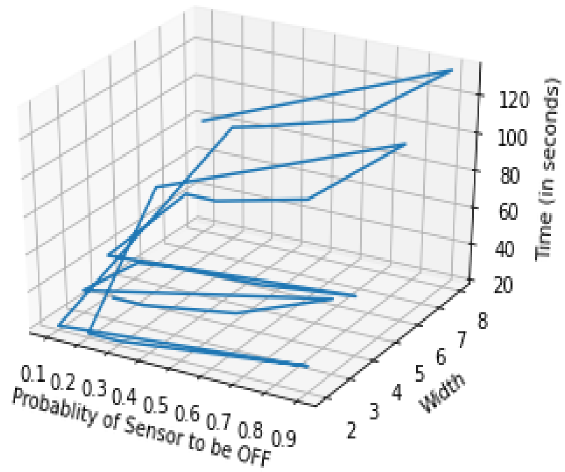
2 Approach

As the probability of sensors turning on is independent of each other , then we only need to consider a point's immediate neighbours i.e. 8 cells surrounding it . So the greedy way to minimise the time is to always move forward if there is a way possible .Hence if the sensors above it are on , then it will go forward , otherwise it will stay in it's own position . Thus we have implemented this greedy approach for each simulation.

3 Observations

3.1 Observation 1

For any width, the lesser the value of Pr , more easily infiltrator can cross . Thus time reduces. This is because for the higher value of Pr , there is a very high chance that the sensor will be in On state, then the infiltrator can easily cross the border.



3.2 Observation 2

For any probability, as the width increases then the time taken by the infiltrator also increases. This is because due to large width, the infiltrator needs to pass through many sensors in the On state. So it takes more time for the infiltrator to cross the border.

Following are the graph parameters:

- X axis specifies Width of the border.
- Y axis specifies Probability of the sensor to be On.
- Z axis specifies time taken to cross the border.

4 Result

From the above observations we see that the infiltrator takes less time only when the value of Pr is low and value of W is low.