

Computer architecture

Assignment 0

Ashwin Waghmare 210010060

Tejal Ladage 210010026

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1 Introduction

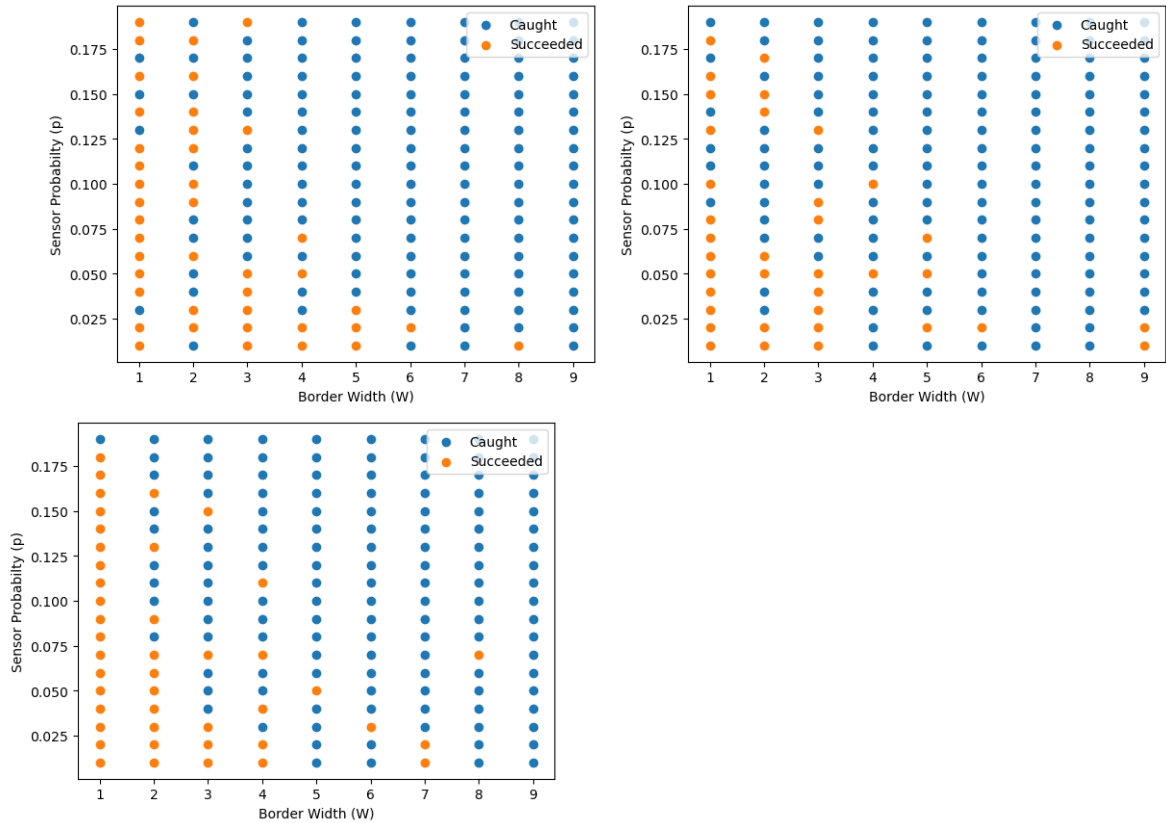
Consider the scenario where one country, called the defending country (DC), wishes to defend its border against another country, called the attacking country (AC), whose aim is to send an infiltrator to cross the border and enter DC's land. DC decides to deploy a wireless sensor network along the border. If a sensor detects an infiltration attempt, DC can then send its troops to counter the infiltration.

2 Infiltrator

The infiltrator is designed such that it has equal probability of making moving to all the available cells.

3 Graphical Analysis

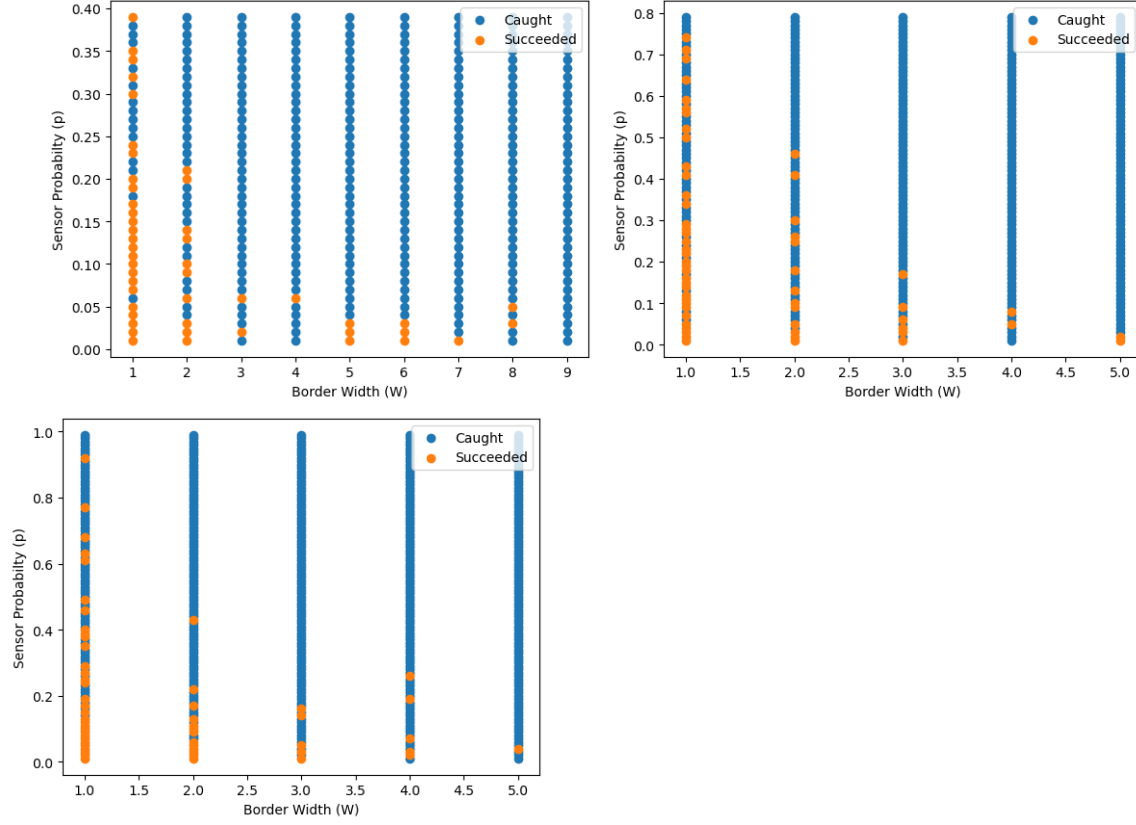
Here we have varied Width of border with Probability of Sensor being on. In the following three graphs the width of border varies from 1 to 9 while the sensor probability varies from 0.01 to 0.2 with a step of 0.01 .



We can make the following observations:

- For width 1, the infiltrator almost always succeeds in crossing the border.
- For lower widths (2-4), the infiltrator seems to succeed in probability less than around 0.075.
- For higher widths the infiltrator almost never succeeds even in low sensor probabilities.

The following three graphs also have the same variation with a higher sensor probability range.



Here we can observe that for higher sensor probabilities the infiltrator almost never succeeds in crossing the border.