

PSYC 1340 / VLST 2110 Perception

Recitation 5 - Probability and Receptive Fields

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Probability Practice

Imagine we randomly pick someone from the class and record their birthday. Now we randomly pick another person from the class. What is the probability that the two students share a birthday? The probability that they don't share a birthday?

What is the probability that two or more people share a birthday if there are 3 people, 4 people, etc?

Assume 365 days in a given year, no leap year birthdays.

Programmatic solution

```
function bday(prob: number, stu: number) {
  return 1 - (prob * (365 - stu)/365)
}
let prob = 1;
for (let stu = 1; stu ≤ 15; stu++) {
  prob = 1 - bday(prob, stu);
}
```

```
function bday(prob: number, stu: number) {
  return 1 - (prob * (365 - stu)/365)
}

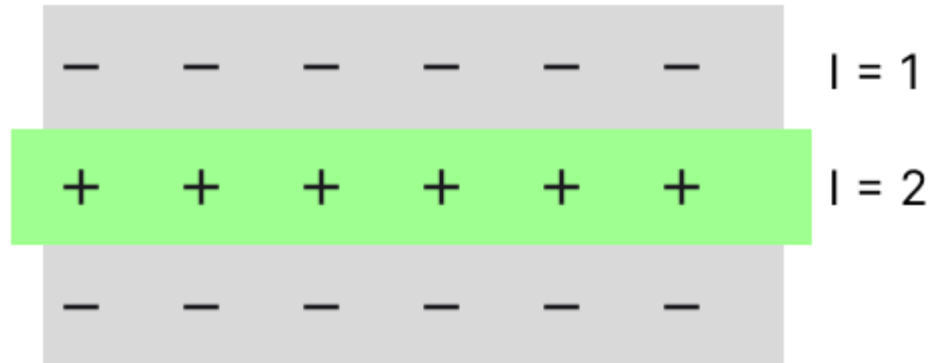
let prob = 1;
for (let stu = 1; stu ≤ 15; stu++) {
  console.log(`Number of students: ${stu} | P(all different) = ${prob.toFixed(4)} | P(2 or more share) = ${(1 - prob).toFixed(4)}`);
  prob = 1 - bday(prob, stu);
}
```

Number of students: 1	P(all different) = 1.0000	P(2 or more share) = 0.0000 = 0.00%
Number of students: 2	P(all different) = 0.9973	P(2 or more share) = 0.0027 = 0.27%
Number of students: 3	P(all different) = 0.9918	P(2 or more share) = 0.0082 = 0.82%
Number of students: 4	P(all different) = 0.9836	P(2 or more share) = 0.0164 = 1.64%
Number of students: 5	P(all different) = 0.9729	P(2 or more share) = 0.0271 = 2.71%
Number of students: 6	P(all different) = 0.9595	P(2 or more share) = 0.0405 = 4.05%
Number of students: 7	P(all different) = 0.9438	P(2 or more share) = 0.0562 = 5.62%
Number of students: 8	P(all different) = 0.9257	P(2 or more share) = 0.0743 = 7.43%

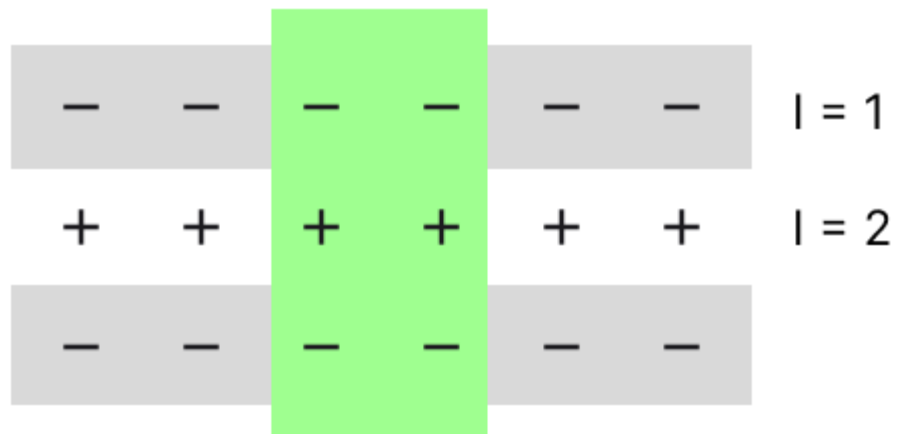
Receptive Field Response



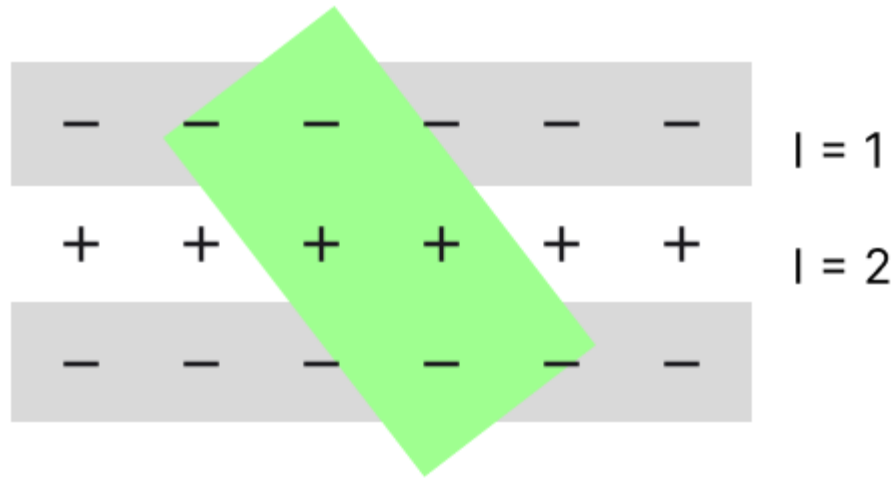
Receptive Field Response



Receptive Field Response

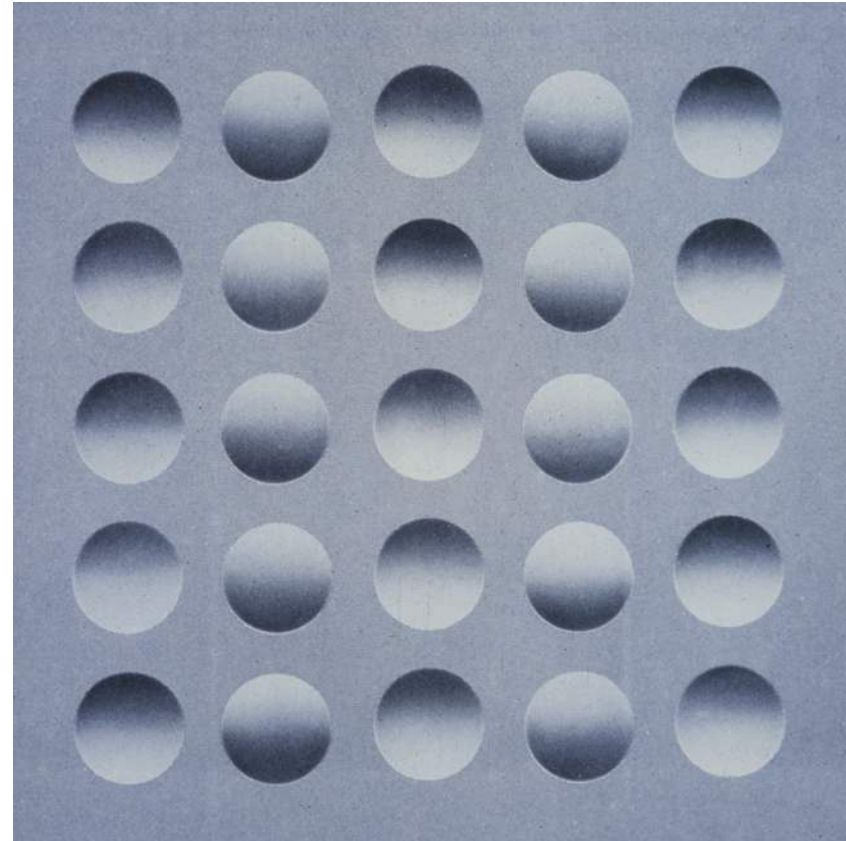


Receptive Field Response



Helmholtz midterm question review

Explain why we see some columns of the image below as bulging towards us and others as bulging away from us, using Helmholtz's principle of perception as reconstruction/unconscious inference. As part of your answer, provide a one or two sentence description of what this principle is.



Steogram midterm question review

You discover a new technology that allows you to independently control the images arriving in the left and right eyes. To demonstrate that your discovery works, you decide to construct a random dot stereogram. You start with a field of random dots and make a copy for the left eye and a copy for the right eye. You shift a square patch of dots within the left eye copy to the left (to the left as seen by the observer) and the same square patch of dots within the right eye copy to the right (to the right as seen by the observer). You use your invention to present these images to a friend and indeed they see the square at a different depth than the rest of the dots. Given the way the random dot stereogram was constructed, we expect that

- a. the square appeared to be in front of the rest of the dots.
- b. the square appeared to be in back of the rest of the dots.

See you next week!