



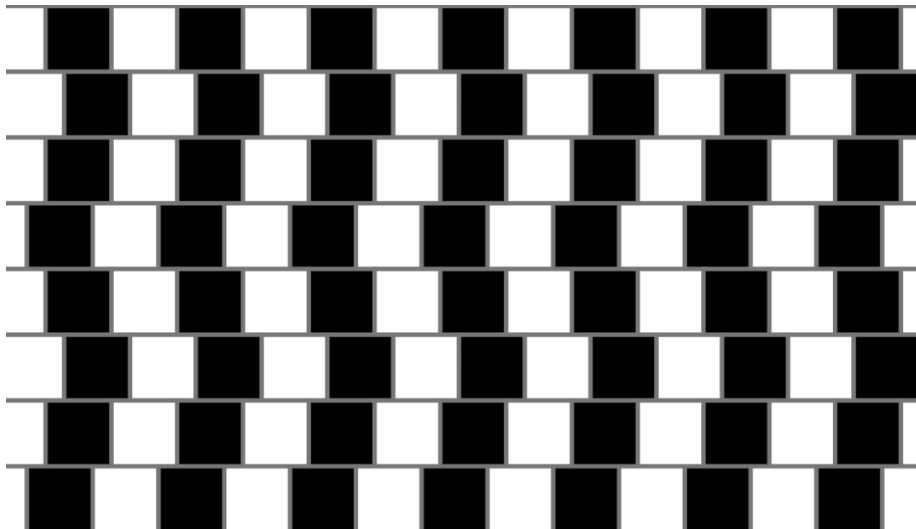
Activity 2: The Café Wall illusion and its underlying neural mechanisms

Another interesting visual illusion is that of the “Café Wall”. This took its famous name from the wall tiles of a café in Bristol. As noticed by Professor Richard Gregory (See the ‘Explore More’ section for further info), the pattern looks like that of a normal chessboard, but unlike one of those, here the tiles are separated by thin grey lines, called “mortar” lines.

Task

1- Observe Figure 2 below: are the lines straight?

2- Now take a ruler or a set square and test whether you were right!



Fibonacci (https://commons.wikimedia.org/wiki/File:Café_wall.svg), „Café wall”, <https://creativecommons.org/licenses/by-sa/3.0/legalcode>

3- Now read the explanation below and explore the illusion further on this online platform: www.joyfulcoder.net/cafewall/ You can vary the different parameters and see how the illusion changes

Why would a symmetrical image appear as non-symmetric? Or in other words, why do the lines appear sloped despite being horizontal and parallel to each other?

This is an example of a distortion illusion and is achieved thanks to the exploitation of some properties of visual processing, although the exact mechanisms are still not completely understood.

The first thing to know is that neurons respond in a different way depending on the luminance of the objects perceived, meaning that they will react differently to the white vs black tiles.

Secondly, there are neurons in the visual cortex that are orientation-specific (i.e. they fire only for specific orientations). Given this information, a possible explanation for what might be happening in this illusion was put forward by Gregory and Heard (1979). They suggest that it is the combination of the position of the tiles, their differences in luminance and the thickness of the grey mortar lines that give rise to the illusion, due to the way in which neurons in the visual cortex interact during the processing of these features. They further explained that the lines appear as sloped because of the dark and light colours of the mortar lines, which the neural cells can perceive as being either brightened or darkened, giving rise to non-stable percepts.

Explore More...

If you want to expand your knowledge about this topic, you might find the following resources useful:

- Explore the illusion on this online platform: www.joyfulcoder.net/cafewall/
- Take a look at this from the Illusion Index: <https://www.illusionsindex.org/i/cafe-wall-illusion>
- Finally, click here if you want to explore more about the great work on illusions from Richard L. Gregory: <http://www.richardgregory.org/experiments/>