

Project title :

How selective attention warps our perception

Project description :

The outside world appears to us, immediate, in detail, and seemingly without any effort. We generally don't question that this is the actual world we live in. However, what we see depends on what we know and what we are searching for.

For example, when looking at the neighboring image for the first time, you might just notice a bunch of colored lines. However, if you now search for the yellow line elements, you will find them within an instance, and see that they form a square. Also, if you now look for a circular contour in the blue line elements, you will quickly find it as well.

Moreover, you can now switch between seeing the circle and seeing the square, and notice how your perception gets warped when switching for one to the other. This illustrates how our perception is an active process that relies on what we attend to, what is relevant for us at a given moment in time.

In this master internship project, we will use a contour detection task as in the image above, combined with a measure to judge the perception of orientation, to carefully quantify how feature-based attention changes our perception.

This work will prepare for parallel experiments in macaque monkeys, where we will use multi-photon imaging to investigate the neural mechanisms of this process in great detail.

**Tasks :**

- Design and optimize carefully controlled psychophysics experiments
- Collect large behavioral datasets, using an online psychophysics platform
- Analyze large behavioral datasets, using information theory & statistical analysis
- Contribute to writing the corresponding manuscript

Requirements :

- Computer programming skills (Python or Matlab)

Supervisor :

dr. Timo van Kerkoerle (timo.vankerkoerle@donders.ru.nl)

Further information :

<https://www.ru.nl/en/departments/donders-centre-for-neuroscience/top-down-vision>