

VISUAL MOTION PROCESSING - INSTRUCTIONS

EXPERIMENTAL PROCEDURE

This experiment consists of six sessions, in which you will perform a visual motion task. Each session will last about 2 hours, and will consist of initial explanations and examples of the task (first session only), setting up the eye tracker, and several blocks of testing.

We are studying in how people process visual motion, and make decisions about moving images on the screen. In this experiment, you will sit in front of a computer screen, and will be shown many trials, or repeats, of the same task. The training sessions are broken up into short blocks of about ten minutes, and I encourage you to take breaks in between.

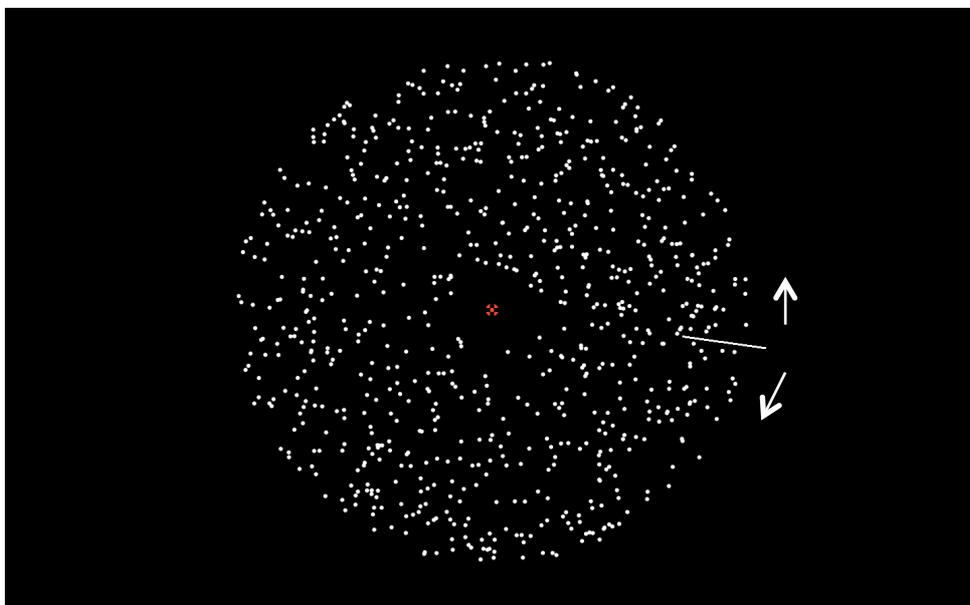
EYE-TRACKING

The EyeLink eye-tracker used in this study measures where on the screen you are looking, and how the size of your pupil reacts to things that you see on the screen. To make sure that this eye-tracking records correctly, we will start each block in the experiment with a *calibration* of the camera. I will adjust the camera so it captures your eye, and you will see a dot on the screen that you follow with your eyes – this is a quick procedure and allows us to optimize the measurement.



STIMULI AND TASK

Every block consists of about several trials of the same visual motion task. In a display like the one below,



keep your gaze on the red fixation point in the center of the screen. We will go through a training session together to make sure you understand the task. The trial consists of several stages:

- 1. Blank screen:** Each trial will begin with a black screen. The red fixation appearance indicates that the trial is about the start.

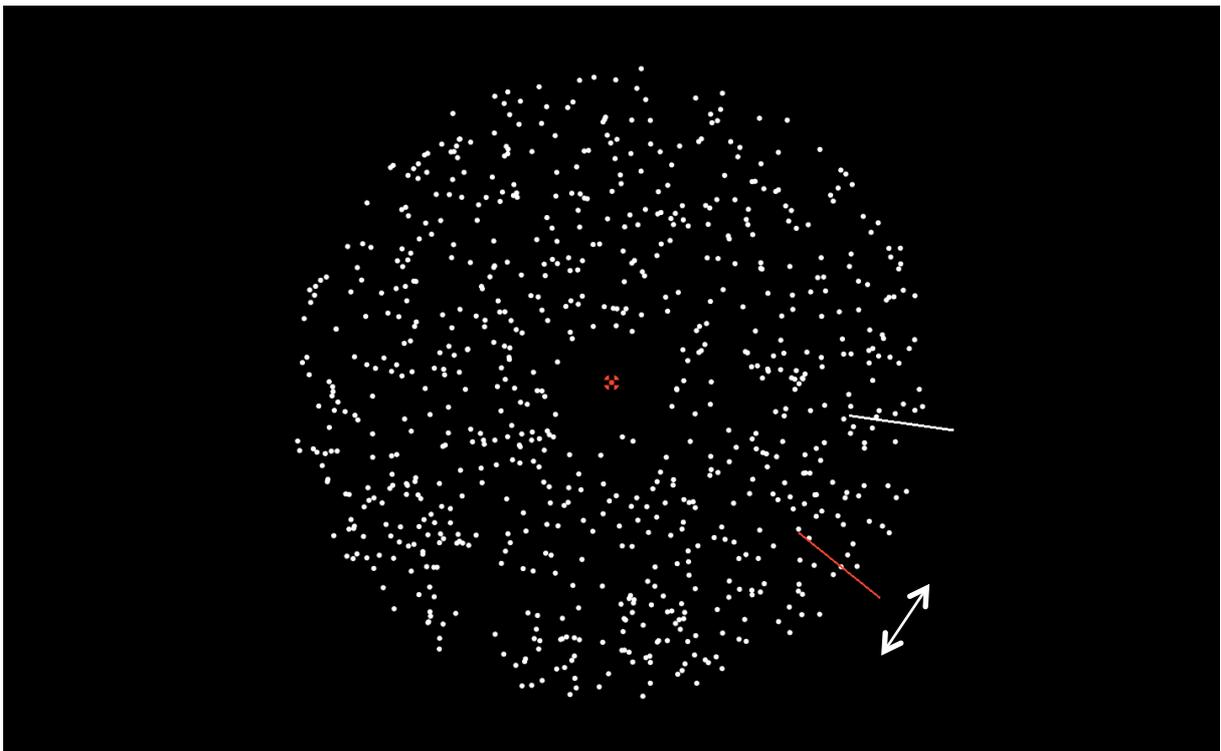
2. **Interval 1:** You will see a cloud of dots moving, with some of the dots moving together in a particular direction. Your task is to determine whether the dots are moving to the **left** or to the **right** of the reference mark.
3. **Response:** Once the dots stop moving, you will then hear one of two tones. One is a prompt to report your decision about the direction by clicking the corresponding mouse key (left or right). The other tone is a prompt to press the center mouse wheel to continue. We will review which tone corresponds to which action together in the training session. Try your best to do make this decision as quickly and accurately as possible.
4. **Pupil measurement:** After the prompt and response, there are again a few seconds of stationary dots to let your pupil adapt. It is very important that you do not break fixation, or blink your eyes, while the stationary dots are on the screen – this will make the eye tracking camera lose the signal of the pupil that we're measuring.

SOME TRIALS WILL CONTINUE WITH...

5. **Feedback:** Once you've pressed a mouse key, you will hear feedback about your response in some trials. If your choice was correct, you will hear a high beep. If your choice was incorrect, you will hear a low beep. Following feedback, you will move on to the next trial.

OTHERS WILL CONTINUE WITH...

6. **Interval 2:** In some trials, you will see a second cloud of dots moving, with some of the dots moving together in a particular direction. These dots may have a different angle of motion from the first stimulus. Your task is to determine and estimate what the average overall angle of motion is from this cloud and the first one combined.
7. **Response:** When the dots stop moving and the reference mark will turn red, you must complete an estimation task. Move the mouse to align the cursor to the average angle of motion you saw in the two trials. Once you are satisfied with your estimate, click the mouse to confirm your response.



8. Blink Break: When you see a blank screen, the trial is over and you will have the opportunity for a blink break. Rest your eyes for a moment to help you keep them open and fixated during the experimental trials. You may blink your eyes as long as you need to. When you want to continue the experiment, click the mouse to continue.

After each block of around 10 minutes, you will see a screen indicating your performance on the last block and telling you to take a break. You can either relax a bit and continue when you feel like it, talk to me over the intercom, or ask to have a longer break and go out of the experimental room for a bit. I recommend you do this and stretch your legs at least once or twice during the session.

SO REMEMBER...

- The experimenter can always hear you through the intercom, so just talk to me if there are any problems.
- Keep fixating on the red point in the middle, and only blink when there are no dots on the screen.
- If everything goes well and you complete all 6 sessions, you will receive 12 research credits.
- Because this experiment is about slight variations in stimuli, it will be quite challenging in the beginning. Don't be discouraged and don't give up; you will see that your performance will improve with every session!

Good luck! 😊