

Saccades Eye Movements

Saccades¹⁾²⁾ are rapid, jerky eye movements that allow us to quickly and accurately shift our gaze from one point to another. They are a crucial part of our visual system and allow us to process visual information effectively.

Transformations of the visual field
toward the visual map on the
primary visual cortex in vertebrates.
InkassoSchroeder „Saccades“ CC-BY-
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During a saccade, the eyes move in a series of quick jumps rather than moving smoothly as they do during smooth pursuit eye movements. These movements are typically very fast, with saccades occurring at speeds of up to 900 degrees per second.

Saccades are controlled by the brain's oculomotor system, which includes a network of neurons located in the brainstem and the basal ganglia. These neurons send signals to the muscles in the eye, causing them to contract and move the eye in the desired direction.

There are several different types of saccades, including voluntary saccades, which are initiated by the conscious decision to move the eyes, and reflexive saccades, which are triggered by stimuli in the environment. There are also microsaccades, which are very small saccades that occur spontaneously and are thought to play a role in maintaining the clarity of the image on the retina.

Saccades are an essential part of how we interact with the world around us, allowing us to rapidly scan our surroundings and gather information. They are also important for reading, as they allow us to quickly move our gaze from one word to the next while reading text.

Oculomotor system

The brain's oculomotor system is a network of neurons and brain structures that control eye movements. It is responsible for initiating and coordinating movements of the eyes, including saccades, smooth pursuit, and vergence.

The main components of the oculomotor system include:

- **The oculomotor nucleus:** This is a group of neurons located in the brainstem that sends signals to the muscles that move the eye.
- **The superior colliculus:** This is a part of the midbrain that receives input from the visual system and sends signals to the oculomotor nucleus to initiate eye movements.
- **The frontal eye fields:** These are areas of the brain located in the prefrontal cortex that are involved in initiating voluntary eye movements.
- **The parietal eye fields:** These are areas of the brain located in the parietal lobe that are involved in coordinating eye movements with head movements.
- **The basal ganglia:** These are a group of brain structures located deep in the brain that are involved in the control of voluntary eye movements.

The oculomotor system works together to coordinate and control eye movements, allowing us to rapidly and accurately shift our gaze to different points in our environment.

Saccades and Memory

Saccades themselves do not create memories. However, the visual information that is gathered during a saccade can be stored in memory.

When we look at something, our eyes are constantly making saccades as we scan and gather information about our surroundings. This information is processed by the brain and can be encoded as a memory.

For example, if you are looking at a person's face and making saccades to gather information about their features, you may later be able to recall what they looked like or even recognize them in the future. This is because the visual information that was gathered during the saccades has been stored in your memory.

Saccades themselves are not directly related to memory formation, but they do play a crucial role in allowing us to gather and process visual information, which can then be encoded as a memory.

^{1), 2)} Saccade [Eyewiki](#)

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