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Faculty of Engineering
Summer Research Program 2023-2024

Project Title: Erasing the Mind's Eye

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Objective

Visual afterimages are the lingering sensations of a previously viewed image that persist even after the image is removed. They are often experienced as ghost-like or residual images that appear to "hang around" in the visual field for a brief period of time after looking at a bright or high-contrast image. Afterimages are undesirable in a number of contexts, so we are looking for ways to reduce how long they persist by applying different patterns of visual images.

Project Details

Visual afterimages are a result of the way the eyes and the brain process visual information. When the eyes are exposed to a bright or contrasting stimulus, light-sensitive cells in the retina (and the neurons they go on to activate in the visual processing cascade) become temporarily desensitised. When the image is removed, the desensitisation temporarily persists, so the brain misinterprets the pattern of activity overall, leading to the perception of an afterimage.

In this project, you will have the opportunity to contribute to research aimed at unravelling the secrets of the eye-brain interaction behind visual afterimages and developing techniques to reduce or erase them. This will involve creating experiments to test afterimage persistence and then additional experiments to test the impact of interventions on afterimages.

Prerequisites

Students should be competent in at least one programming language, the project will be in MATLAB.