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**Project Description:** An animal’s ability to maintain its sense of the world around it and be able to interact with its environment depends in large part on the nervous system’s ability to perform a few basic functions. The nervous system must reliably convert physical energy into neural activity, integrate various types of sensory information to construct a veridical representation of the external world, and be able use this information to generate accurate movements of various effectors (e.g. arm or eyes) in order to interact efficiently with the surrounding environment. For example, humans use a specialized receptor sheet (the retina) to convert photons into neural activity. This visual information, combined with information from other sensory modalities (e.g. sense of balance and limb position), is used to generate commands for future movements (e.g. a reaching movement towards a coffee cup). The veridicality of information at each stage of this sensory to motor transformation can make the difference between coffee ending up in your mouth or on your shirt!

The primary goal of my research program is to understand how the nervous system uses visual information to plan and coordinate eye, head, and arm movements so that primates, in particular humans, can interact efficiently with their environment (Cecala & Freedman, 2009, 2010). The current research emphasizes the human eye movement research branch of this program and focuses on comparing eye movement metrics (size, velocity, duration, etc.) when presented with: 1) only a single moving or static targets target; 2) when asked to decide on selecting a single moving or static target in a multi-target array; 3) when a target shifts during the movement causing a predictable visual error at the end of the movement. In brief, classifying normative behavior in young human subjects will allow future students to assess the effects of nervous system impairment associated with aging and disease on this common behavior.