

University of Maryland

Neuroscience and Cognitive Science Seminar

Dynamic 3D Scene Representation

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As an animal moves in its natural environment, to seek food, track targets and steer around obstacles, its distance and direction to objects continuously change, invoking dynamic feedback between 3D scene representation, attention and action-selection. Echolocating bats, for example, transmit sonar signals and process auditory information carried by echoes to guide behavioral decisions for spatial orientation in flight. Further, the bat adapts its echolocation signal design in response to 3D spatial information computed from echo returns, and therefore, the directional aim and temporal patterning of its calls provide a window into the animal's attention to objects in its surroundings. These adaptive behaviors require an interface between auditory processing and motor commands, and our research findings implicate the midbrain superior colliculus in sensory-guided spatial orienting behaviors. This talk will review behavioral and neurobiological studies of 3D sonar scene analysis in the echolocating bat, an animal whose active control over acoustic signals provides a window into its perceptual world.

Friday, March 9, 2018

10:15am, Room 1103 Bioscience Research Building

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