Ian P. Howard Memorial Lecture

Size matters: how size constancy works for perception and action

Melvyn Goodale

University of Western Ontario

Date: Friday, September 20th, 2024
Time: 2:00 – 3:30pm
Location: Senate Chambers, N940 Ross Building

Abstract

The images of people and objects on our retina are constantly shrinking and expanding as we move through the world. Yet remarkably we see a world that is stable, and things are perceived to be the size they really are. This is a good thing because otherwise our perception of the world would be chaotic and impossible to interpret. Our ability to see the real-world size of objects despite dramatic changes in the images captured by our eyes is called "size constancy". It's thought that our brain creates size constancy by taking into account how far away an object is and combining that information with the size of the object's retinal image. As a consequence, even though the image of a car driving away from us becomes smaller and smaller on our retina, we don't see it as shrinking in size but instead as a car that is the same size, but further away.

In this talk, I will discuss where these calculations take place in the brain and how long they take to unfold. I will also examine some of the differences between how size constancy operates when we try to make sense of objects in the world and how it operates when we act on those objects. It turns out that the sensory cues and the underlying neural circuits used for size constancy in perception and action are not always the same. Understanding how the brain maintains size constancy can help engineers who are trying to devise machine vision systems for everything from robots to self-driving cars.

Biography

Mel Goodale is Professor Emeritus in the Department of Psychology and Founding Director of the Centre for Brain and Mind at the University of Western Ontario. His early work, in which he demonstrated that the visual control of action is functionally independent of conscious visual perception, laid the foundation for the influential duplex account of high-level vision. This account of the functional organization of vision and its underlying neural substrates has had an enormous influence in the life sciences and medicine, and is now part of almost every textbook in vision, cognitive neuroscience, and psychology. In addition, his ideas have also influenced researchers working in machine vision and robotic control, as well as philosophers interested in consciousness. He is a Fellow of the Royal Society of Canada and the Royal Society of London (UK).