

Capstone Address

Parallel Processing of Form, Color, Motion, and Depth: Anatomy, Physiology, Art, and Illusion

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Seeing is much more complicated than most people realize. It is tempting to think of vision as just another way of making a picture. However, no camera or computer system can match the ability of the human visual system to make sense of an infinite variety of images. That ability is made possible by the brain's capacity to process huge amounts of information simultaneously.

Recent studies suggest that form, color, and spatial information are processed along three independent pathways in the brain. That explains why certain images can create surprising visual effects. Taking into account these characteristics of the visual system could vastly improve the perceptual quality of the display of images.

Reference

M. S. Livingstone, Art, "Illusion, and the Visual System," *Scientific American*, January 1988, 78-85.

Biographical Sketch

Margaret S. Livingstone is professor of neurobiology at the Harvard Medical School. After receiving her undergraduate degree at the Massachusetts Institute of Technology, she entered the Harvard Medical School, but she transferred to the graduate school and earned a Ph.D. there in neurobiology in 1980. Since 1979 she has collaborated with David H. Hubel of the medical school in the study of how human beings and other primates process visual information.