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RESEARCH OVERVIEW

Mechanisms of Neural Information Processing

For more information, please visit Dr. Victor's:

- Lab Home Page
- Personal Home Page What features of the activity of individual neurons and neural populations are used to represent and process information? How are unambiguous percepts generated from individual neural spike trains and the activity of neural populations? How are form, color, and motion extracted from the visual image, and how do these submodalities interact? What are realistic models for how visual information is transformed by neurons of the mammalian visual system? How does disease of the nervous system affect these processes? What are the intrinsic dynamics of networks of neurons in normal brain and in epilepsy? What are the implications for novel diagnostics and therapeutics? We are addressing these questions at multiple levels: behavior (via psychophysical studies in man), cell populations (via surface and depth evoked potentials), and at the cellular level (via single-unit recording). These experimental studies are accompanied by theoretical investigations. What are appropriate mathematical models for complex biological systems, and how can they be tested empirically? What are the general rules for how the properties of a large, complex system derive from the properties of its constituents and their connections?

Back to top ▲