Developing and Applying Biologically-Inspired Vision Systems: Interdisciplinary Concepts

PREMIER REFERENCE SOURCE

Developing and Applying Biologically-Inspired Vision Systems
Interdisciplinary Concepts

Marc Pomplun & Junichi Suzuki

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When comparing machine vision systems to the visual systems of humans and animals, there is much to be learned in terms of object segmentation, lighting invariance, and recognition of object categories. Studying the biological systems and applying the findings to the structure of computational vision models and artificial vision systems aims to be an essential approach of advancing the field of machine vision.

Developing and Applying Biologically-Inspired Vision Systems: Interdisciplinary Concepts provides interdisciplinary research which evaluates the performance of machine visual models and systems in comparison to biological systems. Blending the ideas of current scientific knowledge and biological vision, this collection of new ideas intends to inspire approaches and cross-disciplinary research to applications in machine vision.

Topics Covered:

- Behavioral Data
- Computational Models
- Human Visual System
- Neuroimaging
- Technical Applications in Vision
- Vision Systems
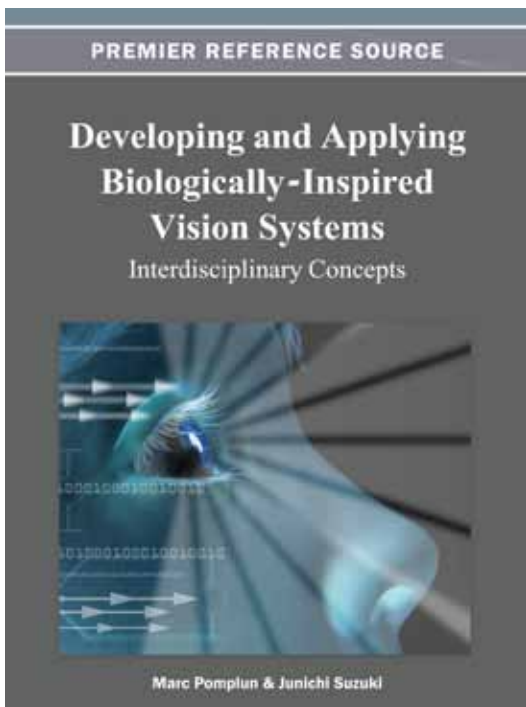
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Marc Pomplun is a Professor of Computer Science at the University of Massachusetts Boston. In 1998, he received a Ph.D. in Computer Science (Dr. rer. nat.) from Bielefeld University in Germany and the University's "Best Dissertation in 1998" award. He subsequently conducted research as a post-doctoral fellow in the Department of Psychology at the University of Toronto and as a research scientist at the Centre for Vision Research, York University, Canada. In 2002, he joined the University of Massachusetts Boston, where he founded the Visual Attention Laboratory and initiated the Talks in Cognitive Science (TICS) colloquium series. His research focuses on human vision, particularly visual attention, and how insight into biological vision can be applied to the fields of computer vision and human-computer interaction. In 2007, he received the Outstanding Achievement Award for Scholarship from the College of Science and Mathematics. By the time of his promotion to Professor in 2012, he had made more than 160 contributions to scientific journals and conferences and obtained research funding as a PI and Co-PI from the National Institutes of Health, the National Science Foundation, and the US Department of Education.

Section 1: Visual Attention

Section 2: Binocular Vision

Section 3: Visual Cortical Structures

Section 4: Artificial Vision Systems

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