

## **CALL FOR CHAPTER PROPOSALS**

**Proposal Submission Deadline: January 3, 2011**

### ***Developing and Applying Biologically-Inspired Vision Systems: Interdisciplinary Concepts***

A book edited by Dr. Marc Pomplun and Dr. Junichi Suzuki  
University of Massachusetts Boston

To be published by IGI Global: <http://www.igi-global.com/>

#### **Introduction**

While machine vision systems are becoming increasingly powerful, in most regards they are still far inferior to their biological counterparts. For instance, in terms of object segmentation, recognition of object categories, viewpoint and lighting invariance, or material recognition, much can be learned from the visual systems of humans and animals. Studying the biological systems and applying the findings to the construction of computational vision models and artificial vision systems is therefore a promising way of advancing the field of machine vision. Conversely, evaluating the performance of such models and systems in comparison to the biological systems can provide important feedback for a better understanding of the brain mechanisms underlying natural vision. Bio-inspired machine vision is thus a truly interdisciplinary research endeavor that benefits all scientific disciplines involved.

#### **Objective of the Book**

The objective of this book project is to present current scientific knowledge about vision from fields such as computer science, engineering, psychology, neuroscience, and biology to a similarly diverse audience interested in developing and applying biologically inspired technical vision systems. This interdisciplinary compilation of ideas is intended to inspire new approaches and initiate cross-disciplinary research partnerships that will lead to novel approaches and applications in machine vision as well as the study of biological vision.

#### **Target Audience**

This book will primarily address both academic and industrial researchers in fields relevant to bio-inspired machine vision, such as computer science, engineering, psychology, neuroscience, and biology. It would also be a valuable resource for graduate students who intend to start a research career.

#### **Recommended topics include, but are not limited to, the following:**

- Psychophysical, neuroimaging, EEG, or TMS studies of the human visual system that are relevant to computational vision models or machine vision applications
- Studies of vision in animals with results that apply to computational models or technical applications in vision
- Implementation and evaluation of biologically inspired components in machine vision systems
- Systematic evaluation of biologically inspired artificial vision systems and comparison of the results to behavioral or neurophysiological data

- Biologically motivated computational models of specific aspects of biological vision that are relevant to technical vision applications
- Evaluation of human or animal vision with regard to ideal observer models
- Studies of visual attention in humans or animals that may inform the implementation of attentional mechanisms in technical vision systems
- Implementation and evaluation of mechanisms of location-, feature-, or object-based attention in artificial vision systems or computational models of vision
- Construction of active vision systems with camera control inspired by human eye-movement behavior
- Applications of bio-inspired vision systems to, for example, image processing, field sensing, robotics and hardware design.

### Submission Procedure

Researchers and practitioners are invited to submit *on or before January 3, 2011*, a 2-3 page chapter proposal clearly explaining the mission and concerns of his or her proposed chapter. Authors of accepted proposals will be notified by **January 22, 2011** about the status of their proposals and sent chapter guidelines. Full chapters are expected to be submitted by **March 3, 2011**. All submitted chapters will be reviewed on a double-blind review basis. Contributors may also be requested to serve as reviewers for this project.

### Publisher

This book is scheduled to be published in 2012 by IGI Global (formerly Idea Group Inc.), publisher of the “Information Science Reference” (formerly Idea Group Reference), “Medical Information Science Reference,” “Business Science Reference,” and “Engineering Science Reference” imprints. For additional information regarding the publisher, please visit [www.igi-global.com](http://www.igi-global.com).

### Important Dates

<b>January 3, 2011:</b>	Proposal Submission Deadline
<b>January 22, 2011:</b>	Notification of Acceptance
<b>March 3, 2011:</b>	Full Chapter Submission
<b>May 18, 2011:</b>	Review Results Returned
<b>June 18, 2011:</b>	Final Chapter Submission
<b>July 15, 2011:</b>	Final Deadline

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