Vision Science Photons To Phenomenology

Eye Tracking for Visual MarketingIndirect PerceptionVision ScienceQuantum Mind and Social ScienceVisual PsychophysicsHigh-Dynamic-Range (HDR) VisionVision ScienceStructural Information TheorySeeing, Thinking and KnowingPeople and Computers XVI - Memorable Yet InvisibleSeeingColor VisionBiologically Motivated Computer VisionThe EyeSimplicity in VisionThe Origin of ConceptsAesthetic ScienceVisual IntelligenceAttention in Cognitive Systems. Theories and Systems from an Interdisciplinary ViewpointSmellosophyBiophysicsEye and brainComputational VisionComputer Vision – ECCV 2012Visual Mismatch Negativity (vMMN): a Prediction Error Signal in the Visual ModalityActive VisionSeeingAction in PerceptionVisual MarketingFoundations of PerceptionFoundations of VisionVisionReadings in Information VisualizationThe Oxford Handbook of Perceptual OrganizationThe Philosophy of PerceptionHandbook of Psychology, Experimental PsychologyGeometric Representations of Perceptual PhenomenaConcise Computer VisionEye and BrainFrom Photon to Neuron

Eye Tracking for Visual Marketing

Indirect Perception

A pioneering exploration of olfaction that upsets settled notions of how the brain translates sensory information. Decades of cognition research have shown that external stimuli "spark" neural patterns in particular regions of the brain. This has fostered a view of the brain as a space that we can map: here the brain responds to faces, there it perceives a sensation in your left hand. But it turns out that the sense of smell—only recently attracting broader attention in neuroscience—doesn't work this way. A. S. Barwich asks a deceptively simple question: What does the nose tell the brain, and how does the brain understand it? Barwich interviews experts in neuroscience, psychology, chemistry, and perfumery in an effort to understand the biological mechanics and myriad meanings of odors. She argues that it is time to stop recycling ideas based on the paradigm of vision for the olfactory system. Scents are often fickle and boundless in comparison with visual images, and they do not line up with well-defined neural regions. Although olfaction remains a puzzle, Barwich proposes that what we know suggests the brain acts not only like a map but also as a measuring device, one that senses and processes simple and complex odors. Accounting for the sense of smell upsets theories of perception philosophers have developed. In their place, Smellosophy articulates a new model for understanding how the brain represents sensory information.

Vision Science

An argument that perception is something we do, not something that happens to us: not a process in the brain, but a skillful bodily activity.

Quantum Mind and Social Science

This textbook on vision reflects the integrated computational approach of modern research scientists, combining psychological, computational and neuroscientific perspectives.

Visual Psychophysics

This comprehensive volume aims to further research and theory development in visual marketing. By bringing together leading researchers in the field, it strives to contribute to the establishment of visual marketing as a coherent discipline. The chapters represent an array of issues in visual marketing. They address three areas in theory: attention and perception, visual cognition and action and choice. The chapters go beyond what is known, and offer in many cases a more speculative and visionary account of the directions that visual marketing research could and should take. Rather than being confined to advertising only, this new volume shows how visual marketing permeates almost all consumer and marketing activities. It will be of interest to undergraduate and graduate students in marketing, management, industrial design, and consumer and social psychology. Professional practitioners, especially those involved with marketing communications, retail, and in store marketing and market research, will also benefit from the empirically based and innovative ideas put forth in this book.

High-Dynamic-Range (HDR) Vision

Perceptual organization comprises a wide range of processes such as perceptual grouping, figure-ground organization, filling-in, completion, perceptual switching, etc. Such processes are most notable in the context of shape perception but they also play a role in texture perception, lightness perception, color perception, motion perception, depth perception, etc. Perceptual organization deals with a variety of perceptual phenomena of central interest, studied from many different perspectives, including psychophysics, experimental psychology, neuropsychology, neuroimaging, neurophysiology, and computational modeling. Given its central importance in phenomenal experience, perceptual organization has also figured prominently in classic Gestalt writings on the topic, touching upon deep philosophical issues regarding mind-brain relationships and consciousness. In addition, it attracts a great deal of interest from people working in applied areas like visual art, design, architecture, music, and so forth. The Oxford Handbook of Perceptual Organization provides a broad and extensive review of the current literature, written in an accessible form for scholars and students. With chapter written by leading researchers in the field, this is the state-of-the-art reference work on this topic, and will be so for many years to

come.

Vision Science

A computational investigation into the human representation and processing of visual information.

Structural Information Theory

Seeing, Thinking and Knowing

What does it mean to have an "aesthetic" experience? In this book, philosophers, psychologists, and neuroscientists address the nature of aesthetic experiences from their own discipline's perspective. These scholars discuss whether a multidisciplinary approach, an aesthetic science, can help connect mind, brain, and aesthetics.

People and Computers XVI - Memorable Yet Invisible

A unique contribution to the understanding of social science, showing the implications of quantum physics for the nature of human society.

Seeing

Designed for students, scientists and engineers interested in learning about the core ideas of vision science, this volume brings together the broad range of data and theory accumulated in this field.

Color Vision

This first comprehensive account of high-dynamic-range (HDR) vision focuses on HDR real-time, high-speed digital video recording and also systematically presents HDR video transmission and display. While the book conveys the overall picture of HDR vision, specific knowledge of microelectronics and image processing is not required. In this book, experts share their knowledge in this rapidly evolving art related to the single most powerful of our senses.

Biologically Motivated Computer Vision

This book constitutes the refereed proceedings of the Second International Workshop on Biologically Motivated Computer Vision, BMCV 2002, held in Tübingen, Germany, in November 2002. The 22 revised full papers and 37 revised short papers presented together with 6 invited papers were carefully reviewed and selected from 97 submissions. The papers are organized in topical sections on neurons and features, motion, mid-level vision, recognition - from scenes to neurons, attention, robotics, and cognitive vision.

The Eye

Current theories of visual change detection emphasize the importance of conscious attention to detect unexpected changes in the visual environment. However, an increasing body of studies shows that the human brain is capable of detecting even small visual changes, especially if such changes violate non-conscious probabilistic expectations based on repeating experiences. In other words, our brain automatically represents statistical regularities of our visual environmental. Since the discovery of the auditory mismatch negativity (MMN) event-related potential (ERP) component, the majority of research in the field has focused on auditory deviance detection. Such automatic change detection mechanisms operate in the visual modality too, as indicated by the visual mismatch negativity (vMMN) brain potential to rare changes. VMMN is typically elicited by stimuli with infrequent (deviant) features embedded in a stream of frequent (standard) stimuli, outside the focus of attention. In this research topic we aim to present vMMN as a prediction error signal. Predictive coding theories account for phenomena such as mismatch negativity and repetition suppression, and place them in a broader context of a general theory of cortical responses. A wide range of vMMN studies has been presented in this Research Topic. Twelve articles address roughly four general sub-themes including attention, language, face processing, and psychiatric disorders. Additionally, four articles focused on particular subjects such as the oblique effect, object formation, and development and time-frequency analysis of vMMN. Furthermore, a review paper presented vMMN in a hierarchical predictive coding framework. Each paper in this Research Topic is a valuable contribution to the field of automatic visual change detection and deepens our understanding of the short term plasticity underlying predictive processes of visual perceptual learning.

Simplicity in Vision

Based on a conference held in honor of Professor Tarow Indow, this volume is organized into three major topics concerning the use of geometry in perception: * space -- referring to attempts to represent the subjective space within which we locate ourselves and perceive objects to reside; * color -- dealing with attempts to represent the structure of color percepts as revealed by various experimental procedures; and * scaling -- focusing on the organization of various bodies of data -- in

this case perceptual -- through scaling techniques, primarily multidimensional ones. These topics provide a natural organization of the work in the field, as well as one that corresponds to the major aspects of Indow's contributions. This book's goal is to provide the reader with an overview of the issues in each of the areas, and to present current results from the laboratories of leading researchers in these areas.

The Origin of Concepts

This text provides an introduction to computational aspects of early vision, in particular, color, stereo, and visual navigation. It integrates approaches from psychophysics and quantitative neurobiology, as well as theories and algorithms from machine vision and photogrammetry. When presenting mathematical material, it uses detailed verbal descriptions and illustrations to clarify complex points. The text is suitable for upper-level students in neuroscience, biology, and psychology who have basic mathematical skills and are interested in studying the mathematical modeling of perception.

Aesthetic Science

Reveals the way the human eye acts on the visual world not just to represent but to actively construct the things we see, outlining the rules of vision and their application in art and technology. Reprint.

Visual Intelligence

This new edition of a classic text offers an accessible but rigorous introduction to the computational approach to understanding biological visual systems. The authors of Seeing, taking as their premise David Marr's statement that "to understand vision by studying only neurons is like trying to understand bird flight by studying only feathers," make use of Marr's three different levels of analysis in the study of vision: the computational level, the algorithmic level, and the hardware implementation level.

Attention in Cognitive Systems. Theories and Systems from an Interdisciplinary Viewpoint

For the last 20 years the dominant form of user interface has been the Graphical User Interface (GUI) with direct manipulation. As software gets more complicated and more and more inexperienced users come into contact with computers, enticed by the World Wide Web and smaller mobile devices, new interface metaphors are required. The increasing complexity of software has introduced more options to the user. This seemingly increased control actually decreases control as the number of options and features available to them overwhelms the users and 'information overload'

can occur (Lachman, 1997). Conversational anthropomorphic interfaces provide a possible alternative to the direct manipulation metaphor. The aim of this paper is to investigate users reactions and assumptions when interacting with anthropomorphic agents. Here we consider how the level of anthropomorphism exhibited by the character and the level of interaction affects these assumptions. We compared characters of different levels of anthropomorphic abstraction, from a very abstract character to a realistic yet not human character. As more software is released for general use with anthropomorphic interfaces there seems to be no consensus of what the characters should look like and what look is more suited for different applications. Some software and research opts for realistic looking characters (for example, Haptek Inc., see http://www.haptek.com). others opt for cartoon characters (Microsoft, 1999) others opt for floating heads (Dohi & Ishizuka, 1997; Takama & Ishizuka, 1998; Koda, 1996; Koda & Maes, 1996a; Koda & Maes, 1996b).

Smellosophy

Foundations of Perception provides a comprehensive general introduction to perception. All the major and minor senses are covered, not only examining them from a perceptual perspective but also taking into account their biological and physical context. In addition to covering all material essential to understanding the functioning of the senses, each chapter also includes a 'Tutorials' section. This provides an opportunity for more advanced students to explore supplementary information on recent or controversial developments in subjects such as: The physics and biology of audition ; Shape and object perception ; Individual differences in perception.

Biophysics

This posthumous volume, the culmination of a long and distinguished career, brings together an original essay by the author together with a careful selection of previously published articles (most by Rock) on the theory that perception is an indirect process in which visual experience is derived by inference, rather than being directly and independently determined by retinal stimulation.

Eye and brain

Lambert Wiesing's The Philosophy of Perception challenges current theories of perception. Instead of attempting to understand how a subject perceives the world, Wiesing starts by taking perception to be real. He then asks what this reality means for a subject. In his original approach, the question of how human perception is possible is displaced by questions about what perception obliges us to be and do. He argues that perception requires us to be embodied, to be visible, and to continually participate in the public and physical world we perceive. Only in looking at images, he proposes, can we achieve

something like a break in participation, a temporary respite from this, one of perception's relentless demands. Wiesing's methods chart a markedly new path in contemporary perception theory. In addition to identifying common ground among diverse philosophical positions, he identifies how his own, phenomenological approach differs from those of many other philosophers, past and present. As part of the argument, he provides a succinct but comprehensive survey of the philosophy of images His original critical exposition presents scholars of phenomenology, perception and aesthetics with a new, important understanding of the old phenomenon, the human being in the world.

Computational Vision

According to Putnam to talk of "facts" without specifying the language to be used is to talk of nothing; "object" itself has many uses and as we creatively invent new uses of words "we find that we can speak of 'objects'that were not 'values of any variable'in 1 any language we previously spoke" . The notion of object becomes, then, like the notion of reference, a sort of open land, an unknown territory. The exploration of this land - pears to be constrained by use and invention. But, we may wonder, is it possible to guide invention and control use? In what way, in particular, is it possible, at the level of na- ral language, to link together program expressions and natural evolution? To give an answer to these onerous questions we should immediately point out that cognition (as well as natural language) has to be considered first of all as a peculiar fu- tion of active biosystems and that it results from complex interactions between the - ganism and its surroundings. "In the moment an organism perceives an object of wh- ever kind, it immediately begins to 'interpret'this object in order to react properly to it . . . It is not necessary for the monkey to perceive the tree in itself. . . What counts is sur- 2 vival" .

Computer Vision – ECCV 2012

A comprehensive treatment of the skills and techniques needed for visual psychophysics, from basic tools to sophisticated data analysis. Vision is one of the most active areas in biomedical research, and visual psychophysical techniques are a foundational methodology for this research enterprise. Visual psychophysics, which studies the relationship between the physical world and human behavior, is a classical field of study that has widespread applications in modern vision science. Bridging the gap between theory and practice, this textbook provides a comprehensive treatment of visual psychophysics, teaching not only basic techniques but also sophisticated data analysis methodologies and theoretical approaches. It begins with practical information about setting up a vision lab and goes on to discuss the creation, manipulation, and display of visual images; timing and integration of displays with measurements of brain activities and other relevant techniques; experimental designs; estimation of behavioral functions; and examples of psychophysics in applied and clinical settings. The book's treatment of experimental designs presents the most commonly used psychophysical paradigms, theory-driven psychophysical experiments, and the analysis of these procedures in a signal-detection theory framework. The book

discusses the theoretical underpinnings of data analysis and scientific interpretation, presenting data analysis techniques that include model fitting, model comparison, and a general framework for optimized adaptive testing methods. It includes many sample programs in Matlab with functions from Psychtoolbox, a free toolbox for real-time experimental control. Once students and researchers have mastered the material in this book, they will have the skills to apply visual psychophysics to cutting-edge vision science.

Visual Mismatch Negativity (vMMN): a Prediction Error Signal in the Visual Modality

Students in the physical and life sciences, and in engineering, need to know about the physics and biology of light. Recently, it has become increasingly clear that an understanding of the quantum nature of light is essential, both for the latest imaging technologies and to advance our knowledge of fundamental life processes, such as photosynthesis and human vision. From Photon to Neuron provides undergraduates with an accessible introduction to the physics of light and offers a unified view of a broad range of optical and biological phenomena. Along the way, this richly illustrated textbook builds the necessary background in neuroscience, photochemistry, and other disciplines, with applications to optogenetics, superresolution microscopy, the single-photon response of individual photoreceptor cells, and more. With its integrated approach, From Photon to Neuron can be used as the basis for interdisciplinary courses in physics, biophysics, sensory neuroscience, biophotonics, bioengineering, or nanotechnology. The goal is always for students to gain the fluency needed to derive every result for themselves, so the book includes a wealth of exercises, including many that guide students to create computer-based solutions. Supplementary online materials include real experimental data to use with the exercises. Assumes familiarity with first-year undergraduate physics and the corresponding math Overlaps the goals of the MCAT, which now includes data-based and statistical reasoning Advanced chapters and sections also make the book suitable for graduate courses An Instructor's Guide and illustration package is available to professors

Active Vision

More than one third of the human brain is devoted to the processes of seeing - vision is after all the main way in which we gather information about the world. But human vision is a dynamic process during which the eyes continually sample the environment. Where most books on vision consider it as a passive activity, this book is unique in focusing on vision as an 'active' process. It goes beyond most accounts of vision where the focus is on seeing, to provide an integrated account of seeing AND looking. The book starts by pointing out the weaknesses in our traditional approaches to vision and the reason we need this new approach. It then gives a thorough description of basic details of the visual and oculomotor systems necessary to understand active vision. The book goes on to show how this approach can give a new perspective on visual attention, and how the approach has progressed in the areas of visual orienting, reading, visual search, scene perception

and neuropsychology. Finally, the book summarises progress by showing how this approach sheds new light on the old problem of how we maintain perception of a stable visual world. Written by two leading vision scientists, this book will be valuable for vision researchers and psychology students, from undergraduate level upwards.

Seeing

Action in Perception

Carey begins by characterizing the innate starting point for conceptual development, namely systems of core cognition. Representations of core cognition are the output of dedicated input analyzers, as with perceptual representations, but these core representations differ from perceptual representations in having more abstract contents and richer functional roles. Carey argues that the key to understanding cognitive development lies in recognizing conceptual discontinuities in which new representational systems emerge that have more expressive power than core cognition and are also incommensurate with core cognition and other earlier representational systems. Finally, Carey fleshes out Quinian bootstrapping, a learning mechanism that has been repeatedly sketched in the literature on the history and philosophy of science. She demonstrates that Quinian bootstrapping is a major mechanism in the construction of new representational resources over the course of children's cognitive development.

Visual Marketing

This groundbreaking book defines the emerging field of information visualization and offers the first-ever collection of the classic papers of the discipline, with introductions and analytical discussions of each topic and paper. The authors' intention is to present papers that focus on the use of visualization to discover relationships, using interactive graphics to amplify thought. This book is intended for research professionals in academia and industry; new graduate students and professors who want to begin work in this burgeoning field; professionals involved in financial data analysis, statistics, and information design; scientific data managers; and professionals involved in medical, bioinformatics, and other areas. Features Full-color reproduction throughout Author power team - an exciting and timely collaboration between the field's pioneering, most-respected names The only book on Information Visualization with the depth necessary for use as a text or as a reference for the information professional Text includes the classic source papers as well as a collection of cutting edge work

Foundations of Perception

A coherent and comprehensive theory of visual pattern classification with quantitative models, verifiable predictions and extensive empirical evidence.

Foundations of Vision

This book revolutionizes how vision can be taught to undergraduate and graduate students in cognitive science, psychology, and optometry. It is the first comprehensive textbook on vision to reflect the integrated computational approach of modern research scientists. This new interdisciplinary approach, called "vision science," integrates psychological, computational, and neuroscientific perspectives. The book covers all major topics related to vision, from early neural processing of image structure in the retina to high-level visual attention, memory, imagery, and awareness. The presentation throughout is theoretically sophisticated yet requires minimal knowledge of mathematics. There is also an extensive glossary, as well as appendices on psychophysical methods, connectionist modeling, and color technology. The book will serve not only as a comprehensive textbook on vision, but also as a valuable reference for researchers in cognitive science, psychology, neuroscience, computer science, optometry, and philosophy.

Vision

Interactions between the fields of physics and biology reach back over a century, and some of the most significant developments in biology--from the discovery of DNA's structure to imaging of the human brain--have involved collaboration across this disciplinary boundary. For a new generation of physicists, the phenomena of life pose exciting challenges to physics itself, and biophysics has emerged as an important subfield of this discipline. Here, William Bialek provides the first graduate-level introduction to biophysics aimed at physics students. Bialek begins by exploring how photon counting in vision offers important lessons about the opportunities for quantitative, physics-style experiments on diverse biological phenomena. He draws from these lessons three general physical principles--the importance of noise, the need to understand the extraordinary performance of living systems without appealing to finely tuned parameters, and the critical role of the representation and flow of information in the business of life. Bialek then applies these principles to a broad range of phenomena, including the control of gene expression, perception and memory, protein folding, the mechanics of the inner ear, the dynamics of biochemical reactions, and pattern formation in developing embryos. Featuring numerous problems and exercises throughout, Biophysics emphasizes the unifying power of abstract physical principles to motivate new and novel experiments on biological systems. Covers a range of biological phenomena from the physicist's perspective Features 200 problems Draws on statistical mechanics, quantum mechanics, and related mathematical concepts Includes an annotated bibliography and detailed appendixes Instructor's manual (available only to teachers)

Readings in Information Visualization

A multidisciplinary account of human perceptual organization, with rigorous theoretical foundations, quantitative and qualitative models, and extensive empirical evidence.

The Oxford Handbook of Perceptual Organization

Healy provides an overview of basic areas of perception, learning, memory, motivation and emotion. Chapters cover other cognitive processes and special topics such as attention, decision-making, information processing, problem solving and psycholinguistics.

The Philosophy of Perception

We spend about one-tenth of our waking hours completely blind - only one percent of what we see is in focus at any one time. You don't need eyes to see - blind volunteers have been taught to see through their chests. Through a spellbinding mix of scientific research, mathematics, philosophy, history, myth, anecdote and language theory, Simon Ings brilliantly unravels the never-ending puzzle of how and why we see in the way that we do. With the help of a beguiling mix of illustrated visual conundrums and enigmas, Ings triumphs with a compelling dissection of the eye's age-old mysteries that is both seriously interesting and interestingly fun.

Handbook of Psychology, Experimental Psychology

This textbook provides an accessible general introduction to the essential topics in computer vision. Classroom-tested programming exercises and review questions are also supplied at the end of each chapter. Features: provides an introduction to the basic notation and mathematical concepts for describing an image and the key concepts for mapping an image into an image; explains the topologic and geometric basics for analysing image regions and distributions of image values and discusses identifying patterns in an image; introduces optic flow for representing dense motion and various topics in sparse motion analysis; describes special approaches for image binarization and segmentation of still images or video frames; examines the basic components of a computer vision system; reviews different techniques for vision-based 3D shape reconstruction; includes a discussion of stereo matchers and the phase-congruency model for image features; presents an introduction into classification and learning.

Geometric Representations of Perceptual Phenomena

Color Vision, first published in 2000, defines the state of knowledge about all aspects of human and primate color vision.

Concise Computer Vision

Eye-Tracking for Visual Marketing examines the structure of the eye, the visual brain, eye-movements, and methods for recording and analyzing them. It describes the authors' theory and reviews eye-tracking applications in marketing based on this theory.

Eye and Brain

The seven-volume set comprising LNCS volumes 7572-7578 constitutes the refereed proceedings of the 12th European Conference on Computer Vision, ECCV 2012, held in Florence, Italy, in October 2012. The 408 revised papers presented were carefully reviewed and selected from 1437 submissions. The papers are organized in topical sections on geometry, 2D and 3D shapes, 3D reconstruction, visual recognition and classification, visual features and image matching, visual monitoring: action and activities, models, optimisation, learning, visual tracking and image registration, photometry: lighting and colour, and image segmentation.

From Photon to Neuron

This volume provides a much-needed interdisciplinary angle on the subject of attention in cognitive systems. It constitutes the thoroughly refereed post-workshop proceedings of the 5th International Workshop on Attention in Cognitive Systems, held in Hyderabad, India, in January 2007. The 31 papers are organized in topical sections that cover every aspect of the subject, from the embodiment of attention and its cognitive control, to the applications of attentive vision.

ROMANCE ACTION & ADVENTURE MYSTERY & THRILLER BIOGRAPHIES & HISTORY CHILDREN'S YOUNG ADULT FANTASY HISTORICAL FICTION HORROR LITERARY FICTION NON-FICTION SCIENCE FICTION