20th Annual Conference
Object Perception, Attention, & Memory

November 15, 2012
Minneapolis, MN

www.opam.net

OPAM 2012 Organizers

Carly Leonard
University of California, Davis
cjleonard@ucdavis.edu

Melissa Võ
Harvard Medical School
mlvo@search.bwh.harvard.edu

Michael Mack
The University of Texas at Austin
michael.mack@utexas.edu

Josh Cosman
Vanderbilt University
joshua.d.cosman@vanderbilt.edu

Congratulations to OPAM on 20 Years

Best Wishes from the CNBC Vision Community:

Marlene Behrmann - Visual Cognition
Marlene Cohen - Population Coding
Carol Colby - Perceptual Stability
Aloysha Efros - Data-driven Scene Understanding
Martial Hebert - Recognition & Scene Understanding
Roberta Klatzky - Perception and Action
Sandra Kuhlman - Sensory Development
Tai Sing Lee - Mid-level Vision
Carl Olson - High-level Vision
David Plaut - Neural-Network Modeling
Matt Smith - Functional Circuits of Vision
Michael Tarr - Visual Cognition
Wayne Wu - Attention & Consciousness

Participating Programs:

Neural Computation @ CNBC
Biological Sciences @ CMU
Center for Neuroscience @ Pitt
Computer Science @ CMU
Machine Learning @ CMU
Psychology @ CMU & Pitt
Robotics @ CMU
Statistics @ CMU

Carnegie Mellon University

OPAM 2012 Talk Session
Minneapolis Hilton, Salon G

7:30	Registration/Breakfast	
8:15	Opening Remarks	
Lead: Melissa Võ		**Ecological perception**
8:30	Cronin & Brockmole	Reference Frames, Implied Motion, Animacy, and Gaze-Control
8:45	Meyerhoff, Huff, & Schwan	Linking perceptual animacy to visual attention: Evidence from chasing detection
9:00	Young & Cordes	Fewer things, lasting longer: The effects of emotion on quantity judgments
9:15	Caparos, Linnell, Bremner, De Fockert, & Davidoff	Does local/global perceptual bias tell us anything about local/global selective attention?
9:30	Break	
Lead: Carly Leonard		**Working memory**
9:45	Cunningham & Wolfe	Lions or tigers or bears: Oh my! Hybrid visual search for categorical targets
10:00	Rajsic & Wilson	Remembering where: Estimated memory for visual objects is better when retrieving location with colour
10:15	Bigelow & Poremba	Comparing short-term memory among sensory modalities
10:30	Break	
Lead: Josh Cosman		**Attention and decision making**
10:45	Vatterott & Vecera	The attentional window configures to object boundaries
11:00	Adamo, Cain, & Mitroff	Self-induced attentional blink: a cause of errors in multiple-target visual search
11:15	Moher & Song	Dynamic threshold adjustments reduce costly changes-of mind in perceptual-decision making
11:30	Sali, Anderson, & Yantis	Reinforcement learning modulates states of cognitive flexibility
11:45	Lunch (Posters should be up)	
12:30-2:15	**Poster Session**	**Minneapolis Convention Center, Ballroom A**
2:15	Break (Posters down by 2:30)	
Lead: Michael Mack		**Object perception and recognition**
2:30	Baruch, Kimchi, & Goldsmith	Object recognition: attention to distinguishing features
2:45	Firestone & Scholl	“Please tap the shape, anywhere you like”: An exceedingly simple measure exposes skeletal shape representations
3:00	Greene & Fei-Fei	Automatic basic-level object and scene categorization
3:15	Break	
3:30	**KEYNOTE ADRESS**	**Dr. Michael Tarr**
4:30	Awards and Closing Remarks	

OPAM 2012 Keynote Address

Salon G
Minneapolis Hilton
3:30 p.m.

Dr. Michael Tarr
Center for the Neural Basis of Cognition, Carnegie Mellon University

Twenty years in twenty slides
A brief history of vision

Sponsored by

CAMBRIDGE RESEARCH SYSTEMS

OPAM 2012 Poster Session
Minneapolis Convention Center, Ballroom A

Object processing

1. Object-object based contextual effects on object recognition
   Marcus Chen & David Andresen
2. The role of surface feature continuity in binding objects and semantic information
   Caglar Tas & Andrew Hollingworth
3. Object detection, categorization, and visual salience: You know what it is before you know something is there
   Mark Thomas & Carrick Williams
4. Contribution of semantic information to object-based attentional selection
   George Malcolm & Sarah Shomstein
5. Object-based benefits without object-based representations
   Daryl Fougnie, Sarah Cormiea, & George Alvarez
6. Visual indexes facilitate attentional processing
   Annie Tran & James Hoffman

Perceptual processing

7. Similar time course of subjective, objective and indirect measures of perception
   Ziv Peremen & Dominique Lamy
8. Hitting a miss: Limitations of signal detection theory
   Jeremy Schwark, Igor Dolgov, Joshua Sandry, & Justin MacDonald
9. The effects of stimulus density and size on symmetry detection
   Szu-Yu Chen & Hsuan-Fu Chao
10. Antipriming accompanies priming in spoken word recognition
    Katie Broadwell, Anna Schnurrer, Eric Partridge, Katrina Achamabault, Benjamin Munson, & Chad Marsolek
11. Emergent features help resolve ambiguous apparent motion
    Anna Cragin, Belicia Ding, & James Pomerantz

Face processing

12. Categorical perception of discriminating Caucasian faces along the morphed continuum of happy and fearful expressions: An ERP study
    Ming-Chuen Lee, Shih-Tseng Tina Huang, & Gary C.-W. Shyi
13. Evidence for expertise in facial symmetry assessment
    Kait Clark, Tate Jackson, & Stephen Mitroff

14. Individuals with autism spectrum disorder use configural information more than neurotypical individuals when recognizing faces
Noah Schwartz, Geneva Polser, Sarah Adams, Cory Katona, Alie Plott, Paige Daniels, Ayla Byrd, & Miranda Wood
15. Coordinate coding explains face inversion effects better than holistic processing
Jonathan Kahl, Larissa Arnold, & Eric Cooper
16. Holistic processing in matching simultaneously presented composite faces: Evidence from the Complete design
George Chao-Chih Wang & Gary C.-W. Shyi
17. Parts and wholes both contribute to visual crowding of faces
Hsin-Mei Sun & Benjamin Balas
18. People have no tendency to categorize other-race faces
Zhijie Cheng & Guomei Zhou
19. Own-race bias and eye movements: Does effort predict memory?
Anne Robinson, Carrick Williams, & Tracie Stewart
20. Perceptual processes in the cross-race effect: Evidence from eyetracking
Gerald P. McDonnell, Cindy Laub, Brian Bornstein, & Michael Dodd

Spatial processing

21. Change detection is increased by disruptions of spatial continuity
Lewis Baker & Daniel Levin
22. Reference points in spatial memory
Whitney Street & Ranxiao Frances Wang
23. Effects of spatial configurations on the resolution of spatial representations
Aysu Mutluturk & Aysecan Boduroglu
24. Not all spatial tasks illustrate dual task interfere with saccadic eye movements
Eric Blumberg, Surpreet Sachdeva, & Matthew Peterson

Visual search

25. Why is visual search so difficult when target features are instantaneous?
Nicole Jardine & Cathleen Moore
26. Small perceptual differences cause big problems when they make your “target template” imprecise
Michael Hout & Stephen Goldinder
27. Pattern-breaking pop out: Further evidence in support of the Theory of Basic Gestalts
Kimberly Orsten, Amanda Hahn, & James Pomerantz
28. Voices facilitate visual search for congruent faces
L. Jacob Zweig, Marcia Grabowecky, & Satoru Suzuki

Ecological perception and attention

29. ERP evidence for an early locus of perceptual disruption by emotional stimuli
    Briana Kennedy, Jennifer Rawding, Steven Most, & James Hoffman
30. Vision for stimuli on the hands: Introducing the body boundary hypothesis
    Eric Taylor & Jessica Witt
31. Different rotation functions for identifying objects, animals, and faces
    Larissa Arnold, Jonathan Kahl, & Eric Cooper
32. Availability of physical support decreases perceived step height in older adults
    Mila Sugovic & Jessica Witt
33. The invisible gorilla strikes again: Sustained inattentional blindness in expert observers
    Trafton Drew, Melissa Le-Hoa Võ, & Jeremy Wolfe
34. Second search same as the first: The benefits of consistency in multiple target search for professional and non-professional visual searchers
    Adam Biggs, Stephen Mitroff
35. The relationship between aesthetic choice, values and looking time during a visual aesthetic decision task
    Eve Isham, Rachel Gwinn, & Joy Geng

Selective attention

36. Exact temporal locus of visual distraction
    Ricardo Max & Yehoshua Tsal
37. Electrophysiological evidence for automatic word recognition in a Stroop Task
    Jae Hyung Han, Han Shin Kim, & Yang Seok Cho
38. Awareness of one's own name under high attentional load
    Szu-Hung Lin & Yei-Yu Yeh
39. Perceptual load and perceptual grouping modulate the attentional allocation to peripheral distractor: an event-related potentials study
    Shao-Ming Lee & Yei-Yu Yeh

Capture and cognitive control

40. The content in visual working memory automatically captures visual attention
    Sunghyun Kim, Han Shin Kim, & Yang Seok Cho
41. Different tags in working memory influence working memory-driven attentional capture
    Chun-Yu Kuo, Hsuan-Fu Chao, & Yei-Yu Yeh
42. Impaired proactive cognitive control in action video game players
    Kara Blacker & Kim Curby
43. Multiple attentional control settings established on a trial-by-trial basis
    Zachary Roper & Shaun Vecera

44. Effect of target-distractor similarity on top-down attention effect in visual search with salient distractor
Kao Yamaoka & Chikashi Michimata

45. Task-switching delayed responses with natural images in RSVP
Stephane Buffat, Charles-antoine Salasc, Justin Platier, & Jean Lorenceau

Visual memory

46. The duration for top-down control to enhance color-shape bound representations
Kuan-Yao Huang & Yei-Yu Yeh

47. Assessment of object processing in visual short-term memories
Melissa Trevino, Bruno Breitmeyer, & Jane Jacob

48. Within-category visual similarity differentially predicts working memory for abstract categories and specific exemplars of unfamiliar objects
Brianna Morseth, E. Darcy Burgund, & Chad Marsolek

49. The reliance on ensemble statistics in visual working memory varies according to the availability of item memory
Seongmin Hwang & Andrew Hollingworth

50. Resource sharing between iconic and post-iconic processing
Jane Jacob, Shon MonDragon, & Bruno Breitmeyer

51. Autistic personality traits and visual memory resolution
Lauren Richmond, Elizabeth Klobusicky, & Ingrid Olson

Remembering and forgetting

52. Memory for size vs. memory for relative size
Pamela Glosson & John Hummel

53. Smothered by the scene: When context interferes with memory for objects
Karla Evans & Jeremy Wolfe

54. I guess you had to be there: Episodic as well as semantic information organizes visual memory
Karla Antonelli & Carrick Williams

55. The effect of interpolated testing on directed forgetting
Jessica LaPaglia & Jason Chan

56. Boundary extension in children vs. adults: What developmental differences may tell us about scene representation
Erica Kreindel & Helene Intraub

57. A new “twist” on boundary extension: We falsely remember more surrounding space when the world is upside-down
Steve Beighley & Helene Intraub

58. Reconsolidation in human episodic memory
Keely Burke, Jessica LaPaglia, & Jason Chan

Maps and Floorplans

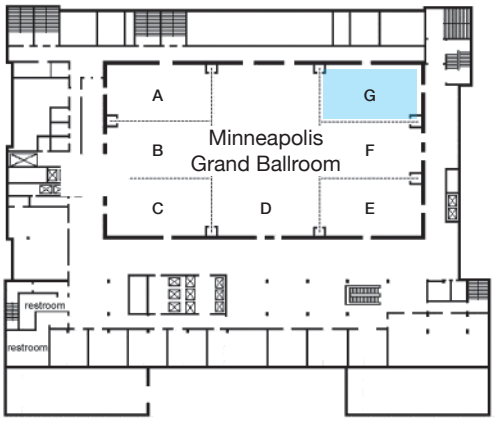
OPAM Talks

Hilton Minneapolis

Third Floor

Salon G

Hilton Minneapolis - Third Floor



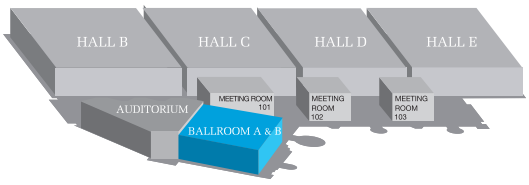
OPAM Posters

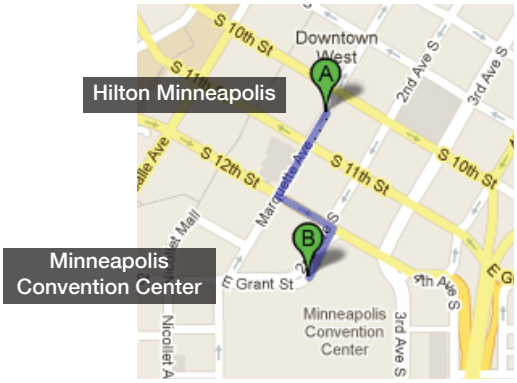
Minneapolis
Convention Center

Level One

Ballroom A

Minneapolis Convention Center Level One





Ecological Perception

8:30 AM – 8:45 AM

Reference frames, implied motion, animacy, and gaze-control

Deborah Cronin[1] & James Brockmole[2]
[1]University of Illinois at Urbana-Champaign, [2]University of Notre Dame

Previous research shows that object level semantics of a scene influence the allocation of attention. We investigated the influence of spatial orientation, implied motion, and perceived animacy on gaze. Eye movements directed away from a fixated object were biased in the direction it faced. This effect was stronger if an object implied a particular direction of motion. Animate motion, did not increase this bias over inanimate motion. These findings extend and restrict effects associated with reference frames and motion on covert attention to overt gaze control decisions and add to our understand of how object semantics influence gaze.

8:45 AM – 9:00 AM

Linking perceptual animacy to visual attention: Evidence from chasing detection

Hauke Meyerhoff[1], Markus Huff[2], & Stephan Schwan[1]
[1]Knowledge Media Research Center, [2]Univeristy of Tuebingen

We present variants of the chasing detection paradigm in order to investigate how attention contributes to the detection of animate motion. We show that chasing detection performance decreases with larger set sizes (i.e., no pop-out, Experiments 1a and 1b). Instead, we observed the 2:1 ratio for search slopes of target-absent and target-present trials that indicate effortful visual searches (Experiment 2). Furthermore, chasing detection is less efficient than the detection of identically colored pairs of objects (Experiment 3). Overall, these results show that chasing detection requires an effortful visual search through subsets of all possible items.

9:00 AM – 9:15 AM

Fewer things, lasting longer: The effects of emotion on quantity judgments

Laura Young & Sara Cordes
Boston College

Using temporal and numeric bisection tasks, we examined the effects of emotional stimuli (angry and happy faces, neutral face controls) on time and number perception. Each participant also completed baseline temporal and numeric bisection tasks without emotional stimuli. As in previous studies, durations were overestimated following angry faces relative to neutral, consistent with arousal-modulated time perception theories. In contrast, numerosities were underestimated following both emotional faces relative to neutral. In addition, processing of time and number were found to have no relationship within subjects. Results suggest separate cognitive systems for time and number that are differentially influenced by emotion.

9:15 AM – 9:30 AM

Does local/global perceptual bias tell us anything about local/global selective attention?

Serge Caparos, Karina Linnell, Andrew Bremner, Jan De Fockert, & Jules Davidoff
Goldsmiths, University of London

A local perceptual bias has been linked to a lesser ability to attend globally. We examined this proposed link in a remote population, the Himba, who have demonstrated a strong local bias compared to British observers. If local perceptual bias is related to a lesser ability to attend globally, the Himba should be less distracted by global information in a local-selection task but more distracted by local information in a global-selection task. However, they performed better than British in both local- and global-selection tasks. Local/global perceptual bias must therefore be distinguished from local/global selective attention.

Working Memory

9:45 AM – 10:00 AM

Lions or tigers or bears: Oh my! Hybrid visual search for categorical targets

Corbin Cunningham[1] & Jeremy Wolfe[2]
[1]Johns Hopkins University, [2]Harvard Medical School

In many real world visual search tasks, we search for any of several targets (Are any of my Facebook friends at this party?). Such tasks are "hybrid" visual and memory searches. Wolfe (2012) found that RTs in hybrid tasks increase linearly with the visual set size but logarithmically with the memory set size. What would happen if observers were asked to search for a set of categories rather than several specific objects? Would we still find that RTs increase logarithmically as memory set sizes increase? Answer: Search is much slower but RTs still increase logarithmically with memory set size.

10:00 AM – 10:15 AM

Remembering where: Estimated memory for visual objects is better when retrieving location with colour

Jason Rajsic & Daryl Wilson
Queen's University

The present experiment investigated whether the estimation of an item's presence in visual short-term memory (VSTM), using the Mixture Modeling approach of Zhang and Luck (2008), differs by cue and recall features. Participants viewed 1, 3, 5, or 7 colored circles for 100 ms. After a 900ms delay, participants reproduced the color of an item by its location, or its location using its color. Results from the two conditions differed critically in both estimated precision of memory and probability of an item's presence in memory. These results draw attention to the need characterize retrieval processes in VSTM

10:15 AM – 10:30 AM

Comparing short-term memory among sensory modalities

James Bigelow & Amy Poremba
University of Iowa

Does short-term retention capability depend on the sensory modality in which it is encoded? To address this question, we compared performance on a short-term memory task using simple auditory, visual, and tactile stimuli that were matched in duration and discriminability. At very short retention intervals (1-2 s), accuracy was equal among sensory modalities. However, for longer retention intervals (4-32 s), auditory memory was inferior to visual and tactile memory. These data suggest that short-term memory is not processed in a modality-independent manner, but may depend on the unique characteristics of each sensory processing pathway.

Attention and decision making

10:45 AM – 11:00 AM

The attentional window configures to object boundaries

Daniel Vatterott & Shaun Vecera
University of Iowa

The attentional window hypothesis asserts that capture is determined by whether or not salient events occur within the spatial distribution of observers' attentional window. One unanswered question is whether the attentional window can configure to objects or, instead, if it acts as a simple zoom-lens. To answer this, observers completed the additional singleton paradigm and were either cued to locations or an object. All color singletons captured attention when locations were cued. When objects were cued, only color singletons on the cued object captured attention suggesting that the attentional window is not a simple zoom-lens and can configure to objects.

11:00 AM – 11:15 AM

Self-induced attentional blink: a cause of errors in multiple visual search

Stephen Adamo, Matthew Cain, & Stephen Mitroff
Duke University

Multiple-target visual searches, wherein more than one target can be present simultaneously, are especially error-prone with a decrease in second target accuracy after a first has already been found in a display. This phenomenon, known as Satisfaction of Search (SOS), presents a dangerous problem for many real-world searches, yet much is unknown about its cognitive underpinnings. We examined SOS errors in relation to another phenomenon that has been extensively studied: the Attentional Blink (AB). Surprisingly, despite obvious paradigm differences (e.g., self-paced vs. experimentally-timed) we found that an attentional blink can underlie SOS errors.

11:15 AM – 11:30 AM

Dynamic threshold adjustments reduce costly changes-of mind in perceptual-decision making

Jeff Moher & Joo-Hyun Song
Brown University

We are faced with various decision-making issues ranging from simple perceptual decisions to complex social decisions. To examine whether action costs are integrated into perceptual decision-making processes, we varied angular separation between two choice reach targets corresponding to the perceived motion direction of dots. As target separation increased, energy costs required for implementing changes-of-mind into action also increased. Thus, curved reach trajectories initially directed towards one choice and then changed to the other were less frequently observed. This indicates that perceptual decision thresholds for changes-of-mind are dynamically adjusted to integrate potential motor-related costs.

11:30 AM – 11:45 AM

Reinforcement learning modulates states of cognitive flexibility

Anthony W. Sali, Brian A. Anderson, & Steven Yantis
Johns Hopkins University

Adaptive cognitive control involves switching and maintaining cognitive operations in accordance with task demands. Given previous findings that reward learning gives rise to persistent attentional biases (Anderson, Laurent, & Yantis, 2011, PNAS), we examined the role of reward learning on context-specific modulations of an individual's readiness to perform a cognitive switch (cognitive flexibility). Reinforcement learning modulated participants' preparation to perform a shift of spatial attention or switch task set. A subsequent experiment using a novel decision-making paradigm revealed that reward history also modulates individuals' readiness to switch behavioral strategies and that these learned strategies transfer to novel contexts.

Object perception and recognition

2:30 PM – 2:45 PM

Object recognition: attention to distinguishing features

Orit Baruch, Ruth Kimchi & Morris Goldsmith
University of Haifa

We examined two hypotheses regarding the role of attention in object recognition: (1) In the course of object recognition attention is directed to distinguishing features—those features that are diagnostic of object identity in a particular context. (2) Top-down attention to distinguishing features can compete with and ultimately override bottom-up attentional capture by salient non-distinguishing features. Observers performed a recognition task with artificial fish and differences in the allocation of attention to distinguishing and non-distinguishing features were examined using primed-matching, visual probe, and spatial cuing methods. The results supported the hypotheses, demonstrating the crucial role of attention to distinguishing features in object recognition.

2:45 PM – 3:00 PM

"Please tap the shape, anywhere you like": An exceedingly simple measure exposes skeletal shape representations

Chaz Firestone & Brian Scholl
Yale University

To be recognized across viewing conditions, shapes must be flexibly encoded. One solution favored in computer vision describes shapes according to symmetry-based 'skeletons'. Here, 7 experiments expose skeletal shape representations in human perception in an unusually direct way: when thousands of subjects touched a shape anywhere they pleased, the aggregated touches formed medial-axis skeletons. This held across many shape classes and revealed several new properties of skeletal representations—including profound sensitivity to border perturbations but not to surface features. Further results confirm that the phenomenon reflects shape representation per se, offering a window onto otherwise-hidden visual processes.

3:00 PM – 3:15 PM

Automatic basic-level object and scene categorization

Michelle Greene & Li Fei-Fei
Stanford University

Visual categorization is remarkably fast for human observers, leading to the suggestion that it may be an automatic process. We tested this hypothesis by presenting observers with a modified Stroop paradigm in which object or scene terms were presented over images of objects or scenes. Terms were either congruent or incongruent with the images. Observers classified the words as being object or scene terms while ignoring images. Classifying a word on an incongruent image came at a cost for both objects (81ms) and scenes (36ms), suggesting that basic-level categorization is an automatic and obligatory process.

Object Processing

1. Object-object based contextual effects on object recognition

Marcus Chen & David Andresen
University of Puget Sound

The present study investigated the role of context on object recognition. Objects were presented in either related or unrelated contexts. Using a change-detection paradigm, participants were asked whether or not identities changed between two subsequently presented object groups. Reaction time analysis indicates that participants took less time to detect changes when objects were unrelated and no changes when the objects were related. D-prime analysis showed that participants detected changes more accurately when the objects shown were related. These results indicate that context facilitates change detection accuracy, but incurs some cognitive cost on the speed of processing.

2. The role of surface feature continuity in binding objects and semantic information

Caglar Tas & Andrew Hollingworth
University of Iowa

We examined the role of surface features in mapping complex objects and events across occlusion. Participants saw cartoon animals, whose appearance coincided with stated factual information. The animal “burrowed” to a new location, and participants were asked about a fact. We manipulated animals’ surface features from one appearance to the next, while keeping spatiotemporal information consistent. During test, both locations where the animal appeared were fixated equally often when surface features indicated a single animal. When they suggested two animals, the animals original locations were fixated more. These data indicate that surface features are consulted to map objects across occlusion.

3. Object detection, categorization, and visual salience: You know what it is before you know something is there

Mark Thomas & Carrick Williams
Mississippi State University

Perceptual categorization involves integrating bottom-up sensory information with top-down knowledge. Bottom-up information comes from the external world and visual saliency is a type of bottom-up information that is calculated on the differences between the visual characteristics of adjacent spatial locations. The present study investigated the effects of visual saliency on object detection and categorization. Importantly, the results indicated that so-called ‘object detection’ is not a valid construct. Rather than identifying objectness prior to categorization, object categorization is an obligatory process, and object detection is a postcategorization decision with higher salience objects being categorized easier than lower salience objects.

4. Contribution of semantic information to object-based attentional selection.

George Malcolm & Sarah Shomstein
The George Washington University

Object based attention has been extensively studied with simple shapes, but the effect of semantic information (i.e., real-world objects) on attentional selection has yet to be understood. In a series of experiments utilizing behavioral and eye-movement measures, we used real-world objects and manipulated features and semantic information. Participants located targets faster if they were on different objects than on equidistant locations within the same, spatially cued objects. RTs on the same object were slowest when the two objects had a semantic relationship. Objects containing semantic information reveal a more complex contribution of objects to attentional guidance.

5. Object-based benefits without object-based representations

Daryl Fougnie, Sarah Cormiea, & George Alvarez
Harvard University

Influential theories of visual working memory have proposed that the basic units of memory are integrated object representations. Key support for this proposal is provided by the 'same object benefit': it is easier to remember multiple features of a single object than the same set of features distributed across multiple objects. Here we replicate the object benefit, but demonstrate that features are not stored as single, integrated representations. These results rule out the possibility that integrated representations drive the object benefit, and require a revision of the concept of object-based memory representations.

6. Visual indexes facilitate attentional processing

Annie Tran & James Hoffman
University of Delaware

Sears and Pylyshyn (2000) proposed that observers track multiple objects by assigning pointers to the targets. These pointers provide visual attention quick access to tracked objects. Sears and Pylyshyn supported this theory by showing that observers were faster in identifying form changes occurring on targets compared to distractors. However, observers' fixation was not controlled in these experiments. These fixations would offer an advantage in identifying target changes independent of visual attention. The current experiments replicated these results using an eye tracker to ensure that observers maintained fixation. Our results support several predictions of the Sears and Pylyshyn visual indexing theory.

Perceptual Processing

7. Similar time course of subjective, objective and indirect measures of perception

Ziv Peremen & Dominique Lamy
Tel Aviv University

Visual awareness is measured using either subjective or objective reports, whereas unconscious processing is measured using either objective reports or indirect measures of perception. Whether these three measures of perception reflect quantitatively or qualitatively different processes remains controversial. The objective of the present study was to determine whether these measures are differentially affected by SOA in a metacontrast study, under similar task demands. We found unconscious processing when the masked stimulus visibility was null, but SOAs affected all three measures in the same way, suggesting that all these measures tap the same mechanism with different degrees of sensitivity.

8. Hitting a miss: Limitations of signal detection theory

Jeremy Schwark, Igor Dolgov, Joshua Sandry, & Justin MacDonald
New Mexico State University

Recent visual search studies show that an observer's perception of the task can affect their performance on the task. This raises the important question of whether signal detection theory (SDT) can properly account for this observer behavior. The current study found that in some conditions, participants reach a quitting threshold and report the presence of a target they did not detect. A SDT analysis on these "hits" reveals patterns of sensitivity change not typically found in the literature. The authors suggest that reaction times may be used to assess the accuracy of conclusions drawn from SDT.

9. The effects of stimulus density and size on symmetry detection

Szu-Yu Chen & Hsuan-Fu Chao
Chung Yuan Christian University

Symmetry detection is an axis-based attentional process that extracts significant stimuli and groups them to symmetry structure. Huang, Pashler, and Junge (2004) found that symmetry detection was affected by density but not size. Therefore, this study aimed at investigating the effects of stimulus density and size on symmetry detection. Results from three experiments showed that detectability of symmetry increased as complexity rose, regardless what the stimulus size is. In addition, the detectability increased as stimulus size enlarged only when the density was not low. Theoretical implications regarding symmetry discussion were discussed.

10. Antipriming accompanies priming in spoken word recognition

Katie Broadwell[1], Anna Schnurrer[1], Eric Partridge[2], Katrina Achamabault[1], Benjamin Munson[1], & Chad Marsolek[1]
[1]University of Minnesota, [2]University of Rochester

In visual object and visual word identification, antipriming is a phenomenon that accompanies repetition priming. In particular, identifying one set of objects or words has the effect of both (a) enhancing subsequent identification of the same set of objects or words (repetition priming) and (b) impairing subsequent identification of a different set of objects or words (antipriming). How generalizable is this finding? Our aim was to determine whether antipriming accompanies priming in auditory word identification. Relative to a baseline condition, we found a weak effect of antipriming and a strong effect of repetition priming, helping to generalize antipriming to audition.

11. Emergent features help resolve ambiguous apparent motion

Anna Cragin, Belicia Ding, & James Pomerantz
Rice University

What is the role of grouping in solving the correspondence problem in apparent motion? We used a Ternus display to display either element or group motion by varying the figures inscribed within horizontally aligned disks; we tested participants' ability to discriminate between the two types of motion. Emergent Features (ex., parallelism, intersections) have been shown to be diagnostic of grouping; hence, extent of grouping was varied by the figures containing varying numbers of EFs. When good configurations were present, participants were better able to discriminate between element and group motion, suggesting the importance of grouping in solving the correspondence problem.

Face Processing

12. Categorical perception of discriminating Caucasian faces along the morphed continuum of happy and fearful expressions: An ERP study

Ming-Chuen Lee, Shih-Tseng Tina Huang, & Gary C.-W. Shyi
National Chung-Cheng University

Categorical perception entails superior between-category discrimination to within-category discrimination on stimuli with identical physical differences. We examined categorical perception along morphed continuum of happy and fearful expressions among Caucasian faces while measuring ERPs. Peak amplitudes of both P120 and N170 at PO8 of the second face in a sequentially presented pair were higher than those of the first face. P3 at both Cz and Pz were found higher in the between-category condition than those in the same and within-category conditions. These findings suggested both central and parietal activations are related to perceptual categorization of facial expressions.

13. Evidence for expertise in facial symmetry assessment

Kait Clark[1], Tate Jackson[2], Stephen Mitroff[1]
[1]Duke University, [2]University of North Carolina at Chapel Hill

Evaluating symmetry is an important element of face processing and contributes to judgments about attractiveness, healthiness, and mate selection. Although general face processing in healthy adult humans is well studied, less is known about whether symmetry assessment is a universally equal skill across all humans. Here we reveal that a particular group of individuals, orthodontists, have an advanced ability to assess facial symmetry. The practice of orthodontics involves assessing the symmetry of faces, and the observed benefits here likely arise from the fact that orthodontists are specifically trained to evaluate and improve facial symmetry.

14. Individuals with autism spectrum disorder use configural information more than neurotypical individuals when recognizing faces

Noah Schwartz, Geneva Polser, Sarah Adams, Cory Katona, Alie Plott, Paige Daniels, Ayla Byrd, Miranda Wood
Christopher Newport University

Individuals with Autism Spectrum Disorder (ASD) show impaired recognition of faces and facial expressions. Face recognition deficits are believed to result from a lack of configural/holistic processing and a shift toward feature-based recognition strategies. Using a face recognition paradigm that controls for individual differences in task difficulty, we show that high ASD individuals use configural information more than neurotypical individuals,

relying on nose- and mouth-related distances more than other dimensions. These results suggest that high ASD individuals will outperform neurotypical observers when recognizing faces in which nose- and mouth-related distances are diagnostic of identity.

15. Coordinate coding explains face inversion effects better than holistic processing

Jonathan Kahl, Larissa Arnold, & Eric Cooper
Iowa State University

Tanaka and Farah (1993) argue that the face inversion effect is a consequence of the disruption of a holistic representation that does not decompose a face into parts. In the current experiments, participants had to decide whether two faces or houses that had different numbers of features present were identical, both when they were inverted and when they were upright. Reliable inversion effects were found for partial faces suggesting that the face inversion effect does not require a whole face to occur. Inversion effects were found for houses as well provided that the houses shared the same structural description.

16. Holistic processing in matching simultaneously presented composite faces: Evidence from the Complete design

George Chao-Chih Wang & Gary C.-W. Shyi
Department of Psychology, Center for Research in Cognitive Science and Advanced Institute of Manufacturing with High-tech Innovations (AIM-HI), National Chung Cheng University, Taiwan

There have been many studies supported two theoretically opposing views of face processing, namely the domain-specificity hypothesis versus the expertise hypothesis. At the heart of the debate concerns the nature of holistic processing, its antecedents as well as its consequences. In others words, holistic processing has been regarded as one of the core processes underlying face recognition, and for many researchers the key ingredient for distinguishing face processing from object processing (Mckone & Robbins, 2007; McKone, 2010). However, one aspect regarding holistic processing that has not been addressed adequately concerns the time course of holistic processing. Many previous studies have focused holistic processing in the post-perceptual and memory stages, and little research has examined the perceptual stage of holistic processing without memory retrieval. We think it necessary to understand holistic processing and its underlying mechanism in different phases of face recognition, especially the perceptual phase. Otherwise, we can't conclude with certainty at which stage holistic processing takes place.

17. Parts and wholes both contribute to visual crowding of faces

Hsin-Mei Sun & Benjamin Balas
Department of Psychology, North Dakota State University

In three experiments, we examined how face parts and global face configurations contribute to visual crowding. Participants performed a gender categorization task in which a target face was either presented alone or surrounded by flankers, which could be Chinese characters (Experiments 1-3), line-drawn faces (Experiment 1), face-like electrical sockets (Experiment 2), or scrambled faces (Experiment 3). We observed stronger crowding when target faces were surrounded by any face-like stimulus relative to Chinese characters. The results suggest that crowding occurs at multiple levels of visual processing, spanning local (part-based) and global (configural) representations of face appearance.

18. People have no tendency to categorize other-race faces

Zhijie Cheng & Guomei Zhou
Sun Yat-sen University

Levin (2000) has found a faster detection of other-race faces among own-races faces than that of own-race faces among other-race faces, which was regarded as an evidence that people have tendency to categorize other-race faces. Experiment 1 replicated the result. However, the other-race advantage was not observed in Experiment 2 which used scrambled ambiguous-race faces as distractors, and in Experiment 3 with animal faces as distractors. This result demonstrates that it is the distracters, not categorization tendency to other race faces, that results in the other-race advantage in Levin (2000).

19. Own-race bias and eye movements: Does effort predict memory?

Anne Robinson[1], Carrick Williams[1], Tracie Stewart[2]
[1]Mississippi State University, [2]University of Mississippi

We examined the own-race bias effect and its relationship to eye movements using the face inversion effect. African American and Caucasian participants studied African American and Caucasian faces while their eye movements were monitored, followed by a memory test. We found both an own-race bias and a face inversion effect, but there was no interaction. In addition, similar to Goldinger, He, and Papesh (2009), we found that effort (measured by distance the eyes traveled) was predictive of memory, but we failed to find that effort was predictive of the own-race bias in face memory.

20. Perceptual processes in the cross-race effect: Evidence from eyetracking

Gerald P. McDonnell[1], Cindy Laub[2], Brian Bornstein[1], & Michael Dodd[1]
[1]University of Nebraska-Lincoln, [2]Safety Office, City and County of Denver

The Cross-Race Effect (CRE) is the tendency to exhibit increased recognition accuracy for own-race relative to other-race faces. The present study examined whether this effect is attributable to differential perceptual encoding of own-race faces. In Experiment 1 we recorded eye movements of White participants to determine which patterns of encoding were most highly correlated with recognition accuracy. In Experiment 2, participants were instructed to fixate the features most related to accuracy in E1, leading to a reduction in CRE. These findings hold promise for understanding the mechanisms that underlie CRE and how to reduce the bias.

Spatial Processing

21. Change detection is increased by disruptions of spatial continuity

Lewis Baker & Daniel Levin
Vanderbilt University

Researchers have tested the maintenance of perceptual continuity in inconsistent scenes, but few have explored the consequences of discontinuity. Two experiments investigated the effect of spatial discontinuities on visual awareness using change detection. Discontinuities were created by violating the 180° rule, a filmmaking convention for maintaining spatial continuity. Participants viewed a single edited film that included a 180° violation, a property change, or both simultaneously. Visual changes were significantly more likely to be detected when they co-occurred with a disruption of spatial continuity. Results suggest that perceptual discontinuity may induce a general scene recoding resulting in increased change detection.

22. Reference points in spatial memory

Whitney Street & Ranxiao Frances Wang
University of Illinois

Reference systems require a reference point in addition to a reference direction to encode location of objects. The present studies used a new paradigm to test three types of reference points based on potential interference between the encoded and transformed representations. Participants studied virtual object arrays and judged the direction of one object relative another. Results provided evidence for both self and the center of the array as reference points in spatial memory, and reject the pure object-to-object (intrinsic) relationship models.

23. Effects of spatial configurations on the resolution of spatial representations

Aysu Mutluturk & Aysecan Boduroglu
Bogazici University

It is known that configural cues at retrieval help memory for spatial locations. We investigated the effects of configural cues on spatial representation resolution. To measure spatial resolution, participants were asked to locate a previously studied target while configural cues were manipulated at retrieval. Precision of locations was impaired by the configural disruption at retrieval; and the effect of configural disruption was significantly more than that of any other type of change. We argue that participants may be using available configural cues in conjunction with represented summary statistics of the original display in the precise computation of an individual location.

24. Not all spatial tasks illustrate dual task interfere with saccadic eye movements

Eric Blumberg, Surpreet Sachdeva, & Matthew Peterson
George Mason University

Research by Irwin and colleagues has demonstrated that the execution of saccades interfere with spatial tasks, such as mental rotation or left-right judgments of orientation. In the experiments reported here, participants performed a task while executing a short or long saccade. Like Irwin and Brockmole (2004), we found that saccade length affected response times when making a left-right judgment. However, we found saccade length had no effect when performing spatial or object working memory recall tasks. We conclude that saccadic interference is not due to their spatial nature, but rather that saccades interfere with active cognitive remapping.

Visual Search

25. Why is visual search so difficult when target features are instantaneous?

Nicole Jardine & Cathleen Moore
University of Iowa

In standard visual search, people detect targets among distractors in static displays. But real-world search is often performed in dynamic scenes, in which objects change positions or features over time. Here we examined performance when objects have static or dynamic orientations. In standard categorical search for a tilted bar among non-tilted distractors presented for 200 ms, we examine why accuracy was high for the static display alone, but was near chance when the same display was part of a sequence of changing orientations. Representational updating may drive this detriment.

26. Small perceptual differences cause big problems when they make your "target template" imprecise

Michael Hout & Stephen Goldinger
Arizona State University

In two experiments, we systematically varied the precision of searchers' target "templates" during visual search. In Exp1, people searched for a single target, and on a minority of "critical" trials, the item that appeared in the search display was different than its original cue (e.g., two visually similar coffee mugs). In Exp2, people were shown two cue targets (e.g., two different lamps), and were told to find one of them. We found that template imprecision strongly affects search performance: RTs are greatly slowed when the target deviates from its cue, or when multiple potential targets are dissimilar.

27. Pattern-breaking pop out: Further evidence in support of the Theory of Basic Gestalts

Kimberly Orsten, Amanda Hahn, & James Pomerantz
Rice University

False Pop Out (FPO) occurs when a distractor seems to pose as a target in visual search tasks whose displays contain a singleton target among homogenous distractors. Here we extend previous FPO studies and suggest that both conventional and false pop out result when one item – a singleton or not – breaks a pattern in the display. Using displays abundant in emergent features (starburst, octagon, and 3-in-a-row patterns), we find that items breaking a display's Gestalts (e.g. symmetry) tend to pop out over and above unique items, a finding predicted by the Theory of Basic Gestalt.

28. Voices facilitate visual search for congruent faces

L. Jacob Zweig, Marcia Grabowecky, & Satoru Suzuki
Northwestern University

Voices provide rich information important for individuation and social interaction. Voices facilitate recognition of an individual; however, it is unclear whether this facilitation is because the voice cues the location of the face. The present study demonstrates that a voice signal facilitates visual processing of an associated face, in the absence of spatial information about the face. We trained participants to make novel face/voice associations, and subsequently demonstrated that a centrally presented voice speeded visual search to the associated face. We suggest that audiovisual integration may facilitate visual processing and detection by increasing the salience of target faces.

Ecological Perception and Attention

29. ERP evidence for an early locus of perceptual disruption by emotional stimuli

Briana Kennedy[1], Jennifer Rawding[2], Steven Most[1,3], & James Hoffman[1]
[1]University of Delaware, [2]University of Notre Dame, [3]University of New South Wales

Emotion-induced blindness (EIB) refers to disrupted awareness for items that appear soon after an irrelevant emotionally arousing stimulus. This effect is phenomenally similar to the attentional blink (AB) which has been postulated to reflect a relatively late-stage processing disruption, reflected by the P300 component of the event-related brain potential (ERP). In contrast, we found that the P300 was unaffected in EIB, which was instead associated with suppression of earlier components elicited by the target. These results suggest an early, perceptual disruption in EIB, and that EIB and AB may reflect different underlying mechanisms

30. Vision for stimuli on the hands: Introducing the body boundary hypothesis

Eric Taylor[1] & Jessica Witt[2]
[1]Purdue University, [2]Colorado State University

Recently, studies have begun to show how attention operates different in the space near the hands, an effect that is thought to assist action. In this presentation, we get even closer to the body and describe findings from studies investigating perception for stimuli on the hands themselves. We describe an effect of delayed orienting to or from the hands, indicating that stimuli on the hands are attended to differently than stimuli in peri-hand space. We describe differently instances of this effect and discuss its potential role in the guidance of action

31. Different rotation functions for identifying objects, animals, and faces

Larissa Arnold, Jonathan Kahl, & Eric Cooper
Iowa State University

The purpose of the current research was to determine if the functions for identifying faces, animals, and objects rotated in the picture plane were parallel to one another. In two experiments, participants had to identify rotated objects, animals, and faces. In both experiments, faces showed a much steeper rotation function than either animals or objects while the rotation functions for animals and objects were relatively flat. The results suggest that the representation used to identify faces is more sensitive to rotation than the representation used to identify either objects or animals.

32. Availability of physical support decreases perceived step height in older adults

Mila Sugovic[1] & Jessica Witt[2]
[1]Purdue University, [2]Colorado State University

According to the action-specific perception account, a person's action ability influences spatial perception. We examined the effect of support on perceived step height in older adults. Older adults perceived steps to be lower when support was present versus absent. In younger adults, there was no difference in perceived step height between the two conditions. Furthermore, when support had no functional relevance for older adults in the act of sitting, support had no effect on perceived height. Results suggest that the perceptual system is selectively sensitive to environmental characteristics that serve a functional role to modify action abilities.

33. The invisible gorilla strikes again: Sustained inattentional blindness in expert observers

Trafton Drew, Melissa Le-Hoa Võ, & Jeremy Wolfe
Harvard University, Brigham & Women's Hospital

We asked 24 radiologists to perform a familiar lung nodule detection task. A gorilla, 95 times larger than the average nodule, was inserted in the last case. 83% of radiologists did not see the gorilla. Even expert searchers, operating in their domain of expertise, are vulnerable to "inattentional blindness".

34. Second search same as the first: The benefits of consistency in multiple target search for professional and non-professional visual searchers

Adam Biggs, Stephen Mitroff
Duke University

Real world visual search is a complicated process subject to a variety of unavoidable pressures. As such,

increasing accuracy in critical searches (e.g., baggage screening) cannot always be done by improving the situation, and so improvement must come from the searcher. Here we demonstrate that consistency in search completion can predict accuracy in multiple-target search for professional (TSA Officers) and nonprofessional searchers. Participants were more likely to miss a second target after finding a first, but increased consistency reduced this likelihood and increased overall accuracy. Nicely, consistency offers a trainable mechanism to improve performance.

35. The relationship between aesthetic choice, values and looking time during a visual aesthetic decision task

Eve Isham, Rachel Gwinn, & Joy Geng
University of California, Davis

Is the aesthetic experience of visual art hard-wired and therefore unchanging? A critical test is to observe whether aesthetic values could be modulated. In three experiments, participants assigned values to novel objects and/or performed a binary-choice aesthetic decision while their eye movements were being recorded. Behaviorally, the results showed that values assigned to the chosen and not-chosen item were higher and lower, respectively, than their respective baseline values. Further, fixation durations were correlated with choice, but did not vary with values. Our findings implicate malleability in aesthetic values which is not represented by saccade fixation duration.

Selective Attention

36. Exact temporal locus of visual distraction

Ricardo Max & Yehoshua Tsal
Tel Aviv University

All theoretical interpretations of selective visual processing must assume a specific temporal locus during which distractors are processed. Major debates boil down to opposing poles concerning these assumptions. Yet, direct assessments of the temporal locus of distractor processing has been largely neglected. We introduce the Mutations paradigm, which followed a simplified Flanker task with the addition of distractors that mutated once during each trial. Mutations randomly occurred at different times. Results clearly indicate that distractor processing occurs exclusively during the first ~50 ms following onset. Late selection, neurofunctional single-process models and perceptual load theory cannot account for these patterns.

37. Electrophysiological evidence for automatic word recognition in a Stroop Task

Jae Hyung Han, Han Shin Kim, & Yang Seok Cho
Korea University

Stroop interference was investigated with event related potential components, N2 and N2pc, to verify the automaticity of word recognition and the role of visual attention. To vary the degree of conflict, the presence of a neutral word with a color patch and a color word was manipulated. N2 had a larger amplitude on incongruent than congruent trials when no neutral word was presented but the opposite pattern was obtained when a neutral word was presented. N2pc indicates that attentional allocation was modulated by the meanings of the two words. The findings indicate that word recognition occurred in a parallel way.

38. Awareness of one's own name under high attentional load

Szu-Hung Lin & Yei-Yu Yeh
National Taiwan University

Previous studies using visual presentation on testing the attentional capture effect of our own name under high attentional load have shown inconsistent results. The inconsistent findings between these studies may have arisen from the location where a name was presented in a display. Current study used an inattentional blindness paradigm to investigate the role of stimulus location in the name-capture effect when attentional load is high. The results showed that the participants detected their own names more often when it was presented at center than in the periphery. Own name was special when it was at the stage center.

39. Perceptual load and perceptual grouping modulate the attentional allocation to peripheral distractor: an event-related potentials study

Shao-Ming Lee & Yei-Yu Yeh
National Taiwan University

Electrophysiological activities were monitored while participants performed a flanker task under low load, high load, and dilution conditions. Target-nontarget feature similarity was low in the low-load condition and was high in the latter two conditions. In the dilution condition, target and distractor shared the same color to reduce target processing load. The results showed that distractor-elicited N2pc was observed in all three conditions. Distractor-elicited N2pc was greater under dilution than low-load which in turn was greater than under high load. Both perceptual load and perceptual grouping modulated attentional allocation to a peripheral distractor.

Capture and Cognitive Control

40. The content in visual working memory automatically captures visual attention

Sunghyun Kim, Han Shin Kim, & Yang Seok Cho
Korea University

A salient singleton sharing the content representation in visual working memory can automatically capture attention (memory-based attentional capture), suggesting that the visual working memory and visual attention share some processes. However, some studies suggest that the capture is not automatic, but voluntary strategy. The present study used a pre-cuing paradigm to prevent participants adapting a voluntary strategy of attending the memory-matching item. Three experiments showed that color as well as shape contents in visual working memory automatically captured visual attention, supporting a tight coupling between visual working memory and visual attention.

41. Different tags in working memory influence working memory-driven attentional capture

Chun-Yu Kuo, Hsuan-Fu Chao, & Yei-Yu Yeh
National Taiwan University

Recent studies have demonstrated that working memory captures attention. However, whether the items stored in working memory for different task goals capture attention remains unresolved. The present study investigated how the information maintained in working memory for different task goals influence attentional allocation. The results suggested that the capturing effect is influenced by the tags associated with the items stored in working memory. When the items are tagged as a target (a facilitatory tag), they capture attention as a default tendency; and when they are tagged as a distractor (an inhibitory tag), strategic control can modulate the capturing effect.

42. Impaired proactive cognitive control in action video game players

Kara Blacker[1] & Kim Curby[2]
[1]Temple University, [2]Macquarie University

Although a growing body of literature suggests that extensive experience playing action video games enhances visual cognitive skills, there may also be some costs that result from video gaming. Specifically, one study has illustrated that action video game players have decreased proactive cognitive control. The current study sought to examine the relationship between the amount of action gaming experience and this observed decrement in proactive cognitive control. The findings highlight the importance of elucidating both the potential benefits and costs associated with extensive video game experience.

43. Multiple attentional control settings established on a trial-by-trial basis

Zachary Roper & Shaun Vecera
University of Iowa

Recent work investigating attentional control settings has indicated that observers are capable of maintaining multiple target sets or templates. However, because these studies have employed experiment-wide target sets that allow observers to exercise multiple control settings across trials, the flexibility of these control settings remains unclear. In the current study, we examined whether observers could use multiple control settings on a trial-by-trial basis, by utilizing a variant of the attentional blink task. Consistent with the hypothesis that observers flexibly use multiple attentional control settings, cue-colored distractors captured observers' attention more often than did other singleton distractors.

44. Effect of target-distractor similarity on top-down attention effect in visual search with salient distractor

Kao Yamaoka & Chikashi Michimata
Sophia University

Participants searched for a low-saliency target (Experiment 1) or a high-saliency target (Experiment 2) among diamond distractors, and responded to the direction of the line segment inside. The distractors consisted of one irrelevant singleton. On 80% of the trials, target appeared on the expected side of the display. Present results showed that response times did not differ between the expected and non-expected sides in Experiment 1 but there was a tendency of top-down attention effect in Experiment 2, suggesting that the saliency of a target plays an important role in visual search with irrelevant singleton.

45. Task-switching delayed responses with natural images in RSVP

Stephane Buffat[1], Charles-antoine Salasc[1], Justin Platier[1], & Jean Lorenceau[2]
[1]Institut de recherché Biomedicale des Armees, [2]CNRS-CRICM-UPMC

This study investigates task switching with natural images in a rapid serial visual presentation. One condition required switching between a semantic and a physical attribute. The other condition was to switch from one physical attribute to another. We replicated the classical task switching cost, but the effect was smaller than previously reported. We found no difference between switch conditions. This result shows that task switching cost does not depend on the nature of the task sets. However, a delayed response seems to limit the task switching cost, more in accordance with the interference theory than the reconfiguration theory.

Visual Memory

46. The duration for top-down control to enhance color-shape bound representations

Kuan-Yao Huang & Yei-Yu Yeh
National Taiwan University

Visual working memory (VWM) is found volatile and subject to interference from subsequent visual inputs, and the fragility was severe in feature bindings. Prior research testing top-down modulation of VWM of color-location bindings has shown that an interval of 700 ms between retro-cueing and test array benefited memory whereas a short interval of 100 ms did not. The current study manipulated the cue-to-test interval to investigate the time course for top-down control to modulate color-shape bound representations. Preliminary data showed that an interval of 700 ms can lead to memory enhancement.

47. Assessment of object processing in visual short-term memories

Melissa Trevino, Bruno Breitmeyer, & Jane Jacob
University of Houston

A priming task not relying on working memory and a prime-probe comparison task relying on working memory were used to examine the processing of form or else color in visual memories. While priming effects tended to increase as SOA separating prime from probe increased from 0 to 200 ms, comparison effects were greatest at an SOA of 0ms, attained a minimum at an SOA of 133 ms and a secondary maximum at an SOA of 480 ms before again declining. These results indicate an early stage of visuosensory/iconic and later stages of post-iconic processing.

48. Within-category visual similarity differentially predicts working memory for abstract categories and specific exemplars of unfamiliar objects

Brianna Morseth[1], E. Darcy Burgund[1], & Chad Marsolek[2]
[1]Macalaster College, [2]University of Minnesota

Previous work suggests that dissociable neural substrates underlie working memory for abstract categories and specific exemplars of unfamiliar objects. Dissociable substrates may be necessary because bringing together visually dissimilar inputs to store abstract categories and teasing apart visually similar inputs to store specific exemplars require contradictory processes. We tested whether ratings of within-category similarity for to-be-remembered objects differentially predicted abstract and specific working memory. Results revealed increased performance with increased similarity during an abstract task and increased performance with decreased similarity during a specific task, helping to explain why dissociable substrates underlie abstract and specific working memory.

49. The reliance on ensemble statistics in visual working memory varies according to the availability of item memory

Seongmin Hwang & Andrew Hollingworth
University of Iowa

We investigated how visual working memory for the size of individual objects is modulated by a representation of ensemble statistics. The probability of encoding size information from individual items was manipulated. As the probability of individual item memory increased, biases toward the mean size of the set were minimized. Furthermore, biases were eliminated when removing trials on which participants simply reported the mean size directly. These findings indicate that ensemble statistics do not necessarily influence memory for individual items. Biases are observed only in the absence of individual item memory and are likely to reflect a guessing strategy.

50. Resource sharing between iconic and post-iconic processing

Jane Jacob, Shon MonDragon & Bruno Breitmeyer
University of Houston

A dual-task paradigm was used to examine how maintaining variable-load color or location information in working-memory interacted with the transfer of information from iconic to post-iconic levels of processing. Results indicate mutual interference between WM and iconic-readout performances. Results also revealed two stages of transfer from iconic to post-iconic levels of processing: 1) a rapid readout from iconic store, susceptible to interference from a concurrent WM task followed by 2) a slower consolidation into WM that is not susceptible to the same concurrent task.

51. Autistic personality traits and visual memory resolution

Lauren Richmond, Elizabeth Klobusicky, & Ingrid Olson
Temple University

We previously found that autistic personality traits in the general population had quixotic effects on visual short-term memory (VSTM) performance. Greater attention to detail was associated with improved performance, while high social dysfunction was associated with reduced performance [1]. Here, we asked whether autistic traits affect the resolution of items held in VSTM. Normal college-aged participants completed a color memory resolution task and several questionnaires aimed at assessing sub-clinical autistic traits. Higher levels of social dysfunction predicted poorer resolution, whereas measures of detail-oriented attention did not predict performance.

Remembering and Forgetting

52. Memory for size vs. memory for relative size

Pamela Glosson & John Hummel
University of Illinois

In two experiments, subjects judged the size difference between one shape (or the relative size of two shapes) in memory and one shape (or pair os shapes) appearing on the screen. We predicted that given long enough exposure, memory for relative size would be longer-lasting than memory for size, but with short exposure durations, memory for size would be more accurate. Surprisingly, we found memory for the relative size of two objects is more robust to decay than memory for the size of one object, and it is more accurate at even very short exposure durations.

53. Smothered by the scene: When context interferes with memory for objects

Karla Evans & Jeremy Wolfe
Harvard Medical School, Brigham & Women's Hospital

How tightly are object representations in our memory bound to scene context? Arbitrary objects, presented in isolation are remembered very well (d= 2.27). When memorizing the same objects embedded but clearly marked in a scene, performance suffers (d'=1.40). If observers learn objects in one scene and are tested with another scene, performance dropped further (d'=0.65) even though scene contexts were irrelevant. Negative effects of scene context were more pronounced during encoding (d'=0.64) than retrieval (d'=1.34). These findings suggest that scene encoding is obligatory in a manner that disrupts object recognition memory.

54. I guess you had to be there: Episodic as well as semantic information organizes visual memory

Karla Antonelli & Carrick Williams
Mississippi State University

Retroactive interference (RI) is found for object visual memory when additional conceptually-related objects are viewed but can be eliminated when encoding task emphasizes other information, indicating that RI effects may rely on both semantic and episodic information. We tested memory and RI effects by manipulating the number of interference objects either matching both an experimentally-defined category and the basic semantic category, or matching only the basic semantic category. No additional interference effect was found with the addition of objects which matched only semantically, indicating visual memory information may be represented using both semantic and episodic component.

55. The Effect of interpolated testing on directed forgetting

Jessica LaPaglia & Jason Chan
Iowa State University

In a list-method directed forgetting paradigm, participants study a list of words and are then told to either forget or remember those words. They are then shown another word list. Afterwards, participants are asked to recall all of the words they have studied. Directed forgetting results in a cost (fewer words recalled from List 1) and a benefit (greater recall of List 2 words). In the current study, the forget/remember instruction was preceded by a recall test. We found that this interpolated test eliminated the costs of directed forgetting, but the benefits to List 2 recall were maintained.

56. Boundary extension in children vs. adults: What developmental differences may tell us about scene representation

Erica Kreindel & Helene Intraub
University of Delaware

Adults remember seeing beyond the boundaries of a view (boundary extension; Intraub & Richardson, 1989). In conducting 3 experiments using free recall (drawings), a new recognition-test procedure [2-Alternative Forced Choice (AFC) task], and a guessing-game (modified 2AFC task), we found that preschool children exhibit boundary extension similar to adults. We demonstrated that, like adults, children's tendency to select a wider-angle scene after viewing a close-up view, was not due to a bias for smaller objects. Children's spatial representation of a view appears to include a broader spatial context than visible during study, much like adults.

57. A new "twist" on boundary extension: We falsely remember more surrounding space when the world is upside-down

Steve Beighley & Helene Intraub
University of Delaware

Boundary extension (BE; false memory beyond a view) can occur across a saccade. Does this rapid error depend on an upright frame of reference? Each briefly-presented upright or inverted photo (125ms) was followed by a 250-ms mask and immediate BE test (identical view & orientation). Both orientations yielded BE; but surprisingly, inversion yielded even more. When presentation and test orientation mismatched, the same occurred, suggesting that differential processing had occurred at input (not test). Results are discussed in the context of a spatial model of scene perception in which visual information is but one of several sources of information.

58. Reconsolidation in human episodic memory

Keely Burke, Jessica LaPaglia, & Jason Chan
Iowa State University

Studies examining reconsolidation of memory have become popular in recent years; however, very few have used human subjects. The current study examined whether reconsolidation occurs in human episodic memory. Over three sessions separated by 24 hours, participants watched a video (session 1), took a recall test (or not) and heard some misinformation (session 2), and completed a recognition test (session 3). The study took place over three sessions to ensure complete consolidation of the information presented in each session. We found that when memory was tested prior to misinformation exposure, accuracy on the final test was reduced.

Notes

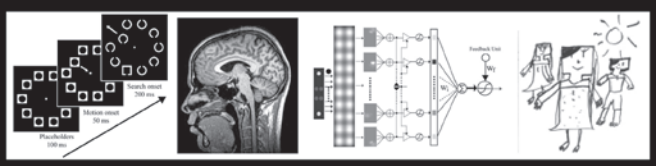
THE OHIO STATE UNIVERSITY

Department of Psychology
Cognitive Program

Explore human cognition with advanced techniques and state of the art facilities

- Computational Modeling
- fMRI
- EEG
- Eye-Tracking
- Physiological Measures

www.psy.ohio-state.edu/programs/cognitive



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

1867

The Department of Psychology
is a proud sponsor of
OPAM 2012.

For more information
about our department,
visit us at:

http://www.psychology.illinois.edu/

Tools for Functional Imaging

CAMBRIDGE RESEARCH SYSTEMS

MRI compatible LCD displays

MRI compatible eye tracking

fNiRS imaging

MRI compatible response boxes

MRI compatible audio

www.crsltd.com

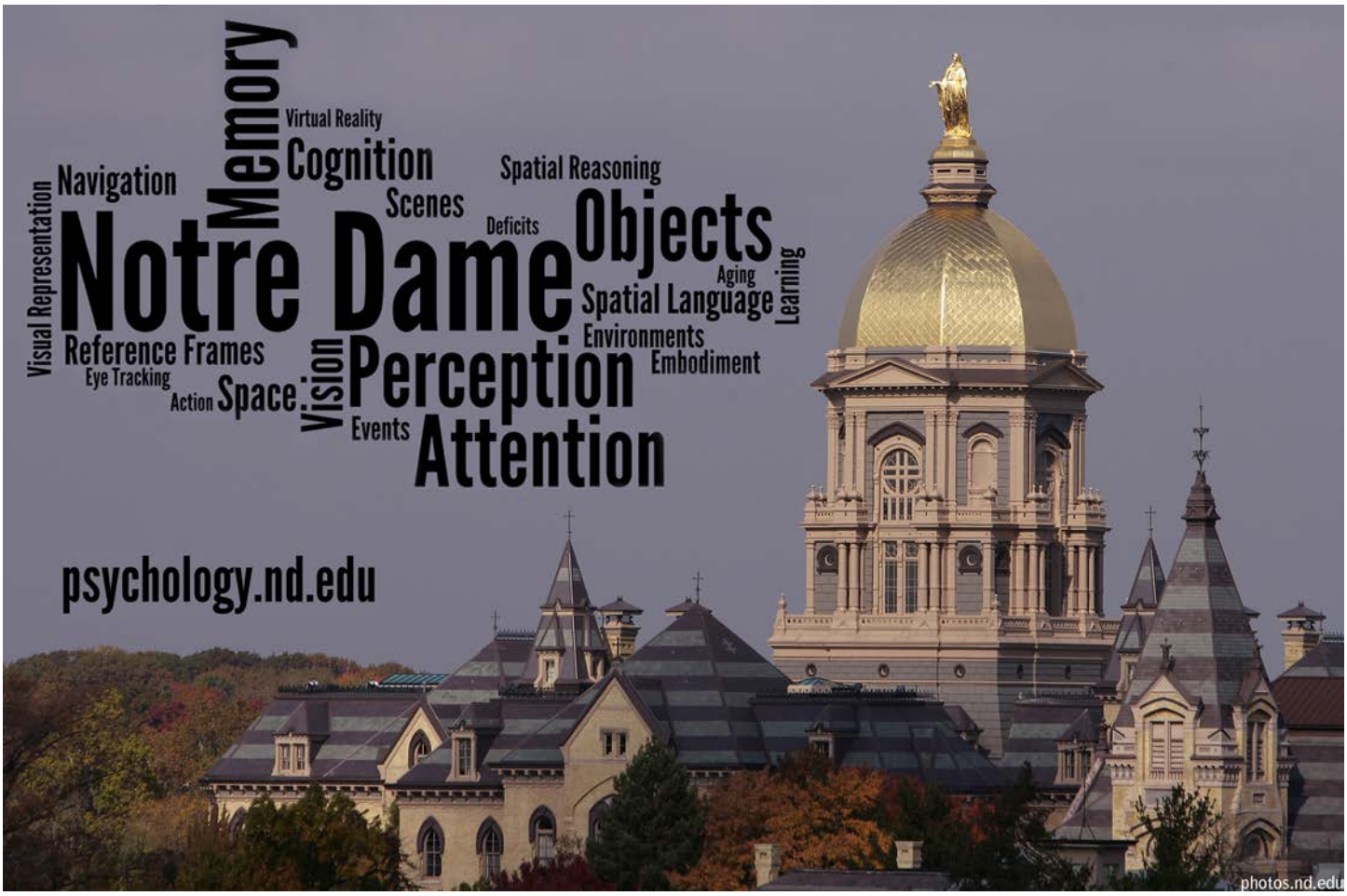
For more information contact Cambridge Research Systems:

Tel: +44 1634 720 707

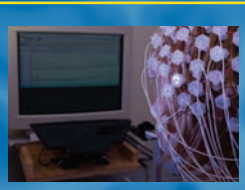
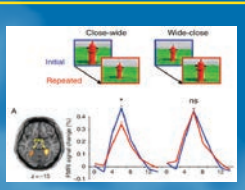
USA: 1-866-846-2929

Email: enquiries@crsltd.com

Proud sponsors of OPAM



UNIVERSITY OF DELAWARE

The Cognitive Program in the Department of Psychology at the University of Delaware provides research training in several core areas of cognition, particularly spatial cognition. A variety of cognitive neuroscience approaches are represented including cognitive neuropsychology, ERP, TMS, fMRI, and eye movement recording.

Faculty:

James E. Hoffman • Visual attention, attention and eye movements, ERP, emotion and attention

Helene Intraub • Scene perception and memory, spatial representation (vision and touch), view integration and eye movements

Jared Medina • Body representations, spatial representations, neglect, TMS, cognitive neuropsychology

Anna Papafragou • Language acquisition and processing, spatial representation, cross-linguistic differences in spatial processing

Paul C. Quinn • Perceptual organization, categorization, spatial representation, face processing, and their emergence during infancy

Timothy Vickery • Cognitive neuroscience of visual attention, perception, learning, decision-making and reward using fMRI and behavioral methods

For more information please visit out website: www.psych.udel.edu

The University of Iowa

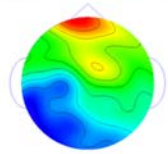
Graduate studies in Object Perception, Attention, and Memory

in the Department of Psychology

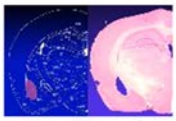
http://www.psychology.uiowa.edu/opam/

University of South Carolina

Doctoral Program in Experimental Psychology



Our program is committed to promoting excellence and productivity in research and graduate training. We are actively recruiting students in the areas of:



- Behavioral Neuroscience
- Cognitive Psychology
- Cognitive Neuroscience
- Developmental Psychology
- Quantitative Psychology

Please Contact us for More information or Visit Us on the Web

Phone: (803)777-2312

www.psych.sc.edu/grad_psycexp/expprog.html

Microsoft **Studios**

Xbox

Kinect

Studios User Research at Microsoft Studios has been pioneering the adaptation of usability and psychological testing to the entertainment software field. Our mission is to improve games with consumer feedback using controlled research methods.

Windows 8

Windows Phone

Select

Contact: erivera@microsoft.com

http://mgsuserresearch.com

ViewPoint EyeTracker ®

Scene Systems

Light weight and comfortable the eye tracking system can be worn without discomfort for long periods. View real-time gaze or recorded AVI 2.0 movies with gaze point shown clearly over the scene video. Easily adjustable in size and compatable with glasses.

* **Compatable with glasses**
* **Binocular version includes correction for parallax error**
* **The lightest weight at less than 25g**
* **No head tracker is required**
* **No beam splitter**
* **Fits any face**

Wireless !

Binocular SceneCamera

Real-time digital wireless data with Eye & Scene Video

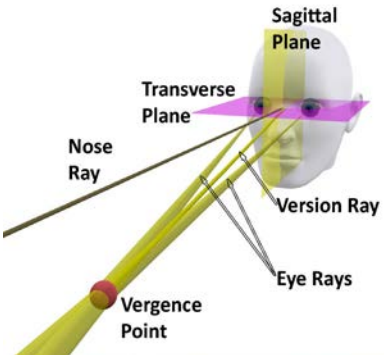
Problems Solved -

Parallax errors and frame torsion errors are real problems with monocular systems. *ViewPoint* binocular systems eliminate these problems providing accuracy over the entire range of distance.

400 Hz USB

HeadLock™ & Remote

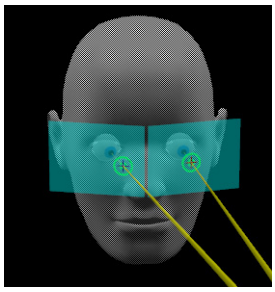
3DViewPoint™



* **Vergence & Version Angles**
* **3D Scan Paths**
* **Fast & Easy Setup**
* **Intuitive 3D Graphics**
* **Post-hoc ROI Specifications**
* **Torsion across 3D Gaze**
* **Heat, Fog and Torch Maps**
* **Polygon/Concave ROI**
* **Angular Calculations**
* **Quanternion Transforms**

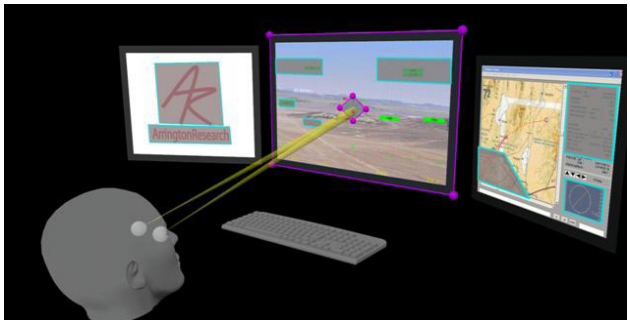
HMD Systems

Leading integrator of HMD eye tracking systems. We can design for any HMD.

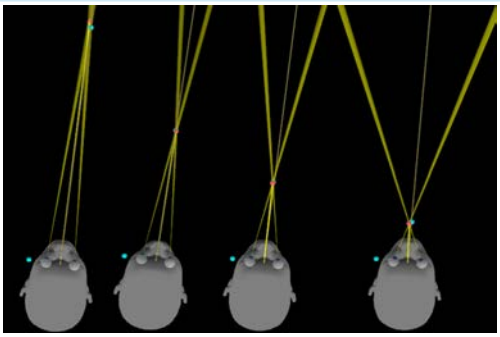


* **Canted / Tilted Displays**
* **Full or Partial Binocular Overlap**
* **See-thru or Opaque Displays**

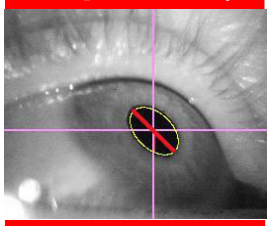
3DWorkSpace™



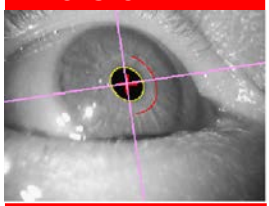
New *3DWorkSpace*™ and *3DViewPoint*™ provide precise 3D depth information for 3D monitors, gaze across multiple monitors and curved displays.



Pupilometry



Torsion



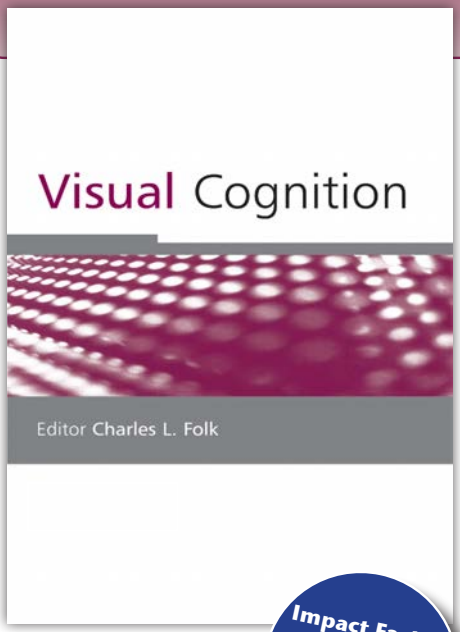
Interfaces

ArringtonResearch

www.ArringtonResearch.com 1.480-985-5810

May 31, 2012 © Arrington Research, Inc.

Visual Cognition – **OPAM Conference Report FREE Online**



Visual Cognition is the proud publisher of the **Object Perception, Attention, and Memory (OPAM) 2012 Conference Report 20th Annual Meeting,** Minneapolis, MN, USA:

http://bit.ly/OPAM2012

PLUS! 2011 OPAM Report & Research Articles Free Online

The complete Proceedings of last year's OPAM conference are also available to read absolutely free at the journal's website: **http://bit.ly/OPAM2011**

New Writers Wanted!

Have you got an idea for a *Visual Cognition* article? If so, we want to see it!

New articles should be submitted through the journal's ScholarOne Manuscripts site at: **http://mc.manuscriptcentral.com/pvis**.

Prior to submission, please click the 'Authors and submissions' tab in the left-hand menu bar on the journal's website, and read the 'Instructions for authors': **www.tandfonline/pvis**

Impact Factor: 2.049* - up 12% on last year!

NEW EDITOR 2012:
Charles L. Folk, Villanova University, USA

*©2012 Thomson Reuters, 2011 *Journal Citation Reports*®

Routledge
Taylor & Francis Group

The Vision Sciences Group
of Johns Hopkins University

Visit this website

Meet our team at www.jhu.vg

Why Use Several Different Eye Trackers

When You Can Have Several in One?

EyeLink 1000

EyeLink 1000 is an easy to use eye tracking system that can be set up in several different configurations, including 2000 Hz head supported, 500 Hz Remote (Head Free), and now 1000 Hz for MEG / MRI use.

Key Specifications

	Head Supported	Remote (Head Free)
Sampling Rate	2000 Hz Monocular 1000 Hz Binocular	500 Hz Monocular
Average Accuracy	down to 0.15º (0.25º - 0.5º typical)	down to 0.25º (0.5º typical)
Resolution	0.01º RMS micro-saccade resolution of 0.05º	0.05º RMS saccade resolution of 0.25º
Participant Setup	Very simple and easy: Typically 2-5 minutes.	

Mounting Options

The EyeLink 1000 consists of a core base system that can be used with five different mounting options, providing the ultimate in system extensionality.

Desktop

Our most popular mount: easy to transport, no electronics near the participant's head. Supports high speed head supported and remote (head free) recording modes. Binocular or monocular tracking.

Tower

Provides an increased eye tracking range compared to the other mounts. Also useful when participant is using a touch screen. Monocular eye tracking.

LCD Arm

A modified Desktop mount affixed to a 17" LCD monitor and flexible LCD arm.

Long Range

For MEG and MRI use. Supports distances between 60 and 150 cm.

Primate

Useful in non-human primate research environments where hardware is mounted to primate chair.

SR Research also provides the most flexible, graphically based, Experiment Building software; completely integrated with the EyeLink 1000 eye tracking platform.

Camera Upgrades

The custom designed high speed EyeLink 1000 camera can be upgraded in three different ways, further extending the systems high end specifications and usage options.

Remote (Head Free)

Remote (Head Free)
Allows the EyeLink 1000 system with Desktop or LCD Arm mounts to be used.

2000 Hz

Provides a 2000 Hz monocular sampling rate and a 1000 Hz binocular sampling rate when used with mounting options that support binocular tracking. Provides the best real-time sample access delays.

Fiber Optic

Upgrades the standard EyeLink 1000 camera to the miniature Fiber Optic camera head. Ideal for MEG, MRI, and EEG applications.

SR Research
EyeLink®

SR Research
Complete Eye Tracking Solutions
www.sr-research.com

EyeLink and the EyeLink logo are registered trademarks of SR Research Ltd., Mississauga Canada
©2011 SR Research Ltd. All rights reserved