**Jeremy M. Wolfe**
**Professor of Ophthalmology and Radiology**
**Harvard Medical School**

**Office Address:**
Visual Attention Lab
Brigham & Women's Hospital
65 Landsdowne St, 4th floor
Cambridge, MA 02139 USA

**Telephone**: 617-768-8818

**email:** jwolfe@bwh.harvard.edu
**URL**:search.bwh.harvard.edu
Linked-in: https://www.linkedin.com/in/jewolfe/
Facebook: https://www.facebook.com/jeremy.m.wolfe

**Education:**

| | | |
|---|---|---|
| 1977 | A.B.(summa cum laude) | Princeton University |
| 1981 | Ph.D. (Psychology) | MIT |

Doctoral Thesis: *On Binocular Single Vision*, advisor: Richard Held

**Academic Appointments:**

| | |
|---|---|
| 2010 to present | Professor of Radiology, Harvard Medical School |
| 2003 to present | Faculty Affiliate, Division of Sleep Medicine, Harvard Medical School |
| 2002 to present | Professor of Ophthalmology (with tenure), Harvard Medical School |
| 1991 - 2002 | Associate Professor of Ophthalmology, Harvard Medical School |
| 1988 - 1991 | Class of 1922 Associate Professor, Massachusetts Institute of Technology |
| 1987 - 1991 | Associate Professor, Brain and Cognitive Sciences, Massachusetts Institute of Technology |
| 1983 - 1987 | Assistant Professor, Department of Psychology/Brain and Cognitive Sciences, Massachusetts Institute of Technology |
| 1981 - 1983 | Lecturer, Department of Psychology, Massachusetts Institute of Technology |

**Hospital Appointments:**

| | |
|---|---|
| 2010 to 2017 (?)* | Director, Center for Advanced Medical Imaging (CAMI), Brigham and Women's Hospital/Radiology |

| | |
|---|---|
| 2010 to present | Director, Visual Attention Lab, Brigham and Women's Hospital/Surgery |
| 1991 - 2010 | Director of Psychophysical Studies, Center for Clinical Cataract Research, Brigham and Women's Hospital/Surgery |
| 1991 to present | Psychophysicist, Brigham and Women's Hospital/Surgery |

**Other Appointments:**

| | |
|---|---|
| 2018 - | Visiting Professor in Medical Radiation Sciences within the Faculty of Health Sciences, U. Sydney, Australia |
| 2011 - 2014(?)* | Adjunct Professor, Center for Computational Neuroscience and Neural Technology, Boston University |
| 2002 - 2014(?)* | Senior Lecturer, MIT, Department of Brain & Cognitive Science |
| 2011 - 2014 | Honorary Professor, University of Sydney (Australia), Faculty of Health Sciences |
| 2003 - 2011 | Adjunct Professor, Boston University, Center for Neural Systems |
| 1993 - 2003 | Adjunct Associate Professor, Boston University, Center for Neural Systems |
| 1993 - 1994 | Visiting Associate Professor, Brown University, Department of Cognitive Science |
| 1991 - 2002 | Visiting Associate Professor, MIT, Department of Brain & Cognitive Science |
| 1991 - 1992 | Visiting Associate Professor, Wellesley College, Department of Psychology |

* Not entirely clear when the appointment ended

**Honors and Awards:**

2019 Elected to American Academy of Arts and Sciences
2011 Keynote Address, Asian Conference on Visual Perception (Hong Kong)
2011 Fellow of the American Psychological Association (Division 21)
2010 Keynote Address, Association for Psychological Science
2009 Fellow of the Eastern Psychological Association
2009 Distinguished Scientific Contribution, New England Psychological Association
2003 Honorary Masters of Arts, Harvard University
2002 Fellow of American Association for the Advancement of Science (AAAS)
2002 Fellow of the American Psychological Society
2002 Fellow of the American Psychological Association (Division 1)
2001 Elected to Society of Experimental Psychologists
1997 Fellow of the American Psychological Association (Division 3)
1995 Fellow of the American Psychological Association (Division 6)
1989 Baker Memorial Prize for Undergraduate Teaching, Massachusetts Institute of Technology
1988 Class of 1922 Professorship, Massachusetts Institute of Technology
1977 Phi Beta Kappa, Princeton University
1977 Summa Cum Laude, Princeton University

**Professional Leadership:**

| | |
|---|---|
| 2015-2019 | Board Member, Vision Sciences Society |
| 2014-2019 | President-Elect, President, Past-President of the Federation of Associations in Behavioral & Brain Sciences (FABBS) |
| 2010-2019 | Board Member, Federation of Associations in Behavioral & Brain Sciences (FABBS) |
| 2013-2015 | Psychonomic Society: Chair 2014; Chair-Elect 2013; |
| 2010-2015 | Psychonomic Society: Governing Board 2010-2015; Finance Committee 2010-2011; Membership Committee 2011-2013; Communication Committee 2013- present, Nomination Committee, 2015 |
| 1997-2011 | American Psychological Association (APA): President of Division 3, 2010-2011; Member of the Executive Committee and Program Committee Chair for Division 3 in 2008, for Division 1 in 2004, for Division 6 in 1997-1998 |
| 1988-2002 | Eastern Psychological Association: President 2001-2002; Board of Directors 1996-1999; Program Committee 1988-1991 |

**Editorial Boards:**

| | |
|---|---|
| 2018-2020 | Treisman Special Issue Editor, Attention, Perception and Psychophysics |
| 2015 – | Founding Editor, Cognitive Research: Principles and Implications |
| 2015 | Editor for the 2015 issue of Policy Insights from Behavioral and Brain Sciences (PIBBS) |
| 2015 – | Consulting Editor, Attention, Perception and Psychophysics |
| 2008-2015 | Editor, Attention, Perception and Psychophysics (previously Perception and Psychophysics) |
| 2015-present | Consulting Editor, Psychological Review |
| 2013-present | Editorial Board, Behavioral Science & Policy |
| 2012-2013 | Guest Editor: Journal of Vision |
| 2009-2011 | Editorial Board: Psychological Science |
| 2007-2011 | Editorial Board, Journal of Experimental Psychology: General |
| 2005-2012 | Consulting Editor, Visual Cognition |
| 1998-2003 | Associate Editor, Perception and Psychophysics |
| 1996-2000 | Associate Editor, APA Encyclopedia of Psychology |
| 1998-2002 | Editorial Advisory Board, Academic Press, Encyclopedia of the Human Brain |
| 2003-2008 | Consulting Editor, Perception and Psychophysics (,) |
| 1996-2006 | Editorial Board, Cognitive Science |
| 1993-1997 | Consulting Editor, Perception and Psychophysics |
| 1989-1993 | Editorial Board, Journal of Experimental Psychology: Human Perception and Performance |
| 1991 | Consulting Editor, Spatial Vision and Guest Editor for Special Issue in Honor of Bela Julesz |
| 1996-2001 | Advisor, MIT Press |
| 1994-2001 | Book Review Editor, Perception |

**Professional Service Assignments:**

*External Committees, Review Panels*

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|---|---|
| 2017–2019 | National Academy of Sciences – Member of Decadal Survey of Social and Behavioral Sciences for Applications to National Security |
| 2014 | External Review Panel for the 2015 Grawemeyer Award in Psychology |
| 2012 to 2018 | National Academy of Sciences – Member of the Board on Behavioral, Cognitive, and Sensory Sciences (BBCSS) |
| 2010 to 2014(?)* | Menu Research and Development Advisory Council, Culinary Institute of America, Hyde Park, NY |
| 2009 - 2013 | National Academy of Sciences – Chairman of the Panel on Soldier Systems (Army Research Lab Technical Assessment Board) |
| 2006-2009 | Member of the Panel on Soldier Systems (Army Research Lab Technical Assessment Board - National Academy of Sciences) |
| 2007-2008 | Member of the Neuroscience Group of the Panel on Soldier Systems (Army Research Lab Technical Assessment Board - National Academy of Sciences) |
| 1998-2002 | NIH - Member of Visual Sciences B (VISB) review panel |
| | ad hoc grant reviews for: NIH, NIMH, NSF, AFOSR, HFSP, NSERC (Canada), SERC (United Kingdom), ISF (Israel), BSF (Israel), and NIMH-SEP |

*Internal University Service:*

| | |
|---|---|
| 2010 to present | Subcommittee on Promotions and Reappointments of the Executive Committee of the Department of Ophthalmology, Harvard Medical School |
| 2008 to 2017 (?) | Steering Committee: Center for Advanced Medical Imaging (CAMI) – Brigham and Women's Hospital/Radiology |
| 1998-1999 | Low Vision Search Committee, Schepens Eye Research Institute |
| 1990-1991 | President, MIT Phi Beta Kappa chapter |
| 1989-1991 | Advisor to Student Peer-Counseling Hotline, MIT |
| 1988-1989 | Faculty Fellow, MacGregor dormitory, MIT |
| 1987-1991 | Founder and Chair: MIT Program in Psychology |
| 1986-1987 | Committee on HASS-distribution courses outside the School of Humanities, Arts, and Social Sciences, MIT |
| 1985-1988 | Committee on Curricula, MIT |
| 1984-1991 | Steering Committee of the Cognitive Science major, MIT |
| 1981-1991 | Freshman Advisor including Advisor Seminars 1988-1990, MIT |

**Current Membership in Professional Societies**

American Academy of Arts and Sciences (Elected)

Psychonomic Society (Fellow)
American Psychological Association (Fellow - Divisions 1, 3, 6, 21)
American Psychological Society (Fellow)
Eastern Psychological Association (Fellow)
Society for Experimental Psychology (elected member)
American Association for the Advancement of Science (Fellow)
Radiological Society of North America (RSNA)
Vision Sciences Society

**Other National Boards**

| | |
|---|---|
| 2012-present | At-Large Member of the North American Board of the Union for Reform Judaism |
| 2015-present | East District Chair & Member of the Oversight Committee of the North American Board of the Union for Reform Judaism |

**Research Funding:**

*According to NIH Reporter, my total NIH funding since 1998 is $8,601,417. Obviously, that does not include funding before 1998 or the non-NIH grants.*

**RO1 EY017001** (Wolfe, PI) 4/1/07-10/30/19
NIH-NEI $397,826 (current year)
*Prevalence effects in visual search: Theoretical and practical implications*
The proposed research has three specific aims: 1) human foraging research, 2) studies of hybrid memory and visual search tasks in basic search and radiological settings and 3) to test theoretically and clinically motivated strategies to reduce miss errors related to the low prevalence of targets in applied search settings (e.g. cancer screening).

To identify the fundamental limitations of the human visual attention system that can produce errors in complex threat detection tasks. Specifically, to provide a novel description of capacity limitations that govern human monitoring of sustained dynamic scenes,

**RO1 CA207490** (Wolfe, PI) 09/06/16 - 08/31/21
*NIH-NCI* *$154,528 (TDC current year)*
*Improving Perception in Digital Breast Tomography*

Digital Breast Tomosynthesis (DBT) is a new 3-dimensional breast cancer imaging modality that has better sensitivity and specificity than 2-dimensional digital mammography. Reading the tomosynthesis images requires that radiologists develop new search strategies that may differ from their optimized 2-D strategy for Full Field Digital Mammography (FFDM), so that they can read efficiently and accurately. The medical image perception experiments in this proposal will address the lack of knowledge about optimal search strategies and will lead

to recommendations for low-cost interventions that can improve the use of DBT and, thus, the effectiveness of breast cancer screening.

**NSF 1848783** 8/1/19 - 7/30/22
*Nation Science Foundation* *$ 83,799 (TDC Current Year)*
*Multiple Object Awareness*

MOA is a simple modification of the basic Multiple Identity Tracking (MIT) task. Os observe a set of moving cartoon animals. They are asked to keep track of all of them as best they can. Every so often, we cover all items with disks and ask about the location of a specific animal. The crucial innovation is that we ask Os to keep clicking on disks until they find the target animal. If you are guessing, you need to click on half the items on average. If you have some idea about the target location, you need fewer clicks. Based on the number of clicks required, it is possible to derive a MOA capacity estimate of 8-12 items, far greater than MOT or MIT.

Our specific plans are: (1) To screen a large population in order to test the hypothesis that MOA will show a wider natural range of variation than MOT or working memory (WM), (2) to test the hypothesis that MOA is trainable in ways that MOT and WM are not, and (3) to determine if MOA training in the lab transfers to a real-world setting.

***NIH-NCI via*** *Westat, Inc (Wolfe, PI)* *4 annual awards 03/31/2016 - 06/15/2020*
*RSNA Medical Image Perception Lab* *$45,863.57 (TDC Current Year*

Radiologists routinely perform difficult and highly complex perceptual tasks. Perceptual research on understanding how radiologists accomplish these tasks can help improve radiological practice and reduce errors. However, radiologists are generally difficult to recruit for perceptual studies, as they tend to be very busy and their time is at a premium. The annual RSNA meeting brings together over 20,000 professional radiologists & trainees. If a fraction of the radiologists in attendance contributed 30 minutes of their time, that would be hundreds of hours of data collection; potentially a major contribution to medical image perception research. There are many perceptual laboratories that are interested in this field, but few have access to enough expert radiologists to conduct adequately powered studies. The purpose of this activity is to coordinate the Perception Lab at the RSNA annual meeting and to publicize its results.

**GE 2019A010980** *8/15/19-8/15/20*
*General Electric Corporation* *$61,435.00 (TDC Current Year)*
*The Use of Coronal Views in Breast Cancer Screening with ABUS (Automated Breast Ultrasound)*

ABUS (Automated Breast Ultrasound) is a breast imaging methodology that is particularly useful for women with dense breasts. In this study, we will eye track radiologists as they read ABUS cases. There are four specific questions.

1) Where do observers spend their time (e.g. coronal vs axial views)?
2) What strategies do readers use when reading the stack of coronal views?

3) Are there differences in time and/or accuracy related to viewing strategy?
4) How does oculomotor behavior relate to self-reports of strategy?
NOTE: Since this is a 'natural history' study, new questions may arise as we see the data.

*Past Funding:*

2/82 - 2/83 NIH 1 RO3 EY04297-01 False Fusion and Binocular Vision, **Wolfe PI**

12/83 - 11/86 NIH (1 R01 EY5087) Binocular Perception Despite Stereodeficiency, **Wolfe PI**

3/85 - 2/88 Lighting Research Institute (85:SP:5)
Focusing the Eyes: Sensory and Adaptive Properties of Accommodation
**Wolfe, PI**

7/85 - 6/87 Whitaker Health Sciences Fund
Basic Problems and Health-Related Issues in Human Vision
**Wolfe, PI**

4/84 - 3/88 BRSG spell out via MIT, Normal and Abnormal Binocular Human Vision
**Wolfe, PI**

2/88 - 1/89 Educational Foundation of America
Psychophysical evaluation of a model of motion perception
**Wolfe Co-Investigator** with E. Adelson

4/93 - 3/95 NIH (F32 EY06492) **Wolfe = Sponsor**
Individual differences in visual attention.
(Post-doctoral fellowship for Patricia O'Neill)

1/96 - 1/98 NIH (F32 MH11306) **Wolfe = Sponsor**
Circadian analysis of selective attention.
(Post-doctoral fellowship for Todd Horowitz)

7/96 - 12/99 HFSP spell out - Perception of surface properties of objects.
(Collaboration among 5 PIs: P Jolicoeur - director, S Kosslyn,
L. Chen, G. Humphreys, W. Cowan, **J.M. Wolfe**)

9/97 - 9/00 NSF SBR-9710498 Post-Attentive Vision; **Wolfe, PI**

7/94 – 7/99 NIH - NHLBI (RO1 - HL52992)
Bright light treatment of shift rotation insomnia
C. Czseisler, PI; **Wolfe, Investigator**

9/99 – 9/02 NIH – NORA ; Circadian adaptation to night work in older people.
C. Czseisler, PI; **Wolfe, Investigator**

12/86 - 7/05 NIH - NEI (R01 EY05087); **Wolfe, PI**
Psychophysical Structure of Human Vision

8/03-7/07 NIMH (RO1-MH065576) Horowitz-PI, **Wolfe-Investigator**; Control of Dynamic Attention

9/04-9/06 NIH (F32 EY016387) **Wolfe, Sponsor**
Serial and parallel processing in visual perception
(Post-doctoral fellowship for David Fencsik)

6/93 – 11/08 Air Force Office of Scientific Research (AFOSR) **Wolfe, PI**
Toward Guided Search 4.0

9/98 – 11/08 NIMH (RO1 - MH56020) **Wolfe, PI**
Post-Attentive Vision

10/06 -11/08 Dept of Homeland Security
Science and Technology (S&T) Directorate
Grant Number 06-G-017, **Wolfe, PI**
Visual Dimensions of the Explosive Detection Screener Task

10/09 - 9/10 Harvard Catalyst, Schaumberg, PI; **Wolfe, Investigator**
Developing a psychophysical test for dry eye.

9/09 - 9/12 NIH – NEI (3R01EY017001-03S1) **Wolfe, PI**
ARRA-NIH-NEI National Eye Institute
Supplement to: Prevalence effects in visual search: Theoretical and practical implications

7/03-6/11 NIH-NIMH (R01 MH065576) Horowitz-PI; **Wolfe, Investigator**
Control of Dynamic Attention

9/09-12/12 Toshiba Corporation, Seltzer-PI, **Wolfe- section PI**
Novel display strategies for lung nodule detection from CT scans. $100,000

12/12-11/15 NIH NRSA# 1F32EY022558-01A1 Post-doctoral fellowship: Melissa Vo; **Wolfe, Sponsor**, ended early, 6/14, when Melissa Vo took a faculty position.

01/12-12/14 Google Corporation, **Wolfe-PI**
Rules of visual foraging and visual search $71,000

11/13-11/14 Hewlett-Packard: HP Labs, **Wolfe-PI**
Next Generation Software and Visualization $100,000

11/1/09-10/31/15 Office of Naval Research $573,356

*Figure-Ground Processing, Saliency and Guided Attention for Analysis of Large Natural Scenes*

1/1/13-12/31/15 National Geospatial Agency. HM0177-13-1-0001_P00001 Wolfe –PI
Enhancing Visual Search by GEOINT Analysts $ 398,576

3/1/13-2/28/16 NSF SMA-0835976 (PI – Shinn-Cunningham, Boston University, Sub-contract-Wolfe, CELEST: A Center for Learning $ 419,37

2/23/16 – 2/22/18 U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC) (Wolfe, PI) Visual Search with Augmented Reality Information W911QY-16-2-0003 $1,244,671.53 (total costs, all years)

07/01/2015 – 06/30/2019 Army Research Office (Wolfe – Co-I, Trafton Drew, Utah, PI) R00000000000588 Attentional support for visual search and surveillance
TDC: $272,514

**Major Current Research Interests**

Work in the laboratory can be broadly divided into Basic and Clinical/Applied topics unified by a general interest in fundamental processes vision and visual attention. We use a variety of methodologies but we are primarily a human behavioral lab using psychophysical methods.

*Basic Research*

1. Preattentive vision - Studies of the processing of visual stimuli before they are selected by attention for further, more complete analysis. This includes studies of the fate of stimuli that are never selected for attentional scrutiny.

2. Attentional deployment - Studies of the mechanisms by which attention selects specific items. We have a long-standing interest in the guidance of attentional deployment by preattentive information and an interest in the temporal dynamics of search including studies of how to terminate searches when no target can be found. The theoretical core of work in this lab area is our Guided Search model.

3. Post-Attentive vision - Studies of the consequences of attention. Once attention has been deployed to an item and has been removed, what are the persistent effects of that act of attention? These topics, in turn, connect to questions concerning memory for visual stimuli.

4. Searching scenes – How do humans search complex real world scenes for real objects? How does knowledge of the structure and meaning of scenes guide attention?

5. Extended search – Most laboratory search tasks are structured in a series of "trials" lasting a second or so where observers look for one target. Real world search tasks (e.g. shopping) may involve search for multiple instances ("foraging") of multiple target types

("hybrid search"). Moreover, continuing with the same example, the observer may move, changing the search scene. How do the rules from single trial search apply in these more extended search and foraging tasks? What new rules do we need to account for extended search behavior?

6. Non-selective vision – Some aspects of visual processing do not appear to require selection of individual objects by attention. Sometimes this is called "gist", "gestalt", or "holistic" processing. Whatever its name, we believe that this is the product of a "non-selective" processing pathway in the visual system, operating in parallel with the selective, attentionally-bottlenecked pathway that permits object recognition.

*Clinical and Applied Research*

Our civilization has created a host of socially important visual tasks that can be seen as difficult visual searches through complex artificial scenes. Our basic science can be applied to these tasks and, in turn, the specific demands of these tasks stimulate new basic scientific questions.

7. Medical screening – Medical image perception poses a wide variety of visual search problems. For example, screening tasks like mammography or cervical cancer screening are visual search tasks for very low prevalence targets. Having studied the effects of low prevalence in the lab, we now study them in medical settings. We have a particular interest in the effects of prevalence on errors and on the interaction of prevalence effects with Computer Aided Detection (CAD) systems.

8. Airport security – Like medical screening, airport baggage screening is low prevalence search task involving complex stimuli and a strong aversion to miss errors. We are interested in behavioral interventions and modifications of the visual stimuli that could improve performance.

9. Foraging/Extended Search – As noted above, there are numerous other tasks that involve searching massive scenes or images for what may be hard to find targets. Some of these search tasks can be characterized as foraging tasks (c.f. picking berries from a bush, satellite surveillance, or reading a whole body CT of an accident victim). Here we want to know when it is time to move to the next bush, piece of territory, or the next case given that there might always be one more target in the current stimulus.

**Teaching:**
Teaching Award:

1989 Baker Memorial Prize for Undergraduate Teaching, MIT

Undergraduate Teaching:

1981-2009 I taught Introduction to Psychology for many years at MIT and Harvard. This took many forms from the large undergraduate course (MIT 9.00) to a 30-40 person version in the MIT Concourse Program (a Freshman intensive program). Harvard versions had 100-250 students. The audio recordings of lectures from the big MIT 9.00 class were posted on MIT's OpenCourseware site in 2007 and were in the top 10 on iTunesUniversity (iTunesU) for most of 2007-2008

2001-2010 Psychology and Literature, offered every Spring, 10-36 students/class, co-taught with an instructor from the MIT Writing program. The course had different theme each year and was designed to satisfy MIT Humanities and Writing requirements for MIT undergraduates.

2007, 2008 Perception, Harvard University

2007 Psychology and Free Will, MIT Concourse Program (freshman intensive program)

1994 Human Vision, Brown University with Leslie Welch

1994 Visual Attention, Brown University

1992 Sensation and Perception, Wellesley College

1983-1991 Sensation and Perception (9.35) MIT

1980-1982 Sensation and Perception (9.35), MIT and Wellesley, with R. Held

Graduate Teaching:

1981-1991 Human Vision, MIT (not every year)

1981-1991 Visual Physiology and Psychophysics w/ P Schiller (not every year)

2019 One week intensive visual attention course at Goethe U, Frankfurt, Germany

A wide variety of lectures have been provided as part of team-taught graduate survey courses, as well as guest lectures in a variety of other courses, lectures to Ophthalmology residents, etc.

**Graduate Students and Postdoctoral Training:**

<u>Doctoral or Thesis Committee Membership</u>

Carmen Egido (MIT)
Shinsuke Shimojo (MIT)
Joseph Scheuhammer (MIT)

Kyle Cave (MIT)
Miri Dick (Weizmann Inst, Israel)
Josee Rivest (Harvard)
Belinda Goodenough (U. New South Wales, Australia)
Greg Zelinsky (Brown)
Marvin Chun (MIT)
Nicholas John Reynolds (Australian National U.)
Vera Maljkovic (Harvard)
Satoru Suzuki (Harvard)
Diane Williams (Toronto)
Robert Cunningham (Boston U.)
Gregory Gancarz (Boston U.)
Michael Anes (Boston U.)
Arni Kristjansson (Harvard)
Steve Fraconeri (Harvard)
Richard DeVaul (MIT)
Todd Herrington (Harvard)
Ramakrishna Chakravarthi (Harvard)
Serena Butcher (Harvard)
Justin Wood (Harvard)
Michelle Greene (MIT)
Barbara Hidalgo-Sotelo (MIT)
Grayden Solman (U. Waterloo, Ontario, Canada)
Thomas Z Luo (Harvard Medical School)
Jason Daniel Rajsic (U. Toronto)
David Levari (Harvard)

Graduate Student Supervision as Advisor: Note that the Ophthalmology and Radiology departments at Harvard Medical School do not have PhD programs, so opportunities to serve as the primary advisor for doctoral students are severely limited.

Gregory Gancarz (Boston University, 1993-1996)
Jeff Doon (Boston University, 2010-2013, Ennio Mingolla – Primary Advisor)
Jinxia Zhang (2012 – 2014), visiting from Nanjing University of Science and Technology – NUST; Primary Advisor: Jing-yu Yang)
Bochao Zou (2015 - 2017), visiting from Beijing Institute of Technology, Beijing, Advisor: Prof. Yue Liu, School of Optoelectronics,

Post-doctoral Students (name, followed by current position)
Patricia O'Neill (1992 - 1995) - Professor – Western Conn. U
Todd Horowitz (1995 - 1999) - NIH/NCI
Gary Randall (1998 - 2000) Software development - UK
Peter Brawn (1998 - 2000) Access Testing Centre, Sydney, Australia
Aude Oliva (2000 - 2002 ) Senior Research Scientist. – MIT
Nayantara Santhi (2000 - 2002) U. Surrey, Guilford, UK
Melina Kunar (2003 - 2006) Assoc. Prof. in Psychology, Warwick, UK

David Fencsik (2003 -2007) Assoc. Prof, Cal. State East Bay
Evan Palmer (2003 - 2007) Assoc. Prof, San Jose State
Anina Rich (2005 - 2007), Asst. Prof., MACCS, Maquarie U, Sydney, NSW, Australia
Piers Howe (2007 –2010) Asst. Prof, U. Melbourne, Melbourne, Australia
Ricardo Pedersini (2007 – 2010) Teaching HS social science in Italy (9/20)
Ester Reijnen (2008 – 2009) ZHAW Zürcher Hochschule für Angewandte Wissenschaften, Zurich, Switzerland
Yair Pinto (2008 – 2010) Asset. Prof, University of Amsterdam
Karla Evans (2007 – 2013) Asst. Prof. York, UK
Michelle Greene (2009 – 2011) Asst. Prof, Bates College, Maine
Melissa Vo (2009 – 2014), Professor, Goethe University, Frankfurt, Germany
Trafton Drew (2010 – 2014) Asst. Prof., U. Utah
Krista Ehinger (2013 – 2015) Senior Lecturer, U. Melbourne
Matt Cain (2013 – 2014) Research Psychologist, NSRDEC, U.S. Army Soldier RD&E Center, Natick, MA
Preeti Sareen (2013 – 2015)
Maria Nordfang (2013 – 2014) Neuropsychologist, head of the vision and attention team, Department of Neurology, Rigshospitalet, Denmark
Chia-Chen Wu (2015 –
Farahnaz Wick (2016 –
Iris Wiegand (2017 – 2018) Max Planck, Berlin
Matthew Lowe (2019-2020)

Research Fellows

Constance Royden (1997) now Associate Professor - Holy Cross, Worcester, MA

Research Associates

Todd Horowitz (1999-2012) Program Director, National Cancer Inst
Kathy O'Craven (1999-2000) was Asst. Prof. - U Toronto

Visiting Scientists (including Masters & PhD students)

Aline Bompas (2001) – DYCOG Team, Lyon Neuroscience Research Center
Ester Reijnen (Sept-Nov, 2006) Zurich University of Applied Sciences, Switzerland
Yair Pinto (Dec, 2006 - June, 2007, 2009-2010) U. Amsterdam
Michael Zehetleitner (Mar-May, 2009) U. Munich
Patricia Graf (Mar – Sep, 2009), U Munich
Maria Nordfang (Feb – Aug, 2010, March-May, 2012), U. Copenhagen
Kazuya Ishibashi (Mar – Sep, 2010), Kobe U, Japan
Francesca Bocca (July-Sep, 2010), U Munich
Yasuki Noguchi (July – Sept, 2011), Kobe U, Japan
Lisa Pfanmuller (April – Oct, 2012), U Munich
Dejan Draskow (May – Oct, 2012, Sept-Oct, 2013), U Munich
Kilian Semelman (Aug – Sept, 2012, April-June, 2013), U Munich
Johan Hulleman (Oct – Dec, 2012), U. Manchester, UK
Warren Reed (Sept – Nov, 2013), U New South Wales, Sydney, NSW, Australia

Beatriz Gil Gómez de Liaño (June-July, 2014), Universidad Autónoma de Madrid (Summer, 2015)
Duygu Sönmez (Feb-July, 2014) Hacettepe University, Ankara, Turkey
Matt Thompson (July-Dec, 2014), U. Queensland, Brisbane, Australia
Carlos Velasco Pinzon (Aug-Sept, 2014), Oxford U
Ruggero Micheletto (Aug 2015- July 2016), Yokohama City University
Zhe Huang (Feb 2016 – August 2016) U Munich
Ellen Kok (April 2016 – June 2016) Maastricht University
Longsheng Wei (Oct 2016 – Oct 2017) China University of Geosciences Wuhan City, Hubei Province, China
Caroline Seidel (July2017 – October 2017), Goethe U, Frankfurt
Erica Westenberg (July2017 – October 2017), U Munich
Yung-Hao Yang (April 2017 – 2018) National Taiwan University, Taipei
Nurit Gronau (Sept 2017 – Aug 2018) Open University, Israel
Inga Korolczuk (Jan 2019 – March 2019) Bangor, Wales, UK
Charles Ludovici (March 2019 – June 2019) U. Sydney, Australia
Aoqi Li (March 2019 – June 2019), Wuhan U, Wuhan, China
Raquel Colorado Cajas (Feb 2019 – June 2019) – UAM, Madrid, Spain (Undergrad)
Leah Kumle (July 2019 – Sept 2019) – Goethe U, Frankfurt, Germany
Daniela Gresch (July 2019 – Oct 2019) Ludwig Maximilian U, Munich, , Germany
Laura Cruces (Feb 2020 - ) UAM, Madrid, Spain
Yke Bauke Eisma (March 2020) TUDelft, Delft, Netherlands*
Jonathon Li (Feb – March 2020) U. Melbourne, Australia *

* Left early, due to corona virus

**Outreach:**

The lab routinely hosts summer students, typically from two programs:

Project Success: This is a program at Harvard Medical School to "open the door to biomedical careers" for under-represented minority High School students. My laboratory has hosted and mentored one or two students from this program every summer since 1998.

Research Science Institute of the Center for Excellence in Education: This is an international program giving research experience to talented high school students. My laboratory has hosted and mentored one or two students from this program every summer since 1996. (Three students in 2016, four in 2017).

Previously we hosted students from CELEST: an NSF-funded Science of Learning Center that was based at Boston University. CELEST ran a summer program for undergraduates with an emphasis on diversity. We hosted 1-2 students each year for several years.

**Research Presentations:**
A recent example (Talk at U. Trento, Italy, Feb 17, 2016) can be found at

https://www.youtube.com/watch?list=PLsBUh_gUwMHZaEcOj0dJ2-c4PbcZyhglR&v=rk9iMdfbukE

Selected Invited Colloquia:

Brandeis
Princeton U.
Yale U.
Brown U.
NE College of Optometry
Tufts U, Somerville, MA
U. Waterloo, Ontario, Canada
Johns Hopkins U.
Ohio State
U. of Utah
Georgetown (Washington, DC)
U .Southern California
Columbia U (12/99)
Boston VA Hospital (12/00)
MIT AI lab (1/01)
Rice U (2/01)
U. Beijing Graduate School (8/01)
Schepens Eye Research Inst (9/01)
U. Houston
Wesleyan College, CN
Harvard U.
U. Delaware
NIH, Bethesda, MD
Boston U.
McMaster U, Ontario, Canada
U. of Toronto
MIT
Shriver Center (Waltham, MA)
CalTech
Duke (11/99)
Rutgers U. (2/00)
University College London (12/00)
Houston - Optometry (2/01)
Brandeis (4/01)
Boston U (9/01)
Vanderbilt U/ (Nashville, TN, 4/02)
Boston U Med School (Raviola Lecture, 4/02)
Wright-Patterson AFB (7/02)
Georgia Tech (10/02)
Concordia U, Montreal (2/03)
MGH-Navy Yard (3/03)
Rockefeller U, NY (1/03)
Harvard Psych (3/03)
MIT-BCS (4/03)
Boston U Beck Memorial Symposium (9/03)
Macquarie U, Sydney, Australia (1/04)
Dartmouth (3/04)
TSA/Atlantic City (10/04)
Columbia (3/05)
Analogic Corporation (6/05)
U Houston (11/05)
BWH (radiology) (1/06)
MIT (3/06)
Princeton (3/06)
MGH(Cytopathology) (5/06)
Mitsubish, Cambridge, MA (1/07)
Colorado, Boulder (2/07)
UC Davis (4/07)
Novartis, Cambridge, MA (9/07)
U Toronto (1/08)
Columbia U. (2/08)
Vanderbilt U, Nashville, TN (6/08)
BWH (Women's Imaging ) (9/08)
Stanford (8/04)
Duke (3/05)
U. Illinois (3/05)
Northeastern U (9/05)
York U (Toronto) (1/06)
Harvard (2/06)
W. Conn. State (3/06)
Siemens (NJ) (3/06)
CalTech (1/07)
Harvard U (IIC) (2/07)
Berkeley, CA (4/07)
Oxford, UK (9/07)
UT Austin (10/07)
Analogic Corp, Peabody, MA (1/08)
U. Minn (4/08)
BWH (Radiology) (8/08)
Schepens Eye Res (MA) (9/08)

Mass Eye&Ear (MA) (1/09) Columbia (1/09)
NAS False Alarm EDS meeting, San Francisco (2/09)
National Geospatial Agency visual search meeting, Airlie, VA (2/09)
Queen's U (Kingston, Ont) (2/09) NYU (4/09)
U. Copenhagen (7/09) Dalhousie U, Halifax, NS (9/09)
NE Col. Optom. Boston (10/09) Boston U. (10/09)
Johns Hopkins (2/10) Yale (3/10)
Johns Hopkins (9/10) MGH Martinos (9/10)
MIT (CSAIL) (9/10) Washington U, St Louis (11/10)
Northwestern, Evanston, IL (11/10) Harvard MBB (3/11)
Harvard Med, Nuc. Medicine (4/11) Indiana U (10/11)
Università degli Studi di Milano-Bicocca, Milan, Italy (10/11)
Harvard Decision Group (2/12) Northeastern U (3/12)
Kansas State U (3/12) U. Maryland (3/12)
Procter & Gamble, Cincinnati (5/12) Harvard Psych (6/12)
Pathology Dept, MGH (6/12) Brandeis (9/12)
Conn. College (9/12) U. of Arizona (1/13)
Hewlett-Packard, Palo Alto, CA (1/13) Mich. State U (1/13)
U. Reykjavik, Iceland (4/13) U. Copenhagen (4/13)
U. Vienna (7/13) U. Queensland, Australia (8/13)
U. Sydney, NSW (8/13) Macquarie U, Sydney, NSW (8/13)
U. New South Wales (8/13) Aptima Inc, Woburn, MA (9/13)
Brown U. (10/13) UCSD (12/13)
Inst for Infocomm Research (I2R), Singapore (1/14)
NUS-Duke Singapore (1/14) Concordia, Montreal (2/14)
Kaiserslautern, Germany (3/14) Ottawa U, Ottawa (4/14)
Free University, Amsterdam (5/14) Amazon, Seattle, WA (6/14)
National Central University, Jhongli City, Taiwan (6/14)
U. Louisville, KY (9/14) U. Madrid (UAM) 10/14
Higher School of Economics, Moscow, 2 talks (10/14)
Goethe U (Frankfurt) (2/15) U. Geneva (2/15)
MGH, Boston (2/15) U. York, UK (7/15)
Macquarie U, Sydney, NSW (9/15) UNSW, Sydney, NSW (9/15)
U. Sydney, Sydneym NSW (9/15) Tufts (Radiology) (9/15)
Peking University (10/15) NYU/Shanghai (9/15)
East China Normal U (10/15) U. Central FL (11/15)
Pinterest, San Francisco (1/16) U. Penn, Philadelphia (2/16)
CBMM, MIT, Cambridge, MA (3/16) ZHAW, Zurich (3/16)
AGElab, MIT, Cambridge, MA (4/16) U. Victoria, BC (5/16)
Simon Fraser U, BC (5/16) Wash. U, St Louis (6/16)
U. Liverpool, UK (7/16) U.Missouri, Columbia, MO (9/16)
U. Utah (1/17) U. Trento, Italy (2/17)
NYU-Abu Dhabi (2/17) Philips Healthcare, Cambridge, MA (3/17)
U. Haifa (3/17) U. Tel Aviv (3/17)
Bar-Ilan U (3/17) Oxford U (4/17)
Southampton U (4/17) Childrens Hospital, Boston (Kreiman) 5/17

Rice U, Houston (7/17) IBM Watson Health (9/17)
Vanderbilt U (10/17) Harvard, CBB (2/18)
ZHAW, Zurich (3/18) Mass Eye and Ear, Boston (5/18)
Woods Hole, BMM course (8/18) UWisc (10/18)
St. Vincents Hosp, Worcester, MA (10/18)
UC Berkeley (10/18) St. Vincents Hosp, Worcester, MA (12/18)
Max Planck Inst, Frankfurt (2/19) U Minn (3/19)
Carnegie Mellon U (4/19) Mt. Auburn Hospital, Cambridge, MA (6/19)
Woods Hole, BMM course (8/19) Simon Fraser U, Vancouver – 2 talks (10/19)
U. Haifa, Israel (11/19) Open U of Israel, Ra'anana (11/19)
U. Tel Aviv (11/19) UC Davis (Geng/Zoom/Covid, 7/20)
Ohio State (Leber/Zoom/Covid, 7/20) U Chicago (Awh/Vogel/Zoom, 9/20)
U Toronto (Pratt/Zoom/Covid 10/20) Macquarie U, Sydney (Rich/Zoom/Covid 11/20)
IEEE (Auditory, Slaney) 11/20 Goethe U, Frankfurt, Germany (Vo/Zoom/Covid, 11/20)
Tuebingen, German (Zhaoping Li, Zoom/Covid, 2/21)
Stirling U, Scotland (Millen, Zoom/Covid, 2/21)

Invited Conference Presentations (136 as of Dec 2020)

1993 Guided Search 2.0: The upgrade. Human Factors Society

1993 The effects of aging on normal visual function. ARVO Symposium on Cataract at the Academy of Ophthalmology Meeting,

1993 A new look at binocular single vision. Academy of Optometry

1994 Extending Guided Search: Why Guided Search needs a preattentive "item map". CW Eriksen Festschrift, U. Illinois, May 20-22

1995 Understanding visual search and visual attention. Invited Address, Eastern Psychological Association Annual Meeting, Boston, April 1

1995 Where is Guided Search going? Banff Annual Seminar in Cognitive Science (BASICS) Banff, Alberta, CA, May 1995

1996 Vision: preattentive, attentive and post-attentive. New Fellows Address American Psychological Association meeting - Toronto, Aug. 1996

1996 Post-attentive vision.
International Congress of Psychology - Montreal, Aug. 1996

1997 Visual search: Preattentive processing and the guidance of visual attention. and Visual experience: Less than you think, more than you know. at Neuronal basis and psychological aspects of consciousness. -

Instituti Italiano per gli Studi Filosofici, International School of Biocybernetics, Ischia, Italy, Oct, 1997

1998 HM as a model of vision: Vision as amnesia. - American Psychological Association, Mind, Brain, and Behavior Symp. Aug 14th San Francisco.

1998 How quickly they forget: A modest alternative to blinks and blindness. Abstracts of the Psychonomic Society (Dallas, Nov, '98) Abs. #507

1999 Paying attention to attention in the teaching of Psychology. - National Institute on the Teaching of Psychology (NITOP), St. Petersburg, Jan. 1999

1999 Vision, attention, and memory. 3rd annual Vision Research conference. Preattentive and Attentive Mechanisms in Vision (7-8 May): Ft. Lauderdale, FL.

1999 The Deployment of Covert Attention: Two Surprises. NATO RTO/SCI-12 Workshop on Search and Target Acquisition. (21-23 June): Utrecht, The Netherlands

2000 Post-attentive vision and the illusion of perception. Invited paper presented at the Toward a Science of Consciousness, Tuscon, AZ. (April 11, 2000)

2000 The unbinding problem. Invited paper presented at the annual meeting of the Psychonomic Society, New Orleans, LA. (Nov 18, 2000)

2001 Change Blindness Workshop, Duke U, May 26, 2001

2001 From stimulus to perception: "Small is the gate and narrow the road", Invited Plenary speaker at the Fifth annual meeting of the Association for the Study of Consciousness. Duke U, May 28, 2001

2001 Levels of Perceptual Delusion: The problem of post-attentive vision, invited speaker at 'Levels of Perception' conference in honor of Ian Howard, York U., Toronto, Ontario June 19-23, 2001

2002 What are we searching for? Studies in Visual Attention. Presidential Address at Annual meeting of the Eastern Psychological Association, Boston, April 9, 2002

2002 What guides the development of attention in visual search? Old question – new answers. Invited Symposium Talk Meeting of the Psychonomic Society, Kansas City, MO(Nov, 2002).

2003 Modeling visual search: Guided search and its friends. Invited Keynote, Munich Symposium on Visual Search, Holzhausen am Ammersee, Bavaria, Germany (June, 2003).

2003 Speed limits on the top-down guidance of attention. Invited talk, International workshop on Visual Attention. San Miniato, Italy (June, 2003).

2004 Reconfiguring your visual system: How and how fast do you change your mind? Invited talk: Visual Cortex: A variety of viewpoints. Satellite meeting of the Australian Neuroscience Society, (Melbourne, Jan 27, 2004)

2004 A two-pathway architecture for visual attention (w/ Todd Horowitz): Invited Talk: Australian Neuroscience Society, (Melbourne, Jan 29, 2004)

2004 The role of selective attention in human vision: A two pathways account. Invited Talk: Eighth International Conference on Cognitive and Neural Systems, Boston University on May 19-22, 2004.

2004 What Are We Searching For? Seeking Guidance in the Study of Visual Attention. Invited Plenary Talk: Annual meeting of the American Psychological Association, Honolulu, July 28 – Aug 1, 2004

2005 Guided Search: Invited talk at Modeling Integrated Cognitive Systems (MICS) Saratoga Springs, NY, March 3-5, 2005

2005 How Might the Rules that Govern Visual Search Constrain the Design of Visual Displays? Invited talk - Society for Information Display May 22-27, 2005 Boston, Massachusetts USA

2006 Searching the Cytological Sample. Invited - Annual meeting of the UK National Association of Cytologists, York, UK April 22, 2006

2006 Attentional time-sharing in multiple object tracking Todd S. Horowitz, Jeremy M. Wolfe, George A. Alvarez, & David E. Fencsik Invited Symposium talk – Vision Sciences Society, Sarasota, FL, May 5, 2006

2006 Changing your mind: Psychophysical measurement of the top-down and bottom-up contributions to the guidance of visual attention. Invited Symposium talk – Vision Sciences Society, Sarasota, FL, May 5, 2006

2006 Prevalence effects in visual search: If you don't find it often, you often don't find it. Invited talk – MACCS Visual Cognition Meeting, Macquarie U, Sydney, NSW, Australia, June 1-2, 2006

2006 Selective and non-selective pathways in visual search and scene perception. Invited talk – Bio-Inspired Scene Understanding Using a Network of

Disparate Sensors, Office of Naval Research, Arlington, VA, , July 25-26, 2006

2007 Guidance of visual search by unlocalized scene properties Invited talk MIT Scene Understanding Seminar (SUNS07), MIT, Cambridge, MA, Feb, 1-2, 2007

2007 How do we see what we "see". Ultrasound/Women's Imaging Course, Westin Hotel, Boston, May 2, 2007

2007 Keynote Address: Capturing the user's attention: Insight from the study of human vision. UIST (ACM Symposium on User Interface Software and Technology) , Newport, RI, Oct. 9, 2007.

2008 Highly Efficient Search for Arbitrary Objects in Natural Scenes Invited talk MIT Scene Understanding Seminar (SUNS07), MIT, Cambridge, MA, Feb, 1, 2008

2008 The Puzzling Relationship of Attention and Awareness: The View from Étienne Bonnot de Condillac's Château, Invited talk at Vision, Attention and Emotion Symposium at the Italian Academy of Columbia U, NYC, March 25, 2008

2008 Hiding in plain sight: Visible information that you can't find. Visualization in the World symposium, Charlotte Visualization Center, U. North Carolina, Chapel Hill, April 24-25, 2008.

2008 Keynote Address: Modeling visual search in real scenes: What will it take? Firbourg/Munich Visual search symposium, Murten, Switrzerland, July 16-19, 2008

2008 Classical and non-classical guidance of attention in visual search. International Congress of Psychology, Berlin, July 22-25, 2008

2008 The role of memory in visual search. APA annual meeting, Boston, Aug. 14-17, 2008

2008 Perceptual Learning, Motor Learning and Automaticity, Amsterdam, Dec. 8-12, 2009

2009 Search in real scenes: The latest mysteries, the latest clues. Invited talk MIT Scene Understanding Seminar (SUNS09), MIT, Cambridge, MA, Jan 30, 2009

2009 The human in the loop. Invited talk Algorithm Detection for Security Applications. Northeastern U., Boston, MA April 23, 2009

2009 Perception: How we "see" things. Invited talk American Roentgen Ray Society 2009 Annual Meeting, Boston, MA, April 29, 2009

2009 Human in the loop: Invited talk: American Society of Neuroradiology meeting, Vancouver May 16-21, 2009

2009 If you don't find it often, you often don't find it: The role of target prevalence in visual search tasks. Invited talk: Harvard Medical School Department of Ophthalmology, 2009 Update on Ophthalmology, June 20, 2009

2009 Mammography in the blink of an eye. Last-minute invited talk (I replaced a "new investigator" speaker who couldn't attend the APA Annual Meeting, Toronto, ON, 8/8/09

2009 Keynote Address: When should I leave? Invited talk NGA Academic Research Program (NARP) Symposium, Washington, DC 9/29-30/09

2009 If I can see so much, why do I miss so much. Distinguished contribution award address. New England Psychological Association Annual meeting, Worcester, MA, 10/10/09

2009 Keynote Address: What are we searching for? Adventures in the airport, the hospital, and the lab. Invited talk: IEEE Applied Imagery Pattern Recognition Conference, Washington, DC 10/15-16/09

2009 Pay Attention! Harvard Graduate School of Education faculty-industry leader research project entitled "Learning Innovations Laboratory" Oct 27-28, 2009, Cambridge, MA

2010 How might visual search and visual attention influence sports performance? Sports Vision 2010, Jan 24, 2010, Fenway Park, Boston, MA

2010 A series of three lectures given to the Graduate School consortium of Swiss Psychology departments (organized by Joe Krummenacher) April 9-10, 2010

2010 How can it be so easy to find arbitrary objects in natural scenes? Invited talk: Selection and control mechanisms in perception and action. Meeting at Hebrew University, Inst. for Advanced Studies, April 12-15, 2010, Jerusalem, Israel

2010 Who is looking at that image? The human factor, Invited talk: Algorithm Development for Security Applications (ADSA) Workshop 3: Application to Advanced Imaging Technology (Whole Body Imaging) April 27-28, 2010, Northeastern University

2010 If I am so good at this, why do I miss so much? Invited plenary talk, International Society for Magnetic Resonance in Medicine, May 4, 2010, Stockholm, Sweden

2010 Visual Search Gets Real: From the Lab to the Airport to the Radiology Suite. Invited Keynote Address, Assoc. for Psychological Science (APS), May 27, 2010, Boston, MA

2010 Visual Search: Telluride neuromorphic workshop, July 1-8, 2010, Telluride, CO

2010 On Vision & Attention, National Cancer Institute Basic and Biobehavioral Research Branch Expert Meeting: Sensory Sciences & Embodied Cognition August 4-5, 2010, Washington, DC; 3 presentations

2011 The future of psychology. in "Presidential Perspectives on Psychology" Symposium, Eastern Psychological Association Annual Meeting, March 11, 2011, Boston

2011 "What's my motivation in this scene? Visual search when it really counts" 59th Nebraska Symposium on Motivation, U. Nebraska, Lincoln, NE, April 7-9, 2011

2011 The Salami at the Airport: Visual Search Gets Real" Saturday, Vision Sciences Society Public Lecture, May 7, 2011 Naples, Florida

2011 Dancing Chickens and iPods Stored in Honey: Why Visual Attention Research Matters. Keynote lecture for WestConn Research Day, Western Connecticut State University, May 13, 2011, Danbury, CT

2011 Visual Search. Tutorial lectures at The 3rd Beijing International Symposium on Computational Neuroscience. Medical School, Tsinghua University, Beijing, China, July 13, 2011

2011 Don't pack your iPod in honey: Lessons from the study of visual search. Keynote address at Asian Conference on Visual Perception, Hong Kong, July 16, 2011

2011 If I can see so much, why do I miss so much? And why should I care? Invited talk at the Mind Matters conference. Procter and Gamble, Cincinnati, Ohio, October, 13, 2011

2011 Visual search for objects. Invited talk at the Rovereto Attention Workshop, Rovereto, Italy, October 28, 2011

2011 How might technology improve human detection performance? Algorithm Development for Security Applications (ADSA) Workshop 6: August 8, 2011, Northeastern University

2012 The rules of guidance in visual search. Keynote address at 1st Indo-Japan Conference on Perception and Machine Intelligence. Kolkata, India Jan 20-21, 2012

2012 Is that a salami in your suitcase? When visual search really matters. Keynote address at the 2012 Great Plains Students' Psychology Convention, NW Missouri State U, Maryville, Missouri

2012 There is a world elsewhere" Guided Search beyond the computer screen. Keynote address at Visual Search and Selective Attention (VSSA III), July 20-23, 2012 at Holzhausen/Ammersee, Germany.

2012 Afloat on a sea of images: How do humans deal with New tools and practices for seeing and learning in medicine? Keynote address at Visualization Tools in Medical Education and Expertise (ViTiMEE) Oct. 22-23, Turku Finland.

2013 If I can see so much, why do I miss so much? Entertainment Software and Cognitive Neurotherapeutics Society Society, ESCoNS 2. Los Angeles, 3/14-17/13

2013 Wolfe, J. M., Cunningham, C. A., & Drew, T. Hybrid visual and memory search. Paper presented at the APS annual meeting in a symposium on Predicting Choice from Exploration, Washington, DC. May 26, 2013

2013 Wolfe, J. M. How selective and non-selective pathways contribute to visual search in scenes. 17th International Conf. on Cognitive and Neural Systems (ICCNS), Boston University, June 4, 2013

2014 Keynote Address: Wolfe, J M Visual Search from Lab to Clinic and Back. SPIE 2014 Medical Imaging, Conference 9037 Image Perception, Observer Performance, and Technology Assessment, San Diego, Feb 15-20, 2014

2014 Keynote Address: Wolfe, J M The Human Search Engine 2014. 56th Conference of Experimental Psychologists (TeaP), Giessen, Germany,March 31-April 2, 2014

2014 Wolfe, J M If I can see so much, why do I miss so much. Invited speech. 17th Conference on Attention and Perception, Chaiyi, Taiwan. June, 25-26, 2014

2014 Wolfe, J M Beyond searching for red vertical lines: New frontiers in visual search. Invited speech. 17th Conference on Attention and Perception, Chaiyi,

Taiwan. June, 25-26, 2014

2014 Wolfe, J M Registered Reports and Replications. Reliability and Replication in Psychological Science, Princeton University, April 12, 2014

2014 Wolfe, J M Dancing chickens and gorillas in the lung: If I can see so much, why do I miss so much? Invited talk at The Grand Illusion of Consciousness-4 workshop, organized by the Cognitive Research lab of Higher School of Economics (Moscow) and the Cognitive research group of Saint Petersburg State University.

2015 Wolfe, J M Medical Image Perception I: The human search engine, Invited talk at Fourth Malmö Conference on Medical Imaging, Gothenburg, Sweden, May 28-30, 2015

2015 Wolfe, J M Medical Image Perception II: How much of my time is this image worth? Invited talk at Fourth Malmö Conference on Medical Imaging, Gothenburg, Sweden, May 28-30, 2015

2015 Wolfe, J M., Drew, T, Cunningham, C, Ehinger, K, & Boettcher, S. Hybrid Search: How Long-Term Memories Interact with Visual Search. Psychonomic Society Governing Board Edinburgh Symposium, Edinburgh, July 17, 2015

2015 Wolfe, J M, If I can see so much, why do I miss so much? What the study of attention tells us about medical image perception. I-MED Network Doctors' Conference, Sydney Aug, 28-30, 2015

2015 Wolfe, J M, I am so through with you: When is it time to stop looking at an image? I-MED Network Doctors' Conference, Sydney Aug, 28-30, 2015

2016 Wolfe, J M, If I can see so much, why do I miss so much? 38th National Institute on the Teaching of Psychology, St. Petersburg Beach, FL, Jan 2-6, 2016

2016 Wolfe J M, Hybrid foraging: Searching for many instances of several things Keynote lecture, European Mathematical Psychology Group, University of Copenhagen, June 22, 2016

2016 Wolfe J M, Hybrid Search: How long-term memories interact with visual search. Invited Talk, 4th International TVA Meeting, University of Copenhagen, June 24, 2016

2016 Wolfe, JM What can the study of visual search tell us about breast cancer screening? The Sir John Stebbings Lecture, Symposium Mammographicum, Liverpool, UK, July 4, 2016

2016 Wolfe, JM Dancing chickens and gorillas in the lung: If I can see so much, why do I miss so much? Annual meeting of the New England Teachers of Psychology (NETOP), Hopkinton, MA, Aug 10, 2016

2016 Wolfe, JM How the heck did I miss that? National Academy of Sciences' (NAS's) Summit on Social and Behavioral Sciences for National Security, Washington, DC, October 4-5, 2016

2016 Visual search in a changing world: There are so many things to find. Annual Meeting of Taiwanese Psychological Association, Tainan, Taiwan, Oct 14-16, 2016 (plus two other shorter talks)

2016 Keynote Address: How the heck did I miss that? The human search engine and medical image perception. Diagnostic Error in Medicine 9th International Conference, Los Angeles, CA, Nov 7, 2016

2016 How did I miss that? How did I find that? Medical Image Perception Radiological Society of North America. Chicago, Nov 26 – Dec 1, 2016. Four versions given in their "Discovery Theater".

2017 The Incidental Gorilla: How we find or don't find things that we want or don't want to find. Cognitive Keynote at Eastern Psychological Association meeting, Park Plaza, Boston, MA Mar. 18, 2017

2017 The Incidental Gorilla: What can the science of visual attention tell us about the art of radiology? Keynote at SCIA 2017, Scandanavian Conference on Image Analysis, Tromso, Norway, June 13, 2017

2017 Object Perception, visual Attention, and visual Memory: 25 years of work on visual search. Keynote at OPAM (Object Perception, Attention, and Memory) meeting, Vancouver, BC, Nov. 9, 2017

2017 How Did I Miss That? Perceptual and Attentional Roots of Medical Errors. Refresher Course #154 at Radiological Society of North America (RSNA) meeting, Chicago, IL Nov 26, 2017

2018 Why didn't I see that? The role of attention in visual search errors. Keynote - IGTA2018 (International Conference of Image and Graphics Technology and Application), Beihang University (BUAA, 37 Xueyuan Road, Beijing, 100083) April 9, 2018

2018 Anne Treisman's legacy and the future of visual search, Keynote – Visual Search and Selective Attention IV (VSSA4), Ammersee, Bavaria, Germany, July 14, 2018

2018 How the heck did I miss that: What Can Behavioral Science Tell Us About Clinical Pathology? Invited CME class with Jennifer S. Trueblood (Vanderbilt), American Society for Clinical Pathology (ASCP), Baltimore, MD, Oct. 3, 2018

2018 OMG, I did not see that! The science of missing what is right in front of your eyes. Radiology Grand Rounds at St. Vincent's Medical Center, Worcester, MA. Oct 10, 2018

2018 How Did I Miss That? Perceptual and Attentional Roots of Medical Errors. Refresher Course #RC354 at Radiological Society of North America (RSNA) meeting, Chicago, IL Nov 27, 2018

2019 Changing the Definition of Clinical Trials – challenges for basic and social scientists. U. Minn, Annual Research Ethics Day *Given at Major Changes in Research Rules & Oversight:Making Progress or Creating New Problems?* Minneapolis, MN, March 6, 2019

2019 Decadal Survey of Social and Behavioral Sciences for Applications to National Security. Panel at International Convention of Psychological Science (ICPS), Paris, March 9, 2019

2019 If you want people to find "it", what should "it" look like? Invited talk at Vis X Vision: Workshop on Novel Directions in Vision Science and Visualization Research @ IEEE VIS2019 meeting. Vancouver, BC, October 20, 2019

2019 Drillers and Scanners: What eye movements tell us about medical image perception and Guided Search, The Active Vision Workshop, The Jerusalem Brain Community, The Hebrew University of Jerusalem, Nov 4, 2019

2020 How do you find (or fail to find) what you are looking for? Visual search in medical images. CEPET medical expertise workshop Oct 19-20, Macquarie U, Sydney, Australia (By Zoom – COVID)

2020 Rare threats pose cognitive challenges. ADSA22: Reducing Operator Cognitive Load in Aviation Security Equipment (annual meeting of ALERT *(Awareness and Localization of Explosives-Related Threats)* - a multi-university Department of Homeland Security Center of Excellence. Zoom, Nov 24, 2020

2020 OMG I did not see that! How we can miss what is right in front of our eyes. The 2020 James Bull Lecture of British Society of Neuroradiologists, 800 people on Zoom, Dec 16, 2020.

**Bibliography:**
**Google Scholar profile (reasonably accurate):**
**http://scholar.google.com/citations?user=WQmNzVMAAAAJ&hl=en&oi=ao**
**33,077 citations, h= 83 in April 2020**
**ORCID**
**orcid.org/0000-0002-6475-1984**

**Complete List of Published Work in NCBI My Bibliography:**
**http://www.ncbi.nlm.nih.gov/myncbi/jeremy.wolfe.1/bibliography/40511239/public/?sort=date&direction=ascending**

**212 Original, peer-reviewed reports, 16 proceedings, 1 textbook (6 editions), 39 book chapters, 35 other, 447 published abstracts**

**Original Reports (in refereed publications):**

1. Kinchla, R.A., & Wolfe, J.M. The order of visual processing: "Top-down", "bottom-up", or "middle-out". Perception and Psychophysics 1979; 25: 225-231.

2.Wolfe, J.M., & Held, R. Eye torsion and visual tilt are mediated by different binocular processes. Vision Research 1979; 19: 917-920.

3. Wolfe, J.M., & Owens, D.A. Evidence for separable binocular processes differentially affected by artificial anisometropia. American Journal of Optometry and Physiological Optics 1979; 56: 279-284.

4. Wolfe, J.M. The computer paper illusion. Perception 1979; 8: 347-348.

5. Held, R., Gwiazda, J., Brill, S., Mohindra, I. & Wolfe, J.M. Infant visual acuity is underestimated because near threshold gratings are not preferentially fixated. Vision Research 1979; 19: 1377-1379.

6. Gwiazda, J., Wolfe, J.M., Brill, S., Mohindra, I., & Held, R. Quick assessment of preferential looking acuity in infants. American Journal of Optometry and Physiological Optics 1980; 57 :420-427.

7. Wolfe, J.M., & Held, R. Cyclopean stimulation can influence sensations of self-motion in normal and stereoblind subjects. Perception and Psychophysics 1980; 28: 139-142.

8. Wolfe, J.M., Held, R., & Bauer, J.A. A binocular contribution to the production of optokinetic nystagmus in normal and stereoblind subjects. Vision Research 1981; 21: 587-590.

9. Wolfe, J.M., & Owens, D.A. Is accommodation colorblind? Focusing isoluminant contours. Perception 1981; 10: 53-62.

10. Wolfe, J.M., & Held, R. A purely binocular mechanism in human vision. Vision Research 1981; 21: 1755-1759.

11. Wolfe, J.M., & Held, R. Binocular adaptation that cannot be measured monocularly. Perception 1982; 11: 287-295.

12. Wolfe, J.M., & Held, R. Gravity and the tilt aftereffect. Vision Research 1982; 22: 1075-1078.

13. Wolfe, J.M., Held, R., & Gwiazda, J. A reply to Nachmias. American Journal of Optometry and Physiological Optics 1982; 59: 848.

14. Wolfe, J.M. Hidden visual processes. Scientific American 1983; 248: 94-103.

15. Wolfe, J.M., & Held, R. Shared characteristics of stereopsis and the purely binocular process. Vision Research 1983; 23: 217-227.

16. Wolfe, J.M., Gwiazda, J., & Held, R. The meaning of non-monotonic psychometric functions in the assessment of infant preferential looking acuity. Vision Research 1983; 23: 917-920.

17. Wolfe, J.M. Influence of spatial frequency, luminance, and duration on binocular rivalry and abnormal fusion of briefly present, dichoptic stimuli. Perception 1983; 12: 447-456.

18. Wolfe, J.M. Afterimages, binocular rivalry, and the false fusion phenomenon. Perception 1983; 12: 439-445.

19. Wolfe, J.M. Reversing ocular dominance and suppression in a single flash. Vision Research 1984; 24: 471-478.

20. Wolfe, J.M. Global factors in the Hermann grid illusion. Perception 1984; 13: 33-40.

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**National Academy of Sciences Reports**

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2. National Academy of Sciences report "2011-2012 Assessment of the Army Research Laboratory". Authored by the Army Research Laboratory Technical Assessment Board Primary contribution, Chapter 3 "Human Research and Engineering Directorate" pp 44-60, release date 2013, ISBN 0-309-26899-0

**Book Reviews, Editorials, and other short pieces**

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**Thesis**

Wolfe JM On binocular single vision [dissertation]. Cambridge, MA: Massachusetts Institute of Technology

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305. Suzuki, M., Wolfe, J. M., Horowitz , T. S., & Noguchi, Y. (2012). Masking of target with illusory color-orientation misbinding. Paper presented at the 31st Annual Meeting of the Japanese Psychonomic Society.

306. Cunningham, C. A., & Wolfe, J. M. (2012). Lions or tigers or bears: Oh my! Hybrid visual and memory search for categorical targets. Paper presented at OPAM (Minneapolis, MN, Nov 2012) see also *Visual Cognition, 20*(9), 1024-1027.

307. Cunningham, C. A., & Wolfe, J. M. (2012). *Extending "Hybrid" Visual X Memory Search To Very Large Memory Sets And To Category Search*. Paper presented at the Annual meeting of the Psychonomic Society.

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309. Drew, T., Sherman, A. M., & Wolfe, J. M. (2012). *How does search through memory interact with the attentional blink?* Poster presented at the Annual meeting of the Psychonomic Society.

310. Evans, K. K., & Wolfe, J. M. (2012). *Can't remember the tree because of the forest: When context interferes with memory for objects*. Poster presented at the Annual meeting of the Psychonomic Society.

311. Vo, M. L., & Wolfe, J. M. (2012). *Searching for Invisible Objects in Visible Scenes*. Paper presented at the Annual meeting of the Psychonomic Society.

312. Wolfe, J. M., Hochberg, A., Schultz, K., & Young, G. S. (2012). *The perceptual consequences of dose reduction in an aneurysm segmentation task*. Paper presented at the Radiological Society of North America Annual Meeting.

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318. Cunningham, C. A., Wolfe, J. M., & Egeth, H. E. (2013). Incidental memory for potential targets vs. confirmed distractors. Journal of Vision, 13(9), 156. Poster given at the annual meeting of the Vision Sciences Society in Naples, FL.

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322. Wolfe, J. M., Olwal, A., Drew, T. (2013). "Understanding and attempting to improve search in volumetric space: How do radiologists search chest CT scans?" Talk presented at Medical Image Percep8on Society: : 8/14-16/13 Washington DC.

323. Suzuki, M., Wolfe, J. M., Horowitz, T. S., & Noguchi, Y. (2012). Masking target of visual search with illusory color-orientation misbinding. Japanese Psychonomic Society, 31, November 3-4, Fukuoka, Japan.

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325. Wolfe, J. M., & Boettcher, S. (2013). Hybrid Visual and Memory Search: Just How Ridiculously Flexible and Talented are You Anyway? . paper presented at the Annual Meeting of the Psychonomic Society, Toronto((abs 77)), 11/14-17/13.

326. Drew, T., Boettcher, S., & Wolfe, J. M. (2013). Hybrid Visual and Memory Search Remains Efficient When Visual Working Memory is Full. paper presented at the Annual Meeting of the Psychonomic Society, Toronto((abs 207)), 11/14-17/13.

327. Vo, M. L., Draschkow, D., Farmer, R., & Wolfe, J. M. (2013). Memory Representations Are Not Created Equal: Incidental Encoding During Object Search Outperforms Intentional Object Memorization. paper presented at the Annual Meeting of the Psychonomic Society, Toronto((abs 306)), 11/14-17/13.

328. Vo, M. L.-H., Draschkow, D., Josephs, E. L., & Wolfe, J. M. (2014). Seek and remember: Scene semantics interact with visual search to build better memories. . paper presented at the 56th Conference of Experimental Psychologists (TeaP), Giessen, Germany (3/31-4/2/2014).

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330. Aizenman, A., Drew, T., Georgian-Smith, D., & Wolfe, J. M. (2014). Comparing search strategy in breast tomosynthesis and 2D mammogram: an eye tracking study *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 56.418*

331. Boettcher, S., & Wolfe, J. M. (2014). Searching for the right word: Hybrid visual and memory search for words. *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 53.304*

332. Cain, M. S., Boettcher, S., & Wolfe, J. M. (2014). When Does the Aardvark Move to the Next Anthill? Foraging search with moving targets *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 53.307*

333. Drew, T., & Wolfe, J. M. (2014). Shuffling your way out of change blindness *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 62.26*.

334. Ehinger, K. A., & Wolfe, J. M. (2014). Foraging and navigating in a virtual orchard: Which tree do you visit next? . *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 26:568*.

335. Gil-Gómez de Liaño, B., Drew, M. R., Quiros, M., & Wolfe, J. M. (2014). Updating for free? Span and Updating tasks modulate Visual Search in a similar manner *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 53.305*

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337. Josephs, E. L., Draschkow, D., Vo, M. L., & Wolfe, J. M. (2014). Active visual search boosts memory for objects, but only when making a scene. *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 55.14*.

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341. Vo, M. L., & Wolfe, J. M. (2014). Scene syntactic priming boosts lexical access . *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 43.558*.

342. Wolfe, J. M., Drew, T., & Vo, M. L. (2014). You don't know where your eyes have been and that could be problem *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 56.417*.

343. Zhang, J., Fougnie, D., Gong, X., Alvarez, G. A., & Wolfe, J. M. (2014). Winter is coming: How humans forage in a temporally structured environment *paper presented at the Annual Meeting of the Vision Science Society, May 2014, 53.301*

344. Gil-Gómez de Liaño, B., Drew, T., Quirós, M., & Wolfe, J. M. (2014). Active Working Memory Tasks Interfere with Visual Search while Passive Tasks Do Not. *Paper presented at the Sepex-Sepneca 2014., 1-4 October, 2014*.

345. Drew, T., Wolfe, J. M., Birdwell, R. L., & Georgian-Smith, D. (2013). Comparing search in breast tomosynthesis and 2D mammograms: an eye-tracking study. *Paper Talk presented at American Roentgen Ray Society : San Diego, CA.*.

346. Fougnie, D., Zhang, J., Cormiea, S. M., Gong, X., Alvarez, G. A., & Wolfe, J. M. (2014). Winter is coming: How humans forage in a temporally structured environment *Paper presented at the European Conference on Visual Perception. Belgrade, Serbia, August 24-28, 2014*

347. Wolfe, J. M. (2014). Enhancing Visual Search by GEOINT Analysts. Paper presented at the NGA Academic Research Program (NARP) Symposium and Workshops. *Paper presented at the NGA Academic Research Program (NARP) Symposium and Workshops, Washington, DC, Sept 10-11, 2014*

348. Wolfe, J. M., & Ehinger, K. A. (2014). Enhancing Visual Search by GEOINT Analysts Part 2: GEOINT Analysis as a foraging task. *Paper presented at the NGA Academic Research Program (NARP) Symposium and Workshops, Washington, DC, Sept 10-11, 2014*

349. Becker, S. I., Venini, D., Retell, J. D., & Wolfe, J. M. (2014). Mirror blindness: Our failure to recognize the target in search for mirror-reversed shapes. *paper presented at Psychonomic Soc, Annual Meeting, Long Beach, CA Nov 20-23, 2014.*

350. Cain, M. S., Boettcher, S., & Wolfe, J. M. (2014). Hybrid Foraging Search: Visual Search for Multiple Examples of Multiple Target Types Held in Memory. *paper presented at Psychonomic Soc, Annual Meeting, Long Beach, CA Nov 20-23, 2014.*

351. Wolfe, J. M., Drew, T., & Boettcher, S. (2014). The (Minimal) Role of Familiarity in Hybrid Visual and Memory Search. *paper presented at Psychonomic Soc, Annual Meeting, Long Beach, CA Nov 20-23, 2014.*

352. Fougnie, D., Zhang, J., Cormiea, S. M., Gong, X., Alvarez, G. A., & Wolfe, J. M. (2014). Winter Is Coming: How Humans Forage in a Temporally Structured Environment. *paper presented at Psychonomic Soc, Annual Meeting, Long Beach, CA Nov 20-23, 2014.*

353. Josephs, E. L., Cain, M. S., Hidalgo-Sotelo, B., Cook, G., Chang, N., Ehinger, K. A., et al. (2015). When is stereopsis useful in visual search? *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

354. Sareen, P., & Wolfe, J. M. (2015). The tree in the bathroom: The role of inconsistent information in understanding the gist of a scene. *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

355. Aizenman, A., Thompson, M., Ehinger, K. A., & Wolfe, J. M. (2015). Visual search through a 3D volume: Studying novices in order to help radiologists. *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

356. Ehinger, K. A., & Wolfe, J. M. (2015). Foraging in satellite imagery: When is it time to move to the next map? *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

357. Cain, M. S., Josephs, E. L., & Wolfe, J. M. (2015). Keep on rolling: Visual search asymmetries in 3D scenes with motion-defined targets. *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

358. Wolfe, J. M., Cain, M. S., Ehinger, K. A., & Drew, T. (2015). Guided Search 5.0: Meeting the challenge of hybrid search and multiple-target foraging. *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

359. Gil-Gómez de Liaño, B. T., Drew, T., Rin, D. F., & Wolfe, J. M. (2015). Active working memory tasks interfere with inefficient search but NOT with efficient search, guided by bottom-up salience. *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

360. Drew, T., Aizenman, A. M., Thompson, M., Kovacs, M. D., Trambert, M., Reicher, Wolfe, J. M. (2015). Image shuffling saves time in mammography. *paper presented at the Annual Meeting of the Vision Science Society, May 2015.*

361. Evans, K. K., Schwartz, T. M., Georgian-Smith, D., Candelaria, R. P., Dryden, M. J., Haygood, T. M., et al. (2015). Varied Frequency Information in Mammography. Talk presented at Medical Image Perception Society: Ghent, Belgium. June 3-5, 2015.

362. Vo, M. L.-H. & Wolfe, J. M. (2015). Let me tell you where you looked! How much do people know about their own fixations? Presented at the 18th European Conference on Eye Movements, Austria. Aug. 17, 2015. Abstracts of the 18th European Conference on Eye Movements, 2015Journal of Eye Movement Research, 8(4):1.

363. Becker, S.I., Venini, D., Retell, J.D., Wardhani, I., & Wolfe, J.M. Mirror blindness in visual search for complex shapes and faces. Presented at the 18th European Conference on Eye Movements, Austria. Aug. 17, 2015. Abstracts of the 18th European Conference on Eye Movements, 2015Journal of Eye Movement Research, 8(4):1.

364. Wolfe, J M Enhancing Visual Search by GEOINT Analysts. Paper presented at NGA GEOINT Academic Research Summit, Washington, DC Sept 15-17, 2015

365. Cain, M. S., & Wolfe, J. M. (2015). Targets and Switching Between Trials in Hybrid Visual/Memory Searc. Paper presented at the Psychonomics Society Meeting, Chicago, Nov. 19-22.

366. Wolfe, J. M., Georgian-Smith, D., Cooper, J., & Haygood, T. M. (2015). Expert Perception of Scene Gist: Finding Breast Cancer in Less Than a Second. Paper presented at the Psychonomics Society Meeting, Chicago, Nov. 19-22.

367. Wolfe, J.M. (2016) Learning to be an expert at visual search, Network for the Science of Learning Awardees' Meeting Arlington, VA, Feb, 8-10, 2016

368. Nordfang, M., & Wolfe, J. M. (2016). Guided memory search: Results from concurrent visual and memory search through different categories. Oral presentation at International Meeting of Psychonomic Society, Granada, Spain. May, 2016

369. Wick, F. A., Garg, S., Alaoui-Soce, A., & Wolfe, J. M. (2016). Perception of dynamic scenes: What is your Heider capacity? [Perception of dynamic scenes: What is your Heider capacity?]. Paper presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

370. Evans, K. K., Cooper, J., Haygood, T. M., & Wolfe, J. M. (2016). The 'Gist' of the Abnormal in Radiology Scenes: Where is the Signal? Paper presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

371. Gil-Gómez de Liaño, B. T., Drew, T., Rin, D. F., & Wolfe, J. M. (2016). Paradoxical speeding of visual search by the inclusion of WM and LTM lures. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

372. Ehinger, K. A., & Wolfe, J. M. (2016). How is visual search guided by shape? Using features from deep learning to understand preattentive "shape space"es. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

373. Wolfe, J. M., Aizenman, A. M., Park, J., Jurgenson, L., & Ehinger, K. A. (2016). How did you hide my bunny? Using a genetic algorithm to investigate preattentive processing of shape in visual search. Paper presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

374. Alaoui-Soce, A., Cain, M. S., & Wolfe, J. M. (2016). Fitting two target templates into the focus of attention in a hybrid foraging task. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

375. Cain, M. S., & Wolfe, J. M. (2016). Precise Guided Search. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

376. Micheletto, R., Ehinger, K. A., & Wolfe, J. M. (2016). Role of simple primitive shapes in complex distractors: Do shared features affect search times? Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

377. Utochkin, I. S., & Wolfe, J. M. (2016). Visual search for changes in scenes creates long-term, incidental memory traces. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

378. Wu, C.-C., Alaoui-Soce, A., & Wolfe, J. M. (2016). If you see something, say something: Event monitoring capacity is low. Paper presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

379. Aizenman, A. M., Vo, M. L., & Wolfe, J. M. (2016). Losing track of your eyes while trying to find Waldo. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

380. Madrid, J., Cunningham, C. A., Robbins, A., Godwin, H. J., Wolfe, J. M., & Hout, M. C. (2016). Exploring the nature of mental representations in hybrid visual and memory search. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

381. Zou, B., Utochkin, I. S., & Wolfe, J. M. (2016). Binocularity and Visual Search – Revisited. Poster presented at Vision Sciences Society meeting, St. Petersburg, FL, May 12-18, 2016.

382. Wolfe, J. M., & Alaoui-Soce, A. (2016). Find any animal or this boot: Hybrid search for mixtures of specific and categorical targets. . paper presented at Psychonomic Soc, Annual Meeting, Boston, MA, Nov 18-20, 2016, abs #46.

383. Wick, F. A., Garg, S., Alaoui-Soce, A., & Wolfe, J. M. (2016). Perception of dynamic scenes. Poster presented at Psychonomic Soc, Annual Meeting, Boston, MA, Nov 18-20, 2016, abs #3184.

384. Aizenman, A. M., Drew, T., Georgian-Smith, D., & Wolfe, J. M. (2016). Patterns of eye movements in breast tomosynthesis and full field digital mammography: an eye tracking study. Paper presented at the RSNA, Chicago.

385. Kosovicheva, A. A., Feffer, J., Alaoui-Soce, A., Cain, M. S., & Wolfe, J. M. (2017). When does visual search move on?: Using the color wheel to measure the dynamics of foraging search. paper presented at the Annual Meeting of the Vision Science Society, May 2017, 23.3045

386. Zou, B., Liu, Y., & Wolfe, J. M. (2017). Effects of prior knowledge on visual search in depth paper presented at the Annual Meeting of the Vision Science Society, May 2017, 23.3043

387. Wu, C.-C., & Wolfe, J. M. (2017). Detecting more than one event at a time in multiple event tracking. paper presented at the Annual Meeting of the Vision Science Society, May 2017, 63.4030

388. Reijnen, E., Kühne, S., & Wolfe, J. M. (2017). Which Cereal Bar? Choose or Reject, does it Matter? paper presented at the Annual Meeting of the Vision Science Society, May 2017, 56.4072.

389. Chin, M., Evans, K. K., Wolfe, J. M., Bowen, J., & Tanaka, J. W. (2017). Inversion effects in the ability to classify mammograms in one second. paper presented at the Annual Meeting of the Vision Science Society, May 2017, 56.4065

390. Schill, H., Culpan, A.-M., Wolfe, J. M., & Evans, K. K. (2017). Detecting the "gist" of breast cancer in mammograms three years before the cancer appears. . paper presented at the Annual Meeting of the Vision Science Society, May 2017, 52.15, 11:45 am

391. Wick, F. A., & Wolfe, J. M. (2017). Multiple object tracking doesn't care if you are crossing the street or bouncing off the walls paper presented at the Annual Meeting of the Vision Science Society, May 2017, 42.14, 11:30 am

392. Aizenman, A., Kok, E. M., Vo, M. L., & Wolfe, J. M. (2017). If I showed you where you looked, you still wouldn't remember paper presented at the Annual Meeting of the Vision Science Society, May 2017, abstract 5.11, 5:15 pm

393. Wolfe, J. M., & Alaoui-Soce, A. (2017). How the Heck Did I Miss That? How to use the hybrid search paradigm to study "incidental finding" errors in radiology. paper presented at the Annual Meeting of the Vision Science Society, May 2017, abstract 23.3048.

394. Gil-Gómez de Liaño, B., Drew, T., Rin, D. F., & Wolfe, J. M. (2017). Variable Viewpoint Hybrid Search: Searching for the Object or the Image? . paper presented at the Annual Meeting of the Vision Science Society, May 2017, abstract 23.3032.

395. Alaoui-Soce, A., Zou, B., & Wolfe, J. M. (2017). Variable Viewpoint Hybrid Search: Searching for the Object or the Image? . paper presented at the Annual Meeting of the Vision Science Society, May 2017, abstract 23.3006

396. Kok, E. M., Aizenman, A., Vo, M. L., & Wolfe, J. M. (2017). If I showed you where you looked, you still wouldn't remember. paper presented at 19th European Conference on Eye Movements will take place at the Bergische Universität Wuppertal, August 20th to 24th, 2017.

397. Wolfe, J. M. (2017). Mixed hybrid search: A model system to study incidental finding errors in radiology. paper presented at the 2017 Medical Image Perception Meeting in Houston TX (July 12-15, 2017).

398. Schill, H., Culpan, A.-M., Wolfe, J. M., & Evans, K. K. (2017). Detecting the "gist" of breast cancer in mammograms. paper presented at the 2017 Medical Image Perception Meeting in Houston TX (July 12-15, 2017).

399. McEntee, M. F., Drew, M. R., Aizenmann, A., Carrigan, A. J., Ekpo, E., & Wolfe, J. M. (2017). Examining the 'gambler's fallacy' in radiology. paper presented at the 2017 Medical Image Perception Meeting in Houston TX (July 12-15, 2017).

400. Gandomkar, Z., Tapia, K., Lewis, S. J., Ekpo, E. U., Trieu, P., Evans, K. K., et al. (2018). Detection of the abnormal gist in the prior mammograms even with no overt sign of breast cancer. Breast Imaging: 14th International Workshop (IWBI 2018), Atlanta, Georgia, United States, Proc. of SPIE.

401. Wiegand, I., & Wolfe, J. M. (2017). Hybrid (combined Visual and Memory) Search in Aging. Paper presented at 2017 European Conference on Visual Perception (ECVP), Berlin, August 27-31.

402. Wolfe, J. M., Schill, H., & Alaoui-Soce, A. (2017). Modeling "incidental finding errors" in medical image perception…and failing to fix the problem. paper presented at 58th Annual Meeting of the Psychonomic Society, Vancouver, BC(Nov 9 -12, 2017).

403. Semizer, Y., Michel, M. M., Evans, K. K., & Wolfe, J. M. (2018). Textures as Global Signals of Abnormality in the Interpretation of Mammograms paper presented at the Annual Meeting of the Vision Science Society, May 2018.

404. Wick, F. A., Kreiman, G., & Wolfe, J. M. (2018). Two targets, held in memory, can guide search; four targets cannot. . paper presented at the Annual Meeting of the Vision Science Society, May 2018.

405. Schill, H., Wick, F. A., Cain, M. S., & Wolfe, J. M. (2018). Hybrid foraging meets navigation: Can augmented reality improve performance in real world search tasks? . paper presented at the Annual Meeting of the Vision Science Society, May 2018.

406. Muñoz-García, A. n. R., Wolfe, J. M., & Gil-Gómez de Liaño, B. T. (2018). Hybrid Foraging Performance is Related to Fluid Intelligence. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

407. Chin, M., Evans, K. K., Wolfe, J. M., & Tanaka, J. W. (2018). Gist Perception and Holistic Processing in Rapidly Presented Mammograms. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

408. Kim, G., Arkadiusz, S., Chen, J., Evans, K. K., & Wolfe, J. M. (2018). Training a Convolutional Neural Network to Detect the Gist of Breast Cancer. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

409. Wiegand, , I., & Wolfe, J. M. (2018). Hybrid visual and memory search is preserved in older age. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

410. Gil-Gómez de Liaño, B. T., Quirós-Godoy, M. a., Pérez-Hernández, E., Cain, M. S., & Wolfe, J. M. (2018). Understanding Visual Search and Foraging in Cognitive Development. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

411. Quirós-Godoy, M. a., Pérez-Hernández, E., Cain, M. S., Wolfe, J. M., & Gil-Gómez de Liaño, B. T. (2018). Individual Differences in Visual Search and Foraging in children. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

412. Utochkin, I. S., & Wolfe, J. M. (2018). How do 25,000+ visual searches change the visual system? Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

413. Westenberg, E., Wolfe, J. M., & Wiegand, I. (2018). Sequence Learning in Hybrid Visual Search. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

414. Nartker, M., & Wolfe, J. M. (2018). How NOT to cure the incidental finding problem in radiology. Poster presented at the Annual Meeting of the Vision Science Society, May 2018.

415. Wu, C. C., & Wolfe, J. M. (2018). Your hidden capacity revealed! The Multiple Object Awareness (MOA) paradigm. paper presented at Vision Sciences Society meeting, St. Petersburg, FL, May 2018.

416. Evans, K. K., & Wolfe, J. M. (2018). The Gist of a Mammogram Predicts Future Development of Cancer. paper presented at European Conference on Visual Perception, Trieste, Italy, Aug 2018.

417. Wolfe, J. M. (2018). Why Doesn't That Clever Computer Aided Detection System Work as Well as Theory Says It Should? . paper presented at 2018 Annual meeting of the Psychonomic Society, New Orleans (Nov 15-18, 2018).

418. Wolfe, J. M., & Wu, C.-C. (2018). Multiple Object Awareness. paper presented at 2018 Annual meeting of the Psychonomic Society, New Orleans (Nov 15-18, 2018).

419. Wolfe, J. M. (2018). HAICT: A novel methodology for testing human-AI collaborations paper presented at 2018 Annual meeting of the OPAM, New Orleans (Nov 15-16, 2018).

420. Wu, C.-C., & Wolfe, J. M. (2019). Useful Field of View shows why we miss the search target when we "look at" it. paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

421. Wick, F. A., Kreiman, G., & Wolfe, J. M. (2019). Computational strategies used during hybrid visual search. paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

422. Kosovicheva, A., & Wolfe, J. M. (2019). When do you find the next item?: Using occluders to uncover the time course of visual foraging paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

423. Muñoz-García, A. R., Wolfe, J. M., & Gil-Gómez de Liaño, B. T. (2019). Intelligence, Impulsivity and Selective Attention have something to tell us about Hybrid Foraging performance paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

424. Westenberg, E., Wolfe, J. M., & Wiegand, I. (2019). Explicit Sequence Learning in Hybrid Visual Search in Younger and Older Age paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

425. Nartker, M., & Wolfe, J. M. (2019). From the clinic to the lab and back: Fixing the problem of missed "incidental findings". paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

426. Wolfe, J. M., & Nartker, M. (2019). Playing nicely with your robot. paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

427. Schill, H., Wolfe, J. M., & Brady, T. F. (2019). Memory capacity meets expertise: increased capacity for abnormal images in expert radiologists paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

428. Khvostov, V. A., Utochkin, I. S., & Wolfe, J. M. (2019). Grouping does not help you to guide conjunction visual search, paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

429. Gil-Gómez de Liaño, B. T., Pérez-Hernández, E., Quirós-Godoy, M., & Wolfe, J. M. (2019). Is higher susceptibility to attentional deficits in children related to lower susceptibility to Inattentional Blindness in visual search, paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

430. Drew, T., Williams, L., Wolfe, J. M., & Wiegand, I. (2019). How do you know if you saw that? Electrophysiological correlates of searching through memory. paper presented at the Annual Meeting of the Vision Science Society, May 17-22, 2019.

431. Khvostov, V. A., Utochkin, I. S., & Wolfe, J. M. (2019). The role of categorical grouping and segmentation in the subset visual search task. paper presented at 42nd European Conference on Visual Perception, Leuven, Belgium, Aug 2019.

432. Wolfe, J. M., & Wu, C. C. (2019). Guided Search and the Functional Visual Field (FVF). paper presented at the 2019 meeting of the Psychonomic Society, Montreal, Nov, 2019, (paper presented by Todd Horowitz in my absence).

433. Gil-Gómez de Liaño, B. T., Wiegand, I., & Wolfe, J. M. (2019). Your Children and Your Parents are Not Optimal: Quitting Rules in Hybrid Foraging Over the Lifespan. paper presented at the 2019 meeting of the Psychonomic Society, Montreal, Nov, 2019.

434. Lyu, W., Levari, D. E., Little, D. S., & Wolfe, J. M. (2020). Prevalence effects on perceptual decisions: Category broadening, elevated miss rates, or both? *Journal of Vision, 20*(11), 720-720. doi: 10.1167/jov.20.11.720 (VSS 2020, on-line, COVID)

435. Suresh, S., Wu, C.-C., Gresch, D., & Wolfe, J. M. (2020). Multiple Functional Visual Fields (FVFs) surround the same fixation point during visual search. *Journal of Vision, 20*(11), 716-716. doi: 10.1167/jov.20.11.716 (VSS 2020, on-line, COVID)

436. Wu, C.-C., Kumle, L., Nartker, M., & Wolfe, J. (2020). What you don't see can help you: Image triage in human-AI interactions. *Journal of Vision, 20*(11), 519-519. doi: 10.1167/jov.20.11.519 (VSS 2020, on-line, COVID)

437. Gil-Gómez de Liaño, B., Nartker, M., Pérez-Hernández, E., & Wolfe, J. M. (2020). Grandma, didn't you see that gorilla? Age effects in inattentional blindness during a hybrid foraging game. *Journal of Vision, 20*(11), 448-448. doi: 10.1167/jov.20.11.448 (VSS 2020, on-line, COVID)

438. Wick, F., Wu, C.-C., Iyer, D., & Wolfe, J. (2020). Training Multiple Object Awareness (MOA). *Journal of Vision, 20*(11), 399-399. doi: 10.1167/jov.20.11.399 (VSS 2020, on-line, COVID)

439. Wolfe, J. (2020). Guided Search 6.0: An upgrade with five forms of guidance, three types of functional visual fields, and two, distinct search templates. *Journal of Vision, 20*(11), 303-303. doi: 10.1167/jov.20.11.303 (VSS 2020, on-line, COVID)

440. Williams, L., Wiegand, I., Lavelle, M., Wolfe, J., Fukuda, K., & Drew, T. (2020). What is the role of working memory in hybrid search?: Evidence from the Contralateral Delay Activity. *Journal of Vision, 20*(11), 261-261. doi: 10.1167/jov.20.11.261 (VSS 2020, on-line, COVID)

441. Nishikawa, R. M., D'Ardenne, N. M., Zuley, M. L., Wu, C.-C., & Wolfe, J. M. (2020). Comparison of Radiologists' Reading Errors between Digital Mammography and Breast Tomosynthesis. *paper presented at American Association of Physicists in Medicine.*

442. Liu, W., Romito, O. R., & Wolfe, J. M. (2020). Distinct non-target items regulate category boundary shifts at low target prevalence. *poster presented at OPAM annual meeting, November 18-19, 2020 (on-line, COVID)*

443. Wolfe, J. M., Lyu, W., Levari, D. E., Nartker, M., & Little, D. R. (2020). Having It Both Ways: How Decreasing Target Prevalence Can Produce Diametrically Opposed Effects on the Same Perceptual Decision. . *paper presented at the 2020 meeting of the Psychonomic Society, Nov 19-21 (on line / COVID).*

444. Gronau, N., Nartker, M., Yakim, S., Utochkin, I. S., & Wolfe, J. M. (2020). Semantic Content Allows Flexible Memory-Partitioning in Hybrid Search. *paper presented at the 2020 meeting of the Psychonomic Society, Nov 19-21 (on line / COVID).*

445. Gil-Gómez de Liaño, B. T., & Wolfe, J. M. (2020). Memory Effects in Hybrid Foraging Over the Lifespan. . *paper presented at the 2020 meeting of the Psychonomic Society, Nov 19-21 (on line / COVID)*.

446. Boettcher, S. E. P., Shalev, N., Wolfe, J. M., & Nobre, A. C. (2021). Right Place, Right Time: Spatiotemporal regularities guide attention in a dynamic setting. *63rd TeaP - Tagung experimentell arbeitender Psychologen (Conference of Experimental Psychologists), On-line (COVID era)*.

447. Ernst, D., & Wolfe, J. M. (2021). What fixation durations reveal about the functional visual field and target guidance. *63rd TeaP - Tagung experimentell arbeitender Psychologen (Conference of Experimental Psychologists), On-line (COVID era)*.