CURRICULUM VITAE

NAME MIGUEL PATRICIO ECKSTEIN
OFFICE Vision & Image Understanding Laboratory
Department of Psychological & Brain Sciences
University of California, Santa Barbara
eckstein@psych.ucsb.edu

EDUCATION 1987-1990 UNIVERSITY OF CALIFORNIA, BERKELEY
MAJORS: Bachelor's Degree, Physics & Psychology

1990-1994 UNIVERSITY OF CALIFORNIA, LOS ANGELES
MAJOR: Cognitive Psychology
MINOR: Measurement & Psychometrics
DEGREE: Ph.D.

POSITIONS

5 / 94 – 7/00	Research Scientist Department of Medical Physics & Imaging Cedars-Sinai Medical Center
1/ 96 – 1/97	Visiting Scientist Human Information Processing Branch NASA Ames Research Center
7/00-7/03	Assistant Professor Department of Psychology University of California, Santa Barbara
7/03-7/07	Associate Professor Department of Psychology University of California, Santa Barbara
7/07-present	Professor Department of Psychology (now Psychological and Brain Sciences), University of California, Santa Barbara
1/08-present	Professor Institute for Collaborative Biotechnologies University of California, Santa Barbara
7/19-present	Affiliated Faculty Department of Electrical and Computer Engineering University of California, Santa Barbara
7/2020	Duncan and Suzanne Mellichamp Endowed Chair in Mind and Machine Intelligence

5/21-present Affiliated Faculty
Department of Computer Science
University of California, Santa Barbara

7/22-present Distinguished Professor
University of California, Santa Barbara

RESEARCH INTERESTS

How does the brain rapidly process the visual world around us through complex computations and give rise to humans' incredible proficiency at finding objects, identifying faces, or diagnosing cancer from x-ray images? These perceptual tasks can be effortless and automatic for humans, giving the impression of simplicity. However, this intuition is misleading. Our vision is the result of over 500 million years of evolution. Over ¼ of the neural machinery of the human brain is dedicated to vision. I work on uncovering how the brain sees with every tool I can get hold of, including mathematics, behavioral psychophysics, eye tracking, brain imaging & electrophysiology, computer science, and observational work. I am interested in the underlying computations and their implementation in the brain. The investigations involve trying to understand vision, attention, eye movements and learning. Most of the time, this journey has me thinking and gathering data at the lab at the University of California Santa Barbara. It has taken me routinely to clinics to talk to radiologists. It occasionally has taken me across the world to study a variety of phenomena. How fishermen can discriminate fifteen species of fish on the ocean surface from a far distance, how honey bees can manifest human-like visual attention when finding food, or how congenital cataract patients undergoing surgery move their eyes.

AWARDS & FELLOWSHIPS

International, National, State, Society and Institution Awards & Honors:

1998 Optical Society of America Young Investigator Award
2000 Cedars Sinai Research Institute Young Investigator Award
2002 National Science Foundation CAREER Award
2008 National Academy of Sciences, Troland Research Award
2008 California State Senate Resolution (No. 475) relative to commending MP Eckstein
2008 Argentina National Congress Resolution commending MP Eckstein
2019 Guggenheim Fellowship
2020 Duncan and Suzanne Mellichamp Chair in Mind and Machine Intelligence

National Agency Travel Awards & Conference prizes:

1996 Center for Visual Sciences (Univ. of Rochester) Scholar Award to attend CVS
1997 National Eye Institute Fellowship Travel Award, ARVO Annual Meeting.
1998 Cum Laude Award for best poster at the SPIE, Medical Imaging Annual Meeting Image Perception & Observer Performance Conference.

Internal Institution Fellowships:

1991- 1994. Four-year recipient of UCLA Non-Resident Tuition Fellowship
1994 Recipient of the Cedars-Sinai Research Institute Fellowship

National Agency Travel Awards & Conference prizes (as advisor):

1999 National Eye Institute Fellowship Award for abstract 1999 ARVO Annual Meeting (co-author with winner Craig Abbey)
2004 Cum Laude Award for best poster at the SPIE, Medical Imaging Annual Meeting Image Perception & Observer Performance Conference, Metrics of medical image quality: task-based model observers vs. image discrimination/perceptual difference models (Co-author with Yani Zhang)
2005 Vision Sciences Society Travel Award for abstract: Optimal and suboptimal models of oddity search (co-author with winner: Wade Schoonveld)
2008 Cum Laude Award for best poster at SPIE, Medical Imaging Annual Meeting Image Perception & Observer Performance Conference, Perceptual assessment of stenosis deployment (co-author with Craig Abbey, Sheng Zhang, Wade Schoonveld)
2015 Vision Sciences Society Travel Award for abstract: Independent Contributions of Multiple Types of Scene Context on Eye Movement Guidance and Visual Search Performance (co-author with winner: Kathryn Koehler)
2019 Honorable Mention Award for best poster at SPIE, Medical Imaging Annual Meeting Image Perception & Observer Performance Conference, Evaluation of convolutional neural networks for search in $1/f^{2.8}$ filtered noise and digital breast tomosynthesis phantoms, (co-author with winner: Aditya Jannogaladda)

UC SANTA BARBARA SELECTED CAMPUS POSITIONS

2005-2006 Vice Chair, Psychological and Brain Sciences
2009-2010 Vice-Director Sage Center for the Study of the Mind
2011-2012 Vice Chair, Psychological and Brain Sciences
2009-present Executive Council Member, Sage Center for Study of the Mind
2014-2016, Co-Chair Neuroscience Initiative Faculty Search Committees
2015-2019, Neuroscience Research Institute, Advisory Board
2018-2019, Chair, Interdepartmental Program in Dynamical Neuroscience
2020-2021, Chair, Interdepartmental Program in Dynamical Neuroscience
2019-present, co-Director, UCSB Mind and Machine Intelligence Initiative

UC SANTA BARBARA EDUCATION/DIVERSITY CAMPUS SERVICE

2013-2019 Chair, UCSB Dream Scholar Mentorship Program (overseeing 40-60 undocumented UCSB students per quarter paired with UCSB faculty mentors).

2019-2023 Faculty Steering Committee, UCSB Dream Scholar Mentorship Program

2015-present Advisory Committee, ONDAS (Opening Doors for Accelerated Success) Center A center to assist first-generation college students and underrepresented minorities with core courses during their first years at UCSB

PROFESSIONAL ACTIVITIES

Conference/Society chair and conference program committees

1999-2001 Vice-Chair, Optical Soc. of America Annual Meeting, Vision Tech. Group
2001-2003 Chair, Optical Soc. of America Annual Meeting, Vision Tech. Group
2000-2006 Program Committee for the Society for Optical Engineering, Human Vision and Electronic Imaging, (San Jose, CA)
2000-2004 Program Committee for the Society for Optical Engineering, Medical Imaging Meeting, Image Perception & Performance (San Diego, CA)
2001 Program Committee for Medical Image Perception Conference, Virginia
2003 Program Committee 1st International Workshop on Visual Attention, San Miniato, Italy
2004-2006 Conference Chair, Society for Optical Engineering Medical Imaging: Image Perception, Performance and Technology Assessment (San Diego, CA)
2007 Fellowships Committee European Conference on Visual Perception
2007 Chair, 2nd International Workshop on Visual Attention, Buenos Aires
2009 Co-Chair, Medical Image Perception Society Conference, Santa Barbara, CA
2010-2014 Board of Directors, Vision Sciences Society
2011 Program Committee 3rd International Workshop on Visual Attention, India
2012-2014 Treasurer, Vision Sciences Society
2016 Review Committee European Conference on Visual Perception
2016 Chair, 5th International Workshop on Perceptual Learning, Calafate, Argentina
2017-2021 Co-Vice Chair Gordon Conference on Eye Movements
2021-2023 Co- Chair Gordon Conference on Eye Movements

Conference Session Chair and Symposium organization:

1997 Chair for the conference session, "Modeling Visual Signal Detection I" at the vision section of the SPIE meeting (Feb. 1997 SPIE, Medical Imaging Conference).
1997 Organizer and Chair for a Special Symposium: "Noise vs. Pattern Masking" at the Vision section of the 1997 Optical Society of America Annual Meeting in Long Beach, CA (Oct. 1997)
1997 Chair for the conference session "Models for visual Signal Detection" at the Far West Image Perception Conference (Arizona, Oct. 1997)
1998 Chair for session "Visual search and memory" at the Association for Research in Visual Ophthalmology (ARVO) Annual Meeting
1999 Chair for SPIE Image Perception conference session: Display Parameters and Performance I (Feb. 1999, San Diego)
2000 Chair for session "Visual search" at the Association for Research in Visual Ophthalmology (ARVO) Annual Meeting
2000 Chair for Special symposium, "Letter identification" at the annual meeting of the Optical Society of America
2001 Chair for session ROC and other performance assessment tools II, SPIE Medical Imaging
2001 Organizer of Optical Society of America Meeting Workshop on Visual Attention.
2002 Symposium Organizer for Fall Vision Meeting: Effects of Spatial Context
2003 Chair session "Observer models I: Clinical Applications", SPIE Medical Imaging

2004 Chair for the session "Model observers", SPIE Medical Imaging.
2004 Chair session: "Visual Search", European Conference on Visual Perception, Budapest.
2007 Chair session: "Visual Search", European Conference on Visual Perception, Arezzo
2007 Chair session: "Model Observers", Medical Image Perception Society Conference, Iowa
2013 Symposium Co-organizer, "Perceptual Learning" at Asian Annual Vision Meeting
2020 Co-Chair UC Santa Barbara 1st Mind and Machine Intelligence Summit
2021 Co-Chair UC Santa Barbara 2nd Mind and Machine Intelligence Summit: AI and Health
2022 Co-Chair UCSB 3nd Mind and Machine Intelligence Summit: AI and Neuroscience

Grant Review/Study Sections:

1998 National Institute of Health, Diagnostic Imaging Study Section (adhoc)
2000 NASA, Human Factors Study Section (adhoc)
2002 National Institute of Health, Diagnostic Imaging Study Section (adhoc)
2002-2007 NIH, Biomedical Imaging Technology, Study Section (Panel Member)
2003 National Science Foundation, Cognition and Perception (adhoc)
2004 National Institute of Health, Central Visual Processes (adhoc)
2004 Air Force (adhoc)
2006 National Science Foundation, Cognition and Perception (adhoc)
2007 NIH Conflict Study Section (Biomedical Imaging Technology)
2007 National Science Foundation, Cognition and Perception (adhoc)
2008 National Science Foundation Cognition & Perception (adhoc)
2009 NIH Conflict Study Section (Biomedical Imaging Technology)
2009 National Science Foundation, Cognition, Perception and Action (adhoc)
2010 NIH Conflict Study Section (Biomedical Imaging Technology)
2010 National Science Foundation, Cognitive Neuroscience (adhoc)
2011 NASA, Neurocognitive and Sensorimotor Panel
2011 NIH Biomedical Imaging Technology Program Project (adhoc)
2012 NIH Biomedical Imaging Technology Program Project & Study Section (adhoc)
2013 NIH Mechanisms of Sensory, Perceptual, and Cognitive Processes (adhoc)
2014 NIH National Institute of Biomedical Imaging and Bioengineering (R13; adhoc).
2016-2021 NIH, Sensory Processes & Cognitive Neuroscience (panel member)
2021-2022 NIH, Neuroscience of Basic Visual Processes (panel member)
2023 National Science Foundation (Smart Health, Adhoc)

Guest editor for special issues:

2002 Classification images, Journal of Vision
2007 Image Quality, Journal of Optical Society of America A
2012 Visual Attention, Vision Research
2013 Visual Search, Journal of Vision
2015 Perceptual Learning, Journal of Vision
2016 Computational models of Visual Attention, Vision Research
2018 Perceptual Learning,Vision Research

Editorial duties for journals:

2003-2006, Consulting Editor, Perception & Psychophysics
2004-2006, Editor, SPIE Proc. on Medical Imaging, Image Perception, Observer Performance and Technology Assessment
2005-2011, Vision Topic Editor, Journal of the Optical Society of America A
2006-present, Board of Editors, Journal of Vision
2017-2022, Guest Editor PNAS

ACTIVE RESEARCH GRANTS:

2021-2023 Noyce Trust Fund, Mind and Machine Intelligence PI: M.P. Eckstein, Co-I: William Wang

2018-2023 National Institute of Health, NIBIB, RO1: "Visual Search with 3D medical images", PI: M.P. Eckstein

2018-2022 National Institute of Health, NIBIB, RO1NIH/NIBIB: Modeling observer performance in low-dose CT assessments. PI: C.K. Abbey, Co-I: M.P. Eckstein

2019-2022 US ARMY, Improving Machine Intelligence Through Understanding and Optimizing Integration of Humans and Machines, Co-PIs: Eckstein, Grafton, Wang

PAST RESEARCH GRANTS:

2019-2021 National Institute R21: Neurocognitive basis of attention and eye movement guidance in the real world scenes, PI: A. Ghuman, Co-I: M.P. Eckstein

2015-2020 National Institute of Health, RO1NIH/NIBIB, RO1: "Assessment of medical image quality with foveated model observers", PI: M.P. Eckstein

2013-2016, National Institute of Health, National Eye Institute, R21: "Neural representations of scene context during search", PI: M.P. Eckstein

2013-2017, Department of Defense, "Predicting perceptual decisions and learning from human brain activity using machine learning algorithms from neural activity", PI: M.P. Eckstein

2015-2018, Department of Defense, "Supervisory Controller for Optimal Role Allocation for Cueing of Human Operators", Co-PI: M.P. Eckstein, F. Bullo

2016-2018 STTR Navy, "Object Cueing Using Biomimetic Approaches to Visual Information Processing", PI: Eckstein, UCSB

2016-2017 National Geospatial Agency: "Human and machine-enabled group decision for data limited visual search", PI: M.P. Eckstein

2010-2014 National Institute of Health, National Eye Institute, RO1: "Perceptual learning: human vs. optimal Bayesian", PI: M.P. Eckstein

2011-2014 National Geospatial Agency: “Human and machine-enabled group decision for data limited visual search”, PI: M.P. Eckstein

2009-2013, Department of Defense, “Predicting perceptual decisions and learning from human brain activity using machine learning algorithms from neural activity”, PI: M.P. Eckstein

2010-2013, Department of Defense, “Adaptive Integration and Optimization of Automated and Neural Processing Systems”, CO-I: M.P. Eckstein; PI: B. Giesbrecht

2008-2012, National Science Foundation, “The effect of cues on multiple fixation visual search”, PI: M.P. Eckstein

2011-2012 Eye Com Corporation: “Neural Correlates of Changes in Cognitive States Measured with Portable Systems”

2005-2011 National Institute of Health, RO1: “Model observer optimization of coronary angiograms”, PI: M.P. Eckstein

2004-2010 National Institute of Health, National Eye Institute, RO1: “Perceptual learning: human vs. optimal Bayesian”, PI: M.P. Eckstein

2006-2008 National Geospatial Agency: “Context effects on change detection” PI: M.P. Eckstein

2002-2008, National Science Foundation CAREER Grant: “Quantitative testing of models of visual attention during search”, PI: M.P. Eckstein

1996-2004 NIH-RO1: “Model observer optimization of coronary angiograms” PI: M.P. Eckstein

1999-2003 NASA/ARC/AFH, “Quantitative modeling for saccadic targeting during search”, PI: M.P. Eckstein.

1998-2000 NASA/ARC/AFH, “Measuring the relationship between perceived location and saccadic targeting; PI: M.P. Eckstein

PUBLICATIONS

Submitted:

Han, N., Eckstein M.P., Inferential Eye Movements Control While Following Dynamic Gaze (2022)

Jonnalagadda, A., Wang, W., & Eckstein, M. P. FoveaTer: Foveated Transformer for Image Classification. arXiv preprint arXiv:2105.1417 (2022)

Srivastava, S., Wang, W., & Eckstein, M. P. A Feedforward Convolutional Neural Network with a Few Million Neurons Learns from Images to Covertly Attend to Cues and Context like

Humans and an Optimal Bayesian Observer (2022)

Chakravarthula, P., Eckstein, M.P, A preference to look closer to the eyes is associated with a position-invariant face neural code, (2022)

Klein, D.S, Lago, M.A., Abbey, C.K., Eckstein, M.P., A 2D synthesized image improves the 3D search for foveated visual systems (2022)

Tsank, Y., Eckstein M.P., Foveated Convolutional Neural Networks and Ideal Observers to Understand the Role of Eye Movements and Configural Representations in Processing Faces with Scrambled Features| (2022)

High impact factor journal publications:

Welbourne, L. E., Jonnalagadda, A., Giesbrecht, B., & Eckstein, M. P. The transverse occipital sulcus and intraparietal sulcus show neural selectivity to object-scene size relationships. Communications Biology, 4(1), 1-14, (2021)

Lago, M. A., Jonnalagadda, A., Abbey, C. K., Barufaldi, B. B., Bakic, P. R., Maidment, A. D., .& Eckstein, M. P. Under-exploration of Three-Dimensional Images Leads to Search Errors for Small Salient Targets. Current Biology, (2021)

Lago, M. A., Abbey, C. K., & Eckstein, M. P. Foveated Model Observers for Visual Search in 3D Medical Images. IEEE Transactions on Medical Imaging, 40(3), 1021-1031 (2020)

Rosedahl, LA, Eckstein, MP, Ashby, F.G., Retinal-specific category learning, Nature Human Behaviour, 2 (7), 500, (2018)

Eckstein, M.P., Koehler, K., Akbas, E., Welbourne, L., Humans but not deep neural networks miss giant targets in scenes, Current Biology, 27, 2827.2832. (2017)

Juni, M., Eckstein M.P., The wisdom of the crowds for visual search, Proceedings of the National Academy of Sciences, 201610732, (2017)

Eckstein, M.P., Probabilistic computations for attention, eye movements, and search, Annual Review of Vision Science 3, 319-342, (2017)

Akbas, E., Eckstein, M.P., Object Detection with a Foveated Search Model, PLOS Computational Biology, 13 (10), e1005743, (2017)

Tsank Y., Eckstein, M.P., Domain specificity of oculomotor learning after changes in sensory processing, Journal of Neuroscience, 1208-17, (2017)

Diaz, I., Abbey, C.K., Timberg, P.A.S., Eckstein, M.P., Verdun, F.R., Castella, C., Bochud, F. Derivation of an Observer Model Adapted to Irregular Signals Based on Convolution Channels, Medical Imaging, IEEE Transactions on 34 (7), 1428-1435 (2015)

Ludwig, C. J., Davies, J. R., & Eckstein, M. P. (2014). Foveal analysis and peripheral selection during active visual sampling. Proceedings of the National Academy of Sciences, 111(2), E291-E299 (2014)

Cecotti, H., Eckstein, M.P., Giesbrecht B., Single-trial classification of event-related potentials in rapid serial visual presentation tasks using supervised spatial filtering, Neural Networks, and Learning Systems, IEEE Transactions on 25, 2030-2042, (2014)

Peterson, M. F., & Eckstein, M. P. Individual Differences in Eye Movements During Face Identification Reflect Observer-Specific Optimal Points of Fixation, Psychological Science, 24(7), 1216-25, (2013)

Preston, T. J., Guo, F., Das, K., Giesbrecht, B., & Eckstein, M. P. Neural Representations of Contextual Guidance in Visual Search of Real-World Scenes, The Journal of Neuroscience, 33(18), 7846-7855 (2013)

Peterson, M. F., & Eckstein, M. P. Looking just below the eyes is optimal across face recognition tasks. Proceedings of the National Academy of Sciences, 109(48), E3314-E3323 (2012).

Eckstein M.P., Das K., Pham, B.T., Peterson M., Abbey, C.K., Sy J., Giesbrecht, B., Neural decoding of collective wisdom with multi-brain computing, Neuroimage, 59. 94-108, (2012)

Guo F., Preston T.J., Das K., Giesbrecht B., Eckstein M.P., Feature-independent neural coding of target detection during search of natural scenes, Journal of Neuroscience, 32, 9499-510, (2012)

Zhang S., Eckstein M.P., Evolution and Optimality of similar neural mechanisms for perception actions during search, PLoS Comput Biol., 9, 6, (2010)

Das K., Giesbrecht B., Eckstein M.P., Predicting variations of perceptual performance across individuals from neural activity using pattern classifiers, Neuroimage, 51(4):1425-37 (2010).

Eckstein, M.P., Beutter, B.R., Pham, B.T., Shimozaki, S.S., Stone, L.S., Similar neural representations of the target for saccades and perception during search, Journal of Neuroscience, 27, 1266-1270 (2007)

Zhang, Y., Pham, B.T.., Eckstein, M.P., The effect of non-linear human visual system components on channelized Hotelling model observer performance, IEEE Transactions on Medical Imaging, 25, 1348-1362, (2006)

Eckstein, M.P., Drescher, B.A., Shimozaki, S.S., Attentional cues in real scenes, saccadic targeting and Bayesian priors, Psychological Science, 17, 973-980 (2006)

Zhang, Y., Pham, B.T., Eckstein, M.P., Automated optimization of JPEG 2000 Encoder Options Based on Model Observer Performance for detecting variable signals in X-ray coronary angiograms, IEEE Transactions on Medical Imaging, 23, 459-474, (2004)

Caspi, A., Beutter, B.R., Eckstein, M.P., The time course of visual information accrual guiding eye movement decisions, Proceedings of the National Academy of Sciences, 101: 13086-13090, (2004)

Abbey, C.K., Eckstein, M.P., Optimal shifted estimates of human-observer templates in two-

alternative forced-choice experiments, IEEE Transactions on Medical Imaging, 21, 429-440, (2002)

Eckstein, M.P., The lower efficiency for conjunctions is due to noise and not serial attentional processing, Psychological Science, 9, 111-118, (1998)

High Impact Peer-Reviewed Conference Proceedings (h-5 index > 100)

Fu, T. J., Wang, X. E., Grafton, S. T., Eckstein, M. P., & Wang, W. Y. (2022). M3L: Language-based Video Editing via Multi-Modal Multi-Level Transformers. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 10513-10522).

Fu, T. J., Wang, X. E., Peterson, M. F., Grafton, S. T., Eckstein, M. P., & Wang, W. Y., Counterfactual vision-and-language navigation via adversarial path sampler. In European Conference on Computer Vision (pp. 71-86). Springer, Cham, (2020)

Fu, T. J., Wang, X., Grafton, S., Eckstein, M., & Wang, W. Y., Iterative Language-Based Image Editing via Self-Supervised Counterfactual Reasoning. In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP) (pp. 4413-4422), (2020)

Deza A, Surana A., Eckstein, M.P., Assessment of Faster R-CNN in Man-Machne Collaborative Search, Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 3185-3194, (2019)

Deza, A., Eckstein, M.P. Can Peripheral Representations Improve Clutter Metrics on Complex Scenes?, Neural Information Processing Systems (NIPS), 29, (2016)

Shanmuga Vadivel, K., Ngo, T., Eckstein, M.P., Manjunath, B.S. Eye tracking assisted extraction of attentionally important objects from videos Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 3241-3250, (2015)

Karthikeyan, S., Jagadeesh, V., Shenoy, R., Eckstein, M. and Manjunath, B.S., From Where and How to What We See, Proc. IEEE International Conference on Computer Vision and Pattern Recognition, Sydney, Dec. (2013)

Specialty Journal Articles, Book Chapters, Reviews, Special Issue Introductions:

Han, N. X., Eckstein. Gaze-cued shifts of attention and microsaccades are sustained for whole bodies but are transient for body parts. Psychonomic Bulletin & Review 1-25 (2022)

Treviño, M., Birdsong, G., Carrigan, A., Choyke, P., Drew, T., Eckstein, M., ... & Wolfe, J. M. Advancing Research on Medical Image Perception by Strengthening Multidisciplinary Collaboration. JNCI Cancer Spectrum, 6(1), (2022)

Han, N. X., Chakravarthula, P. N., and Eckstein, M. P., Peripheral facial features guiding eye movements and reducing fixational variability. Journal of Vision, 21(8), 7-7. (2021)

Meghdadi, A. H., Giesbrecht, B., & Eckstein, M. P., EEG signatures of contextual influences on visual search with real scenes. Experimental Brain Research, 1-13, (2021)

Chakravarthula, P. N., Tsank, Y., & Eckstein, M. P. Eye movement strategies in face ethnicity categorization vs. face identification tasks. Vision Research, 186, 59-70, (2021)

Abbey, C. K., Lago, M. A., & Eckstein, M. P. (2021). Comparative observer effects in 2D and 3D localization tasks. Journal of Medical Imaging, 8(4), 041206.

Ba, A., Shams, M., Schmidt, S., Eckstein, M. P., Verdun, F. R., & Bochud, F. O., Search of low-contrast liver lesions in abdominal CT: the importance of scrolling behavior. Journal of Medical Imaging, 7(4), 045501, (2020)

Lago, M.A., Sechopoulos, I., Bochud, F.O., Eckstein, M.P., Measurement of the useful field of view for single slices of different imaging modalities and targets, Journal of Medical Imaging 7 (2), 022411, (2020)

Schauder, K.B., Park, W.J., Tsank, Y., Eckstein, M.P., Tadin, D., Bennetto, L., Initial eye gaze to faces and its functional consequence on face identification abilities in autism spectrum disorder, Journal of Neurodevelopmental Disorders 11 (1), 1-20, (2019)

Brennan, P.C., Ganesan, A., Eckstein, M.P., Ekpo, E.U., Tapia, K., Mello-Thoms, C, Juni, M., Benefits of Independent Double Reading in Digital Mammography: A Theoretical Evaluation of All Possible Pairing Methodologies, Academic Radiology (2018)

CK Abbey, C.K., Samuelson, F.W., Zeng, R., Boone, J.M., Eckstein, M.P., Myers, K, Classification images for localization performance in ramp-spectrum noise, Medical Physics 45 (5), 1970-1984 (2018)

Eckstein, M. P., Yu, C., Sagi, D., Carrasco, M., & Lu, Z. L. (2018). Introduction to Special issue on perceptual learning. Vision Research, 152, 1.

Koehler, K., Eckstein M.P. Temporal and Peripheral Extraction of Contextual Cues from Scenes during Visual Search, 17 (2), 16-16, Journal of Vision, (2017)

Koehler, K, Eckstein M.P., Beyond Scene Gist: Object guide visual search more than backgrounds, Journal of Experimental Psychology, Human Perception and Performance, 43, 6, 1177, (2017)

Ba, A., Eckstein, M.P., Racine, D., Ott, J.G. ,Verdun, F., Kobbe-Schmidt, S., Bochud, F. Anthropomorphic model observer performance in three-dimensional detection task for low-contrast computed tomography, Journal of Medical Imaging, 3, 011009, (2016)

Juni, M.Z., Eckstein, M.P. Flexible human collective wisdom. Journal of Experimental Psychology: Human Perception and Performance, 41, (2015)

Tsotsos, J.K., Eckstein, M.P., Landy, M.S, Computational models of visual attention. Vision Research, 116, 93, (2015)

Or, C.C.F., Peterson, M.P., Eckstein M.P., Initial eye movements during face identification are optimal and similar across cultures, Journal of Vision 15 (13), 12-12, (2015)

Eckstein, M.P., Schoonveld, W., Zhang, S., Mack, S.C., Akbas, E. Optimal and human eye movements to clustered low value cues to increase decision rewards during search, Vision Research 113, 137-154, (2015)

Kasper, R.W., Grafton, S.T., Eckstein, M.P., Giesbrecht B., Multimodal neuroimaging evidence linking memory and attention systems during visual search cued by context Annals of the New York Academy of Sciences 1339 (1), 176-189, (2015)

Kurki, I., & Eckstein, M. P. Template changes with perceptual learning are driven by feature informativeness. Journal of Vision, 14(11), 6, (2014)

Peterson, M. F., & Eckstein, M. P. Learning optimal eye movements to unusual faces. Vision Research, 99, 57-68 (2014)

Koehler, K., Guo, F., Zhang, S., & Eckstein, M. P. What do saliency models predict? Journal of Vision, 14(3), 14. (2014)

Kasper, R. W., Cecotti, H., Touryan, J., Eckstein, M. P., & Giesbrecht, B. Isolating the neural mechanisms of interference during continuous multisensory dual-task performance. Journal of Cognitive Neuroscience, 26(3), 476-489 (2014)

Abbey, C. K., & Eckstein, M. P. Observer efficiency in free-localization tasks with correlated noise. Frontiers in Psychology, 5, (2014)

Eckstein, M. P., Mack, S. C., Liston, D. B., Bogush, L., Menzel, R., & Krauzlis, R. J. Rethinking human visual attention: Spatial cueing effects and optimality of decisions by honeybees, monkeys and humans, Vision Research, 85:5-19 (2013)

Carrasco, M., Eckstein, M., Krauzlis, R., & Verghese, P. Attentional modulation: Target selection, active search and cognitive processing, Vision Research, 85, 1 (2013)

Abbey, C. K., Eckstein, M. P., & Boone, J. M. Estimating the relative utility of screening mammography. Medical Decision Making, 33(4), 510-520 (2013)

Shimozaki S.S., Schoonveld W.A., Eckstein M.P., A unified Bayesian observer analysis for set size and cueing effects on perceptual decisions and saccades, Journal of Vision, 22, (2012)

Eckstein M.P, Visual Search: a retrospective, Journal of Vision, 11, (2011)

Mack S., Eckstein M.P., Object co-occurrence serves as a contextual cue to guide and facilitate visual search in a natural viewing environment, Journal of Vision, 11, (2011).

Peterson M.F., Das K., Sy J.L., Li S., Giesbrecht B., Kourtzi Z., Eckstein M.P., Ideal observer analysis for task normalization of pattern classifier performance applied to EEG and fMRI data, Journal of the Optical Society of America A, 27, 2670-83, (2010)

Abbey C.K., Eckstein M.P., Observer Models as a Surrogate to Perception Experiments The Handbook of Medical Image Perception (E. Samei and E.A. Krupinski, Ed.s). Cambridge University Press, New York, (2010).

Trenti E.J., Barraza J.F., Eckstein M.P. Learning motion: Human vs. optimal Bayesian learner, Vision Research, 50(4):460-72, (2010)

Abbey C.K., Eckstein M.P., Boone J.M., An Equivalent Relative Utility Metric for Evaluating Screening Mammography, Medical Decision Making, 30(1):113-22, (2010)

Kasper, R., Das, K., Eckstein, M. P., Giesbrecht, B. Decoding information processing when attention fails: An electrophysiological approach. In T. Marek, W. Karwowski, & V. Rice (Eds), Advances in Understanding Human Performance: Neuroergonomics, Human Factors, and Special Populations. CRC Press/Taylor & Francis. (2010)

Das, K., Li, S., Giesbrecht, B., Kourtzi, Z., Eckstein, M. P., Predicting perceptual performance from neural activity. In T. Marek, W. Karwowski, & V. Rice (Eds), Advances in Understanding Human Performance: Neuroergonomics, Human Factors, and Special Populations. CRC Press/Taylor & Francis (2010)

Eckstein MP, Peterson MF, Pham BT, Droll JA., Statistical decision theory to relate neurons to behavior in the study of covert visual attention, Vision Research, 49, 1097-128, (2009)

Droll J.A., Eckstein, M.P., Gaze control and memory for objects while walking in a real world environment, Visual Cognition, Special Issue on Eye Guidance in Natural Scenes (2009)

Zhang S., Abbey C.K., Eckstein M.P., Virtual evolution for visual search in natural images results in behavioral receptive fields with inhibitory surrounds, Visual Neuroscience, 26, 93-108, (2009)

Droll J.A., Abbey C.K., Eckstein M.P., Learning cue validity through performance feedback. Journal of Vision, 19, 9(2):18.1-23, (2009)

Abbey C.K., Eckstein M.P., Frequency tuning of perceptual templates changes with noise magnitude., J Optical Society of America A, 26, B72-83, (2009)

Castella C., Eckstein M.P., Abbey C.K., Kinkel K., Verdun F.R., Saunders R.S., Samei E., Bochud F.O., Mass detection on mammograms: influence of signal shape uncertainty on human and model observers, Journal of the Optical Society of America A, 26, 425-36, (2009)

Peterson M.F., Abbey C.K., Eckstein M.P., The surprisingly high human efficiency at learning to recognize faces, Vision Research, 49, 301-14 (2009).

Stone L.S., Liston D., Beutter B.R., Eckstein M.P., Oculomotor Control: Perception and eye movements, New Encyclopedia of Neuroscience, edited by Larry Squire et al, Elsevier, (2008)

Abbey C.K., Pham B.T., Shimozaki S.S., Eckstein M.P., Contrast and stimulus effects in rapid learning of a visual task, Journal of Vision, 8,2, (2008)

Castella, C., Kinkel, K., Descombes, F., Eckstein, M.P., Sottas, P., Verdun, F.R. and Bochud, F.O., Mammographic texture synthesis: second-generation clustered lumpy backgrounds using a genetic algorithm, Optics Express, 16, 7595-7607, (2008)

Shimozaki, S.S., Chen, K., Eckstein, M.P., Probing the temporal dynamics of attention to the periphery with classification movies, Journal of Vision, 7,1-20 (2007)

Abbey, C.K., Eckstein M.P., Classification images for simple detection and discrimination tasks in correlated noise, Journal of the Optical Society of America A, 24, 110-124 (2007)

Castella, C., Abbey, C.K., Eckstein, M.P., Verdun, F.R., Kinkel, K., Bochud, F.O., Human linear template with mammographic backgrounds estimated with genetic algorithm, Journal of the Optical Society of America A, 24, 1-12 (2007)

Castella C, Kinkel K, Eckstein MP, Sottas PE, Verdun FR, Bochud FO., Semiautomatic mammographic parenchymal patterns classification using multiple statistical features. Acad Radiol. 2014, 1486-1499, (2007)

Schoonveld, W., Shimozaki, S.S., & Eckstein, M.P., Optimal observer model of single-fixation oddity search predicts a shallow set-size function. Journal of Vision, 7(10):1, 1-16, (2007)

Ludwig, C.J., Eckstein, M.P., Beutter, B.R., Limited flexibility in the filter underlying saccadic targeting, Vision Research, 47, 280-288, (2007)

Zhang, Y., Pham, B.T., Eckstein M.P., Evaluation of internal noise methods for Hotelling observer models, Medical Physics, 34, 3312-3322 (2007)

Shimozaki, S, Kingstone, A, Olk, B, Stowe, R, Eckstein, M.P., Classification images of two right hemisphere patients: A window into the attentional mechanisms of spatial neglect, Brain Research, 29, 1080, 26-52. (2006)

Zhang, Y., Abbey, C.K., Eckstein M.P., Adaptive mechanisms for visual detection in statistically non-stationary oriented noise, Journal of the Optical Society of America A., 23, 1549-1558, (2006)

Abbey, C.K., Eckstein, M.P., Classification images for detection, contrast discrimination, and identification tasks with a common ideal observer. Journal of Vision, 6, 335-355, (2006)

Shimozaki, S.S., Eckstein, M.P., Abbey, C.K. Spatial profiles of local and nonlocal effects upon contrast detection/discrimination from classification images, Journal of Vision 28, 45-57 (2005)

Zhang, Y., Pham, B.T., Eckstein, M.P., Task-based model/human observer evaluation of SPIHT wavelet compression with human visual system-based quantization. Academic Radiology, 12, 324-36 (2005)

Zhang, Y., Pham, B.T., Eckstein, M.P., Evaluation of JPEG 2000 encoder options: human and model observer detection of variable signals in X-ray coronary angiograms. IEEE Trans Med Imaging.23: 613-32, (2004)

Bochud, F.O., Abbey, C.K., Eckstein, M.P., Search for lesions in mammograms: statistical characterization of observer responses, Medical Physics, 31, 24-36, (2004)

Eckstein, M. P., Abbey, C. K., Pham, B. T., & Shimozaki, S. S. Perceptual learning through optimization of attentional weighting: Human versus optimal Bayesian learner. Journal of Vision, 4(12), 1006-1019, (2004)

Eckstein, M.P., Pham B.T., Shimozaki, S.S., The footprints of visual attention during search with 100% valid and 100% invalid cues, Vision Research, 40, 1193-207, (2004)

Eckstein, M.P., Active Vision, Perception, 33, (2004)

Baldassi, S, Burr D, Carrasco M, Eckstein M, Verghese P., Visual Attention, Vision Research, 44,1189-91, (2004)

Cameron, EL, Tai JC, Eckstein MP, Carrasco M., Signal detection theory applied to three visual search tasks--identification, yes/no detection and localization, Spatial Vis., 17:295-325, (2004)

Eckstein, M.P., Bartroff J.L., Abbey, C.K., Whiting, J.S., Bochud, F.O., Automated computer evaluation and optimization of image compression of x-ray coronary angiograms for signal known exactly detection tasks, Optics Express, 11, 460-475, (2003)

Shimozaki, S. S., Eckstein, M. P., & Abbey, C. K., Comparison of two weighted integration models for the cueing task: linear and likelihood. Journal of Vision, 3(3), 209-229, http://journalofvision.org/3/3/3/, DOI 10.1167/3.3.3., (2003)

Beutter, B.R., Eckstein, M.P., Stone, L.S., Saccadic and perceptual performance in visual search tasks. I. Contrast detection and discrimination. J Opt Soc Am A Opt Image Sci Vis, 20, 1341-55, (2003)

Murray, R.., Beutter, B.R., Eckstein, M.P., Stone, L.S., Saccadic and perceptual performance in visual search tasks. II. Letter discrimination, J Opt Soc Am A Opt Image Sci Vis., 20,:1356-70, (2003)

Shimozaki, S.S., Eckstein, M.P., & Abbey, C.K., An ideal observer with channels vs. feature independent processing of spatial frequency and orientation in visual search performance. J. Opt. Soc. Am. A Image Sci Vis., 20, 2197-2215, (2003)

Shimozaki, S.S., Eckstein M.P., Abbey, C.K., Stimulus information contaminates summation tests of independent neural representation of features, Journal of Vision, 2(5), http://journalofvision.org/2/5/1/, (2002)

Eckstein, M.P., Ahumada, Albert Jr. Classification images: A tool to analyze visual strategies. Journal of Vision, 2(1), http://journalofvision.org/2/1/3 , (2002)

Eckstein, M.P., Shimozaki, S.S., Abbey, C.K., The footprints of visual attention in the Posner paradigm revealed by classification images. Journal of Vision, 2(1), 25-45, http://journalofvision.org/2/1/3 (2002)

Abbey, C. K. & Eckstein, M. P. Classification image analysis: Estimation and statistical inference for two-alternative forced-choice experiments. Journal of Vision, 2(1), 66-78, http://journalofvision.org/2/1/5 (2002)

Shimozaki, S.S. , Thomas J.P. , Eckstein, M.P., Effects of luminance oscillations on simulated lightness discriminations. Perception and Psychophysics, 63, 1048-1062 (2001)

Eckstein, M.P., Beutter, B.R., Stone, L.S., The information limits of saccadic targeting during visual search, Perception, 30, 1389-1401 (2001)

Eckstein, M.P., The perception of medical images: 1941-2001. Optics and Photonics News, 12, 34-40, (2001)

Eckstein, M. P., Thomas, J.P, Palmer, J., Shimozaki, S.S., A signal detection model predicts effects of set size on visual search accuracy for feature, conjunction, triple conjunction and disjunction displays, Perception & Psychophysics, 62,425-451 (2000)

Eckstein, M.P., Abbey, C.K., Bochud, F.O., Practical guide to model observers in synthetic and real noisy backgrounds, in Handbook of Image Perception, Physics and Psychophysics, Editors, J. Beuttel, SPIE Press, (2000)

Eckstein, M.P., Bochud F.O., Abbey, C.A., Visual signal detection in structured backgrounds IV. Figures of merit for model observers in multiple alternative forced choice with response correlations, Journal of the Optical Society of America A, 17, 206-217, (2000)

Bochud, F.O., Abbey, C.A., Eckstein, M.P., Visual signal detection in structured backgrounds III. Calculation of figures of merit for model observers in statistically non-stationary backgrounds, Journal of the Optical Society of America A, 17, 193-216, (2000)

Abbey, C.K., Eckstein, M.P., Derivation of a detectability index for correlated responses in multiple-alternative forced-choice experiments. J. Opt. Soc. Am. A. 17(11):2101-4. (2000).

Morioka, C.A., Abbey, C.K., Eckstein, M.P., R. Close, J.S. Whiting, and M. LeFree, Simulating coronary arteries in x-ray angiograms, Medical Physics, 27(10):2438-2444, (2000)

Carrasco, M., Penpeci-Talgar, C., Eckstein, M.P., Spatial covert attention increases contrast sensitivity across the CSF: support for signal enhancement, Vision Research, 40, 1203-1215, (2000)

Shimozaki, S.S., Eckstein, M.P., Thomas, J.P., The maintenance of lightness for an object, Journal of Experimental Psychology, 25, 1433-1453, (1999)

Eckstein, M.P., Bartroff, J.L., Morioka, C.A.., Vodopich, D.J., Whiting, J.S, Feature stabilized digital x-ray coronary angiograms improve human visual detection in JPEG compressed images, Optics Express, 6, 193-199, (1999)

Bochud, F. O., Abbey, C.K., Eckstein, M.P., Statistical texture synthesis of mammographic images with clustered lumpy backgrounds, Optics Express, 4, 33-43, (1999)

Morioka, C.A., Eckstein, M.P., Bartroff, J.L., Hausleiter J., Whiting, J.S., Observer performance for JPEG vs. wavelet image compression of x-ray coronary angiograms, Optics Express, 5, 8-19, (1999)

Eckstein, M.P., Whiting, J.S., Why do anatomic backgrounds reduce lesion detectability? Investigative Radiology, 33, 203-208 (1998)

Eckstein, M.P, Ahumada, A.J, Watson, A.B., Visual signal detection in structured backgrounds. II. Effect of contrast gain control, background variations and white noise, J. of the Opt. Soc. of Am A. (Special issue on visual contrast sensitivity), 14, 2406-2419, (1997)

Eckstein, M.P., Whiting, J.S. Thomas, J.P., Role of knowledge in human visual temporal integration in spatiotemporal noise, J. Optical Society of America A, 13, 1960-1968, (1996)

Eckstein, M. P., Whiting J.S., Visual Signal Detection in structured backgrounds I: Effect of number of possible spatial locations and signal contrast, Journal of the Optical Society of America A, 13, 1777-1787, (1996)

Eckstein, M.P., Whiting, J.S., Lesion detection in structured noise, Academic Radiology, 3, 249-253 (1995)

Eigler, N, Eckstein, M.P., Honig, D., Whiting, J.S., Improving detection of coronary morphologic features from digital angiograms: Effect of stenosis stabilized display, Circulation Vol. 89, 6, p 2700-2709, (1994)

Conference Proceedings:

Abbey, C. K., Sengupta, S., Zhou, W., Badal, A., Zeng, R., Samuelson, F. W., ... & Brankov, J. G. Analyzing neural networks applied to an anatomical simulation of the breast. In Medical Imaging: Image Perception, Observer Performance, and Technology Assessment (Vol. 12035, pp. 16-25). SPIE (2022)

Zhou, W., & Eckstein, M. P. A deep Q-learning method for optimizing visual search strategies in backgrounds of dynamic noise. In Medical Imaging: Image Perception, Observer Performance, and Technology Assessment (Vol. 12035, pp. 60-67). SPIE (2022)

Murlidaran, S., Wang, W. Y., & Eckstein, M. P. Comparing Visual Reasoning in Humans and AI. arXiv preprint arX, Workshop: How can findings about the brain improve AI systems? International Conference in Learning Representations (ICLR) (2021)

Han, N. X., Wang, W. Y., & Eckstein, M. P. Gaze Perception in Humans and CNN-Based Model. arXiv preprint arXiv:2104.08447, Workshop: How can findings about the brain improve AI systems? International Conference in Learning Representations (ICLR) (2021).

Klein, D. S., Lago, M. A., & Eckstein, M. P. The perceptual influence of 2D synthesized images on 3D search. In Medical Imaging 2021: Image Perception, Observer Performance, and Technology Assessment (Vol. 11599, p. 115990P). International Society for Optics and Photonics (2021)

Jonnalagadda, A., Lago, M. A., Barufaldi, B., Bakic, P. R., Abbey, C. K., Maidment, A. D., & Eckstein, M. P., Evaluation of convolutional neural networks for search in 1/f2. 8 filtered noise and digital breast tomosynthesis phantoms. In SPIE Medical Imaging 2020: Image Perception, Observer Performance, and Technology Assessment (Vol. 11316, p. 1131617). (2020)

Lago, M. A., Barufaldi, B., Bakic, P. R., Abbey, C. K., Maidment, A. D., & Eckstein, M. P., Foveated model observer to predict human search performance on virtual digital breast tomosynthesis phantoms. In SPIE Medical Imaging 2020: Image Perception, Observer Performance, and Technology Assessment (Vol. 11316, p. 113160V). (2020)

Abbey, C. K., Samuelson, F. W., Zeng, R., Boone, J. M., Eckstein, M. P., & Myers, K. J., Human observer templates for lesion discrimination tasks. In SPIE Medical Imaging 2020: Image Perception, Observer Performance, and Technology Assessment (Vol. 11316, p. 113160U), (2020)

Abbey, C.K, Samuelson, F.W., Zeng, R., Boone, J.M., Eckstein, M.P., Myers, K., Template models for forced-localization tasks, SPIE, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, 10952 (2019)

Lago, M. A., Abbey, C. K., & Eckstein, M. P. A foveated channelized Hotelling search model predicts dissociations in human performance in 2D and 3D images. In Medical Imaging 2019: Image Perception, Observer Performance, and Technology Assessment (Vol. 10952, p. 109520D). International Society for Optics and Photonics (2019)

Eckstein, M. P., Lago, M. A., & Abbey, C. K. Evaluation of search strategies for microcalcifications and masses in 3D images. In Medical Imaging 2018: Image Perception, Observer Performance, and Technology Assessment (Vol. 10577, p. 105770C). International Society for Optics and Photonics, (2018)

Lago, M. A., Abbey, C. K., Barufaldi, B., Bakic, P. R., Weinstein, S. P., Maidment, A. D., & Eckstein, M. P. Interactions of lesion detectability and size across single-slice DBT and 3D DBT. In Medical Imaging 2018: Image Perception, Observer Performance, and Technology Assessment (Vol. 10577, p. 105770X). International Society for Optics and Photonics, (2018).

Abbey, C. K., Lago, M. A., & Eckstein, M. P. Observer templates in 2D and 3D localization tasks. In Medical Imaging 2018: Image Perception, Observer Performance, and Technology Assessment (Vol. 10577, p. 105770T). International Society for Optics and Photonics, (2018)

Lago M., Abbey, C.K., Eckstein, M.P., Foveated Model Observers to predict human performance in 3D images, SPIE Medical Imaging, 101360P, (2017)

Eckstein, M. P., Lago, M. A., & Abbey, C. K. The role of extra-foveal processing in 3D imaging. In Medical Imaging 2017: Image Perception, Observer Performance, and Technology Assessment (Vol. 10136, p. 101360E). International Society for Optics and Photonics (2017)

Abbey, C.K., Samuelson, F.W., Wunderlich, A., Popescu, L.M., Eckstein, M.P., Boone, J.M. Approximate maximum likelihood estimation of scanning observer templates SPIE Medical Imaging, 94160O, (2015)

Ba A., Racine, D., Ott, J.G., Verdun, F.R., Kobbe-Schmidt, S., Eckstein, M.P., Bochud, F. Low contrast detectability in CT for human and model observer in multi-slice data sets, SPIE Medical Imaging, 94160F-8, (2015)

Koehler K., Eckstein, M.P., Scene Inversion Slows the Rejection of False Positives through Saccade Exploration During Search, Proceedings of the 37th Annual Meeting of the Cognitive Science Society. Pasadena, CA: Cognitive Science Society. (2015)

Akbas, E., Wadhwa, A., Eckstein, M.P., Madhow, U., A framework for machine vision based on neuro-mimetic front end processing and clustering, Communication, Control, and Computing (Allerton), 52nd Annual Allerton Conference, 311-318 (2014)

Cecotti, H., Eckstein, M. P., & Giesbrecht, B. Single-trial classification of neural responses evoked in rapid serial visual presentation: Effects of stimulus onset asynchrony and stimulus repetition. In Engineering in Medicine and Biology Society (EMBC), 1282-1285, (2014)

Abbey, C. K., Bakic, P. R., Pokrajac, D. D., Maidment, A. D., Eckstein, M. P., & Boone, J. M. Non-Gaussian statistical properties of virtual breast phantoms. In SPIE Medical Imaging (pp. 90370G-90370G). International Society for Optics and Photonics. (2014)

Cecotti, H., Eckstein, M. P., & Giesbrecht, B. Effects of performing two visual tasks on single-trial detection of event-related potentials. In Engineering in Medicine and Biology Society (EMBC), 2012 Annual International Conference of the IEEE (pp. 1723-1726). IEEE. (2012)

Cecotti H., Ries A.J., Eckstein M.P., Giesbrecht B., Multiclass classification of single trial evoked EEG responses, IEEE Engineering in Medicine and Biology Society, 1719-22, (2012)

Abbey, C. K., Eckstein, M. P. Modeling observer performance for optimizing medical image acquisition and processing. In IS&T/SPIE Electronic Imaging (pp. 82910S-82910S). International Society for Optics and Photonics (2012)

Diaz, I., Eckstein, M.P., Lyet, A., Bize, P., Bochud, F.O. , Measurements of the detectability of hepatic hypovascular metastases as a function of retinal eccentricity in CT images, Proc. SPIE 8318, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, (2012)

Cecotti, H., Kasper, R.W., Elliott, J.C., Eckstein, M.P., Giesbrecht, B., Multimodal target detection using single trial evoked EEG responses in single and dual-tasks, IEEE Engineering in Medicine and Biology Society, 6311-4, (2011)

Cecotti, H., Sato-Reinhold, J., Sy, J.L., Elliott, J.C., Eckstein, M.P., Giesbrecht, B., Impact of target probability on single-trial EEG target detection in a difficult rapid serial visual presentation task, IEEE Engineering in Medicine and Biology Society, 6381-4, (2011)

Abbey, C.K., Nosratieh, Zhang, S., Eckstein, M.P., and Boone, J.M., Characterizing non-Gaussian properties of breast images with a noisy-Laplacian distribution, Proc. SPIE Medical Imaging, Image Perception, Image Perception, Observer Performance, Technology Assessment, 7966, (2011)

Zhang S., Abbey C.K., Teymoorian A, Da X., Whiting J.S., Eckstein M.P., Model observers for complex discrimination tasks: assessments of multiple coronary stent placements, Proc. SPIE Medical Imaging, Image Perception, Observer Performance, Technology Assessment, 7627, (2010)

Abbey C.K., Eckstein M.P., High human-observer efficiency for forced-localization tasks in correlated noise, Proc. SPIE Medical Imaging, Image Perception, Observer Performance, Technology Assessment, 7627, (2010)

Das K., Zhang, S. B. Giesbrecht, M. P. Eckstein, Using Rapid Visually Evoked EEG Activity for Person Identification, in Proc. of the 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2490-3, (2009)

Sheng Zhang, Craig K. Abbey, Arian Teymoorian, Xiaolin Da, James S. Whiting, and Miguel P. Eckstein, Motion and display effects on perception of multiple coronary stents, Proc. SPIE Medical Imaging, Imaging, Vol. 7263, 726306, (2009)

Abbey C.K., Sohl-Dickstein J.N., Olshausen B.A., Eckstein M.P., and Boone J.M., Higher-order scene statistics of breast images, Proc. SPIE Medical Imaging, Vol. 7263, (2009)

Castella C., Ruschin M., Eckstein M.P., Abbey C.K., Kinkel K., Verdun, F.R., Tingberg A., Bochud F.O., Mass detection in breast tomosynthesis and digital mammography: a model observer study, Proc. SPIE Medical Imaging, Vol. 7263, (2009)

Abbey, C.K., Teymoorian, A., Schoonveld W., Da. X., Sheng, Z., Whiting J.S., Eckstein M.P., Perceptual assessment of multiple stent deployment, Proc. SPIE Medical Imaging, 6917, 17, (2008)

Castella C., Kinkel, K., Eckstein, M.P., Abbey, C.K., Verdun, F.R., Saunders, R.S., Samei, E. and Bochud, F., O.Mass detection on mammograms: signal variations and performance changes for human and model observers, SPIE Proc. Vol., 6917: Medical Imaging, (2008)
Castella C., Kinkel K., Verdun FR, Eckstein MP, Abbey CK, and Bochud, Mass detection on real and synthetic mammograms: human observer templates and local statistics, Proc. SPIE Medical Imaging, Observers Performance and Technology Assessment ,Vol. 6515, (2007)

Abbey, C.K., Insana, M.F., Eckstein, M.P. and Boone, J.M., A bivariate binormal ROC methodology for comparing new methods to an existing standard for screening applications, Proc. SPIE Medical Imaging, Image Perception, Observers Performance and Technology Assessment, Vol. 6515, (2007)

Castella, C, Kinkel, K, Dsecombes F, Eckstein, M.P., Sottas, P.E., Verdun, F.R., Bochud, F.O., Mammographic texture synthesis using genetic programming and clustered lumpy background, Proc. SPIE, Medical Imaging, Image Perception, Observer Performance, and Technology Assessment, 6146, (2006)

Zhang, Y., Abbey, C.K., Eckstein, M.P., Observer performance detecting signals in globally non-stationary oriented noise, Proc. SPIE, Medical Imaging, Image Perception, Observer Performance, and Technology Assessment, 6146, (2006)

Eckstein, M.P., Pham, B.T., Abbey, C.K., Zhang Y, The efficiency of reading around learned backgrounds, Proc. SPIE, Medical Imaging, Image Perception, Observer Performance, and Technology Assessment, 6146, (2006)

Zhang, Y., Pham BT, Eckstein MP, Evaluation of internal noise methods for Hotelling observers, Proc. SPIE, Medical Imaging, Image Perception, Observer Performance, and Technology Assessment,5749, 162 (2005)

Eckstein, M.P., Zhang, Y., Pham, B.T., Metrics of medical image quality: task-based model observers vs. image discrimination/perceptual difference models, Proc SPIE Vol. 5272, 42-52, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, (2004)

Zhang, Y., Eckstein M.P., Pham, B.T., The effect of non-linear human visual system components on linear model observers, Proc SPIE Vol. 5272, 31-41, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, (2004)

Eckstein, M.P., Zhang Y., Abbey C.K, Optimization of model observer performance for signal known exactly but variable tasks leads to optimized performance in signal known statistically tasks, Proc. SPIE Vol. 5034, p. 371-382, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, (2003)

Zhang, Y., Pham B., Eckstein, M.P., JPEG 2000 encoder options on model observer performance in signal known exactly but variable tasks (SKEV)", Proc. SPIE Vol. 5034, p. 371-382, Medical Imaging: Image Perception, Observer Performance, and Technology Assessment, (2003)

Eckstein, M.P., Abbey, C.K., B. Pham, Effect of image compression for model and human observers in signal known statistically tasks, Proc. SPIE, Image Perception, 4686, 13-24, (2002)

Abbey, C.K., Eckstein, M.P., Shimozaki, S.S., Baydush, A.H., Catarious, C.E., Floyd, C.E., Human observer templates for detection of a simulated lesion in mammographic images, Proc. SPIE, Image Perception, 4686, 25-36, (2002)

Abbey, C.K., Eckstein, M.P., Theory for estimating human-observer templates in two-alternative forced-choice experiment. Proc. 17th Int. Conf. On Information Processing in Medical Imaging (M.F. Insana and R. Leahy, Eds.), Springer-Verlag, Berlin, (2001).

Eckstein, M.P., Abbey, C.K., Model observers for signal-known-statistically tasks, Proc. SPIE, Image Perception and Performance, 4324, 91-103, (2001)

Abbey, C.K., Eckstein, M.P., Maximum likelihood and maximum a posteriori estimates of human observer templates, Proc. SPIE, Image Perception and Performance, 4324, 114-123, (2001)

Eckstein, M.P., Abbey C.K., Bartroff, J.L., Model observer based optimization of JPEG image compression, Proc. SPIE, Image Perception and Performance, 3981, 106-115, (2000)

Abbey, C.K., Eckstein, M.P., Estimates of human-observer templates for a simple detection task in correlated noise, Proc. SPIE, Image Perception and Performance, 3981, 70-77, (2000)

Abbey, C.A., Eckstein, M.P., Bochud, F.O., Estimation of human templates for 2 alternative forced choice tasks, Proc. SPIE, Image Perception,.3363, 284-295, (1999)

Bochud F. O., Abbey C.K., Eckstein M.P., Further investigation of the effect of phase spectrum on visual detection in structured backgrounds, Proc. SPIE Image Perception, 3663, 273-283, (1999)

Eckstein M.P., Abbey C.K., Whiting, J.S., The effect of image compression in model and human observers, Proc. SPIE Image Perception, 3363, 242-252, (1999)

Bartroff, J., Morioka, C.A., Whiting, J.S., Eckstein, M.P., Image compression and feature stabilization of dynamically displayed coronary angiograms, Medical Imaging, Image Perception, Proc. SPIE Image Perception, 3363, 342-346, (1999)

Carney, T., Klein, S. A., Tyler, C. W., Silverstein, A. D., Beutter, B., Levi, D., Watson, A. B., Reeves, A. J., Norcia, A. M., Chen, C.-C., Makous, W., & Eckstein, M. P. The development of an image/threshold database for designing and testing human vision models. In B. Rogowitz & T. Pappas (Eds.), Proceedings of the SPIE (Vol. 3644, pp. 542-551). Bellingham, WA: SPIE. (1999)

Eckstein, M. P., Abbey, C.A, Whiting, J.S., Human vs model observers in anatomic backgrounds Proceedings SPIE Image Perception, 3340, 15-26, (1998)

Barrett, H.H., Abbey, C.A., Eckstein M.P., Stabilized estimates of Hotelling observer detection performance in patient-structured noise, Proceedings SPIE Image Perception, 3340, 27-43, (1998)

Eckstein, M.P., Wickens, T.D., Aharonov G., Ruan G., Morioka C.A., Whiting, J.S., Quantifying the limitations of the use of consensus expert committees in ROC studies, Proceedings SPIE Image Perception, 3340, 128-134, (1998)

Eckstein, M.P., Ahumada. A.J., Watson, A.B., Image discrimination models predict visual detection in natural image backgrounds, Proceedings to SPIE Electronic Imaging, Human Vision & Applications,3016, 44-56 (1997)

Eckstein, M.P, Ahumada, A.J, Watson, A.B., Whiting, J.S., What is degrading human performance in natural medical image backgrounds?, Medical Imaging, Image Perception,. Proceedings SPIE, 3036, 50-63 (1997)

Abbey, C.K., Barrett, H.H,., Eckstein, M.P., Practical issues and methodology for using model observers as metrics of image quality, in Medical Imaging: The Physics of Medical Imaging, R.L. Van Metter and J. Beuttel, eds., Proc. SPIE 3032, 182-194, (1997)

Eckstein M. P., Whiting J.S., Thomas J.P., Detection and discrimination of moving signals in Gaussian uncorrelated noise, in Medical Imaging, Image Perception, Harold L. Kundel, Editor, Proc. SPIE 2712, 9-25, (1996)

Whiting J.S., Eckstein, M. P., Morioka, C.A., Eigler, N., Effect of additive noise, signal contrast and feature motion on signal detection in structured noise, in Medical Imaging, Image Perception, Harold L. Kundel, Editor, Proc. SPIE 2712, 39-47, (1996)

Morioka, C. A., Whiting J.S., Eckstein, M. P., Shaw, K., Multiframe quantitative coronary arteriography, in Medical Imaging, Proc SPIE, 2710, 94-102, (1996)

Eckstein, M.P., Morioka, C.A., Whiting, J.S., Eigler, N., Psychophysical evaluation of the effect of JPEG, Full-frame DCT and Wavelet image compression on signal detection in medical image noise, in Medical Imaging, Image Perception, Harold Kundel, Editor, Proc. SPIE 2436, 79-89 (1995)

Technical Reports:

Quantitative metrics relating perceptual and oculomotor performance during search, M.P. Eckstein, B.R. Beutter, L.S. Stone, NASA Technical Memorandum, (1998)

Analytic Representation of Guided Search model for accuracy in localization tasks, M.P. Eckstein, B.R. Beutter, NASA Technical Memorandum, Technical Memorandum, (2000)

PUBLISHED ABSTRACTS AND PRESENTATIONS:

Vision Science Society Annual Meeting
Optical Society of America Annual Meeting
European Conference on Visual Perception Annual Meeting
Society for Neuroscience Annual Meeting
Computational System Neuroscience Annual Meting
Medical Image Perception Conference Meeting
Association for Research in Visual Ophthalmology Meeting
Society for Cognitive Neuroscience Meeting

SELECTED INVITED TALKS:

Conference/Workshop/Symposia invited talks:

NeurIPS Workshop, Eye Movement Models and Medical Images, (2022)
Plenary Lecture, Workshop on Prediction and Categorization, Giessen, Germany (2022)
SPIE Medical Imaging, Eye Movements Workshop (2022)
Keynote Speaker, Third Latin American Workshop on Vision Sciences (2021)
NeurIPS Workshop: Shared Visual Representations in Human/Machine Intelligence, (2020)
Mind and Machine Intelligence Workshop UC Santa Barbara (2020)
NIH Think Tank on Cognition and Perception in Medical Imaging, (2019)
European Conference on Visual Perception Symposium on Eye Movements (2018)
Gordon Research Conference on Eye Movements (2017)
University of British Columbia, Current Directions in Vision Science (2017)
Workshop on Attention, Value and Rewards, University of Marburg (2016)
Computational System Neuroscience, COSYNE, Workshop (2016)
International Workshop on Perceptual Learning, Calafate Argentina (2016)
International Workshop on Perceptual Learning, Switzerland (2014)
Keynote Speaker, Spatial Search Meeting, Santa Barbara, (2014)
Summer Institute on Cognitive Neuroscience (2014)
Workshop on Visual Search, National Cancer Institute (2014)
Workshop on Natural Environment Tasks and Intelligence, UT Austin (2014)
Keynote Speaker, SPIE Medical Imaging, Image Perception Conference (2013)

Symposium in Perceptual Learning, Asia Pacific Conference in Vision (2013)
International workshop on Perceptual Learning, (Nara, Japan, 2012)
Keynote Speaker, Eye movements and Applications Meeting (USA, 2012)
International Workshop on Visual Attention (Allahabad, India, 2011)
International Workshop on Perceptual Learning (Eliat, Israel, 2010)
1st Brazilian Meeting in Brain and Cognition, (Sao Paulo, 2010)
Annual Meeting for Brazilian Society for Neuroscience (Caxambu, 2010)
Vision Science Society Symposium, Attention and Reward (2010)
Dinner Banquet Lecture, SPIE Human Vision & Electronic Imaging (2010)
Summer Institute on Cognitive Neuroscience, (2009)
National Geospatial Agency Workshop on Visual Search, Virginia, (2009)
Workshop on Model observers for breast tomosynthesis and computed tomography, University of Chicago, (2009)
Workshop on eye movements and perception, Computational Systems Neuroscience Meeting, Utah (2009)
Workshop on Perceptual Learning, Beijing, China (2008)
Workshop on Natural Environment Tasks and Intelligence, UT Austin (2008)
Vision Science Society, Symposium on classification images, Florida (2007)
American Association of Physicists in Medicine, Annual Meeting (2005)
Joint Symposium on Neural Computation, UCLA (2005)
American Psychological Society, Annual Meeting, Visual Attention Symposium (2005)
International workshop on Visual Attention, Italy (2003)
Munich Visual Search Symposium (2003)
Mathematical Psychology Meeting: Multidimensional Signal Detection symposium (2002)
Optical Society of America Meeting, Eye movements during search symposium, (1999)

Selected university invited talks:

Department of Psychology, University of Humboldt, Berlin (2022)
Neuroscience and Behavior Seminar, UMass, Amherst (2021)
Army Research Lab, Fellows and Regional Site Leads Colloquium (2020)
Institute of Neuroscience, CNRS, Marseille, France (2020)
Department of Experimental and Applied Psychology, Vrije Univ., Netherlands (2020)
Institute of Optics, Consejo Superior de Estudios Cientificos, Spain (2019)
Department of Neuroscience, Baylor College of Medicine, (2019)
MindCore Lecture, University of Pennsylvania (2018)
Boynton Colloquium, Center for Vision Sciences, University of Rochester (2017)
Department of Psychological Sciences, Vanderbilt Univ. (2015)
Ground Breaking Research and Innovative Technology Lecture, Santa Barbara (2014)
Department of Psychology, Georgia Tech, (2013)
Department of Psychology, Beijing University, (2013)
Brain and Cognitive Sciences, MIT (2012)
Computational Neuroscience Group, UCLA (2011)
Two-week workshop: Department of Physics, University of Buenos Aires (2011)
Kavli Institute for Theoretical Physics, UC Santa Barbara (2010)
Institute for Applied Radiophysics, Lausanne Switzerland, (2009)
Ecole Polytechnique Fédérale de Lausanne Switzerland, (2009)
Vision Science Program, UC Berkeley (2008)
Electrical Engineering and Computer Science, UC Merced, (2008)
New York Vision Seminar Series (NYU, Columbia, Cornell Medical, SUNY, 2008)

Neurobiology Institute, Freie University, Germany (2007)
Bernstein Center for Computational Neuroscience, Germany (2007)
Dept. of Psychology, University of Birmingham, UK (2007)
Dept. of Psychology, University of Bristol, UK (2007)
Institute for Light and Vision, University of Tucuman, Argentina (2007)
Center for Visual Sciences, University of Rochester (2006)
Max Planck Institute, Tubingen, Germany (2005)
Department of Radiology, University of Chicago (2005)
Siemens Research Center, Princeton, New Jersey, (2004)
Department of Psychology, University of Pennsylvania (2004)
Department of Psychology, UCLA (2004)
Quantitative Methods in Social Sciences, UC Santa Barbara (2003)
Interactive Digital Multimedia Seminar Series, UC Santa Barbara (2003)
Department of Psychology, University of Texas, Austin (2002)
The Sloan-Swartz Center for Theoretical Neurobiology at the Salk Institute (2002)
Smith Kettlewell Eye Research Institute (2002)
Department of Engineering, UC Santa Barbara (2002)
Dept. of Cognitive Science, University of California Irvine (2001)
NASA Ames Research Center (2001)
Dept. of Psychology, New York University (2000)
Dept. of Psychology, University of Illinois, Urbana (1999)
Dept. of Psychology, University of Toronto (1999)
Center for Visual Sciences, Univ. of Rochester (1999)
Dept. of Psychology, UC Santa Barbara, (1998)
Pavlov Institute of Physiology, Russian Academy of Sciences, (1997)
Swedish Center for Optical Research, Stockholm (1997)
NASA Ames Research Center (1996)
Dept. of Psychology, Harvard University (1995)
Optical Sciences Center, University of Arizona, (1995)