Emily Cooper

CONTACT

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APPOINTMENTS

Dartmouth College **2015 – present**
Assistant Research Professor, Psychological and Brain Sciences *2015 – present*
Adjunct Assistant Professor, Computer Science *2016 – present*

Stanford University **2013 – 2015**
Postdoctoral Research Scholar, Psychology
(Advisor: Anthony Norcia)

EDUCATION

University of California, Berkeley **2007 – 2012**
Ph.D., Neuroscience
Dissertation: Perception of Depth in Real and Pictured Environments
(Advisor: Martin Banks)

University of Chicago **2003 – 2007**
B.A., Psychology and English Language & Literature (Phi Beta Kappa)

RESEARCH FUNDING

Neukom Institute, Biologically-plausible model of associative learning (co-PI)	2017
Intel Light Field Display ISRA Program, Unrestricted Gift (co-I)	2017
Oculus, Unrestricted Gift (PI)	2017
Samsung GRO, Monovision and Focus-tunable Near-eye Displays (co-I)	2016
Microsoft, Augmenting Reality for the Visually Impaired (PI)	2015
National Science Foundation, Graduate Research Fellowship	2011
Dept of Defense, National Defense Science & Engineering Graduate Fellowship	2009

AWARDS

NVIDIA, Academic GPU Award	2016
Stanford University, Henzl-Gabor Young Women in Science Travel Award	2013
ARVO, Vision Sciences Society Student Travel Award	2012
UC Berkeley, Outstanding Graduate Student Teaching Award	2009
HHMI, Undergraduate Research Fellowship	2006

ARTICLES

M. Kinateder, J. Gualtieri, M.J. Dunn, W. Jarosz, X. Yang and E.A. Cooper. Using an Augmented Reality Device as a Distance-Based Vision Aid – Promise and Limitations. *Optometry & Vision Science*, in press

B. Rokers, J.M. Fulvio, J. Pillow, and E.A. Cooper. Systematic Misperceptions of 3D Motion Explained by Bayesian Inference. *Journal of Vision*, in press

R. Konrad, N. Padmanaban, K. Molner, E.A. Cooper, and G. Wetzstein. Accommodation-invariant Computational Near-eye Displays. *ACM Transactions on Graphics (SIGGRAPH Conference Proceedings)*, 36(4):88, 2017

N. Padmanaban, R. Konrad, T. Stramer, E.A. Cooper, and G. Wetzstein. Optimizing Virtual Reality for All Users Through Gaze Contingent and Adaptive Focus Displays. *Proceedings of the National Academy of Sciences*, 114(9), 2183-2188, 2017

E.A. Cooper, M. van Ginkel, and B. Rokers. Sensitivity and Bias in the Discrimination of 2D and 3D Motion Direction. *Journal of Vision*, 16(10):5, 2016

W.W. Sprague, E.A. Cooper, S. Reissier, B. Yellapragada, and M.S. Banks. The Natural Statistics of Blur. *Journal of Vision*, 16(10):23, 2016

E.A. Cooper and A.P. Mackey. Sensory and Cognitive Plasticity: Implications for Academic Interventions. *Current Opinion in Behavioral Sciences*, 10, 21-27, 2016

E.A. Cooper. A Normalized Contrast-encoding Model Exhibits Bright/dark Asymmetries Similar to Early Visual Neurons. *Physiological Reports*, 4(7), e12746, 2016

R. Konrad, E.A. Cooper, and G. Wetzstein. Novel Optical Configurations for Virtual Reality: Evaluating User Preference and Performance with Focus-tunable and Monovision Near-eye Displays. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, 2016

E.A. Cooper and A. Radonjic. Gender Representation in the Vision Sciences: a Longitudinal Study. *Journal of Vision*, 16(1):17, 2016

E.A. Cooper and H. Farid. Does the Sun Revolve Around the Earth? A Comparison between the General Public and On-line Survey Respondents in Basic Scientific Knowledge. *Public Understanding of Science*, 25(2): 146-153, 2016

W.W. Sprague*, E.A. Cooper*, I. Tosic and M.S. Banks. Stereopsis is Adaptive for the Natural Environment. *Science Advances*, 1(4), e1400254, 2015 *Author order determined by coin toss

E.A. Cooper and A.M. Norcia. Predicting Cortical Dark/Bright Asymmetries from Natural Image Statistics and Early Visual Transforms. *PLOS Computational Biology*, 11(5), e1004268, 2015

D.E. Jacobs, O. Gallo, E.A. Cooper, K. Pulli, and M. Levoy. Simulating the Visual Experience of Very Bright and Very Dark Scenes. *ACM Transactions on Graphics*, 34(3): 25, 2015

E.A. Cooper and A.M. Norcia. Perceived Depth in Natural Images Reflects Encoding of Low-level Luminance Statistics. *Journal of Neuroscience*, 34(35), 11761-8, 2014

M.S. Banks, E.A. Cooper, and E.A. Piazza. Camera Focal Length and the Perception of Pictures. *Ecological Psychology*, 26(1-2), 30-46, 2014

E.A. Cooper, H. Jiang, V. Vildavski, J.E. Farrell, and A.M. Norcia. Assessment of OLED Displays for Vision Research. *Journal of Vision*, 13(12):16, 1-13, 2013

P. Vangorp, C. Richardt, E.A. Cooper, G. Chaurasia, M.S. Banks, and G. Drettakis. Perception of Perspective Distortions in Image-Based Rendering. *ACM Transactions on Graphics (SIGGRAPH Conference Proceedings)*, 32(4), 58:1-12, 2013

E.A. Cooper, E.A. Piazza, and M.S. Banks. The Perceptual Basis of Common Photographic Practice. *Journal of Vision*, 12(5):8, 1-14, 2012

R.T. Held, E.A. Cooper, and M.S. Banks. Blur and Disparity are Complementary Cues to Depth. *Current Biology*, 22(5), 2012

E.A. Cooper, J. Burge, and M.S. Banks. The Vertical Horopter is not Adaptable, but It may be Adaptive. *Journal of Vision*, 11(3):20, 1-19, 2011

E.A. Cooper, U. Hasson, and S.L. Small. Interpretation-Mediated Changes in Neural Activity During Language Comprehension. *NeuroImage*, 55(3): 1314-23, 2011

R.T. Held, E.A. Cooper, J. O'Brien, and M.S. Banks. Using Blur to Affect Perceived Distance and Size. *ACM Transactions on Graphics*, 29(2): 1-16, 2010

Abstracts

M. Kinateder, T. Pfaff, and E.A. Cooper. The Visual Features of Smoke. *Journal of Vision*, 2017

S. Finocchetti, E.A. Cooper, and M. Gori. Visual Experience and Spatial Reference Frames for Sound Localization. *International Multisensory Research Forum*, 2017

N. Padmanban, R. Konrad, E.A. Cooper, and G. Wetzstein. Optimizing Virtual Reality for All Users Through Adaptive Focus Displays. *SIGGRAPH*, 2017

R. Konrad, N. Padmanaban, E.A. Cooper, and G. Wetzstein. Computational Focus-Tunable Near-Eye Displays. *SIGGRAPH Emerging Technologies*, 3, 2016

M.S. Banks, W.W. Sprague, E.A. Cooper, and S. Reissier. How Natural Distributions of Blur Affect 3D Percepts. *Journal of Vision*, 16(12); 195, 2016

E.A. Cooper and A.M. Norcia. What are the Natural Scene Statistics of Cortical Input? *Journal of Vision*, 15(12); 1287, 2015

W.W. Sprague, E.A. Cooper and M.S Banks. Statistics of Retinal Image Blur During Natural Viewing. *Journal of Vision*, 15(12): 766, 2015

E.A. Cooper and A.M. Norcia. Perceived Depth in Natural Images Reflects Encoding of Low-Level Luminance Statistics. *Journal of Vision*, 14(10): 1112, 2014

W.W. Sprague, E.A. Cooper, J.-B. Durand, and M.S. Banks. Disparity Preferences in V1 Reflect the Statistics of Disparity in Natural Viewing. *Journal of Vision*, 14(10): 1111, 2014

A.M. Norcia, J.M. Ales, E.A. Cooper, and T. Weigand. Measuring Perceptual Differences between Compressed and Uncompressed Video Sequences using the Swept-Parameter Visual Evoked Potential. *Journal of Vision*, 14(10): 649, 2014

J. Yang, M. Andric, S. Duncan, A. Holt, U. Hasson, E.A. Cooper, and S.L. Small. Top-Down Modulation of Brain Networks During Discourse Comprehension. *Society for the Neurobiology of Language*, San Diego, CA, 2013

E.A. Cooper, W.W. Sprague, I. Tosic, and M.S. Banks. Is Stereopsis Optimized for the Natural Environment? *Journal of Vision*, 13(9): 612, 2013

J. Yang, U. Hasson, E.A. Cooper, and S.L. Small. Influence of Selective Attention on Story Comprehension. *Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA, 2013

E.A. Cooper and M.S. Banks. Perception of Depth in Pictures when Viewing from the Wrong Distance. *Journal of Vision*, 12(9): 896, 2012

E.A. Cooper, E.A. Piazza, and M.S. Banks. Depth Compression and Expansion in Photographs. *Journal of Vision*, 11(11): 65, 2011

E.A. Cooper, J. Burge, and M.S. Banks. Do People of Different Heights Have Different Horopters? *Journal of Vision*, 10(7): 372, 2010

R.T. Held, E.A. Cooper, and M.S. Banks. Blur and Disparity Provide Complementary Distance Information for Human Vision. *Journal of Vision*, 10(7): 57, 2010

R.T. Held, E.A. Cooper, J. O'Brien, and M.S. Banks. Making Big Things Look Small: Blur Combined With Other Depth Cues Affects Perceived Size and Distance. *Journal of Vision*, 9(8): 959, 2009

E.A. Cooper, U. Hasson, and S.L. Small. Dimensions of Discourse: Brain Activation During the Processing of Temporal, Spatial, and Actional Information in Narrative. *Cognitive Neuroscience Society Annual Meeting*, New York, NY, 2007

Invited Talks

Using AR/VR to Better Understand Individual Differences in Vision and Visually-guided Behavior	Oculus, 2018
The Potential for Improving Impaired Vision with Augmented Reality	OSA Frontiers in Optics, 2017
What 3D Scene Statistics Tell Us About 3D Vision,	Harvard Medical School, 2017
Designing and Assessing VR/AR Displays to Increase User Inclusivity,	VSS Symposia, 2017
What More can Natural Images Tell Us About ON and OFF Pathways?	Cosyne Workshop, 2017
Designing and Assessing VR/AR Displays to Increase User Inclusivity,	Google, 2017
Designing and Assessing VR/AR Displays to Increase User Inclusivity,	Stanford SCIEN , 2017
What 3D Scene Statistics Tell Us About 3D Vision,	University of Pennsylvania, 2016
What 3D Scene Statistics Tell Us About 3D Vision,	Rochester Institute of Technology, 2016
What 3D Scene Statistics Tell Us About 3D Vision,	UW Madison, 2016
What 3D Scene Statistics Tell Us About 3D Vision,	UT Austin NETI Workshop, 2016
The Computational Demands of Biological Stereovision,	Massachusetts Institute of Technology, 2015
The Visual Representation of Brights and Darks,	Italian Institute of Technology, 2015
The Computational Demands of Biological Stereovision,	Middlebury College, 2015
Creating Illusions of Depth,	Google, 2014
Is Stereopsis Optimized for Our Natural Environment?	Bay Area Vision Research Day, 2013
Is 3D Vision Optimized for Our Natural Environment?	Dartmouth Cognitive Brown Bag, 2013
Is Stereopsis Optimized for Our Natural Environment?	Bay Area Society for Information Display, 2012
The Perceptual Basis of Common Photographic Techniques,	Stanford University, 2012

Teaching

Dartmouth College, Technology, Psychology & Neuroscience	2017
Dartmouth College, Functional Neuroanatomy	2016
UC Berkeley, Graduate Student Instructor, Brain, Mind & Behavior	2010
UC Berkeley, Graduate Student Instructor, Mammalian Neuroanatomy	2008

Lab Members

Max Kinateder, Postdoctoral Fellow
Zeynep Başgöze, Postdoctoral Fellow
Justin Gualtieri ('18), Senior Thesis Student
Klara Barbarossa ('20), Research Assistant
Alaa Mustafa ('20), Research Assistant

Lab Alumni

Andrew Kim ('16), Research Assistant
Jonathan Huang ('17), Senior Thesis Student
Tim Tadros ('17), Senior Thesis Student
Irene Feng ('17), Senior Thesis Student

Other Activities

Mind & Brain Night, After School Activity Nights	2008 – 2012
Community Resources for Science, Middle School Classroom Lessons	2008 – 2012
Helen Wills Neuroscience Institute, Speaker Series Committee	2008 – 2010
Helen Wills Neuroscience Institute, Graduate Admissions Committee	2010