Emily Cooper emilycooper@berkeley.edu | www.emilyacooper.org

Positions

University of California, Berkeley **2018 – present**
Assistant Professor, School of Optometry
Vision Science Program and Helen Wills Neuroscience Institute

Dartmouth College **2015 – 2018**
Assistant Research Professor, Psychological and Brain Sciences *2015 – 2018*
Adjunct Assistant Professor, Computer Science *2016 – 2018*

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)

Fellowships

National Science Foundation, 2011
Graduate Research Fellowship

Department of Defense, 2009
National Defense Science & Engineering Graduate Fellowship

Howard Hughes Medical Institute, 2006
Undergraduate Research Fellowship

Research Funding

Google, 2019
Characterizing the perceptual eyebox (PI)

Human Frontier Science Program, 2018
Visual circuit adaptations to natural environments & behaviors in zebrafish and cichlids (co-I)

Facebook Reality Labs, 2018
Unrestricted Gift

Neukom Institute, Dartmouth College [Internal], 2017
Biologically-plausible model of associative learning (co-PI)

Intel, 2017
Light Field Display ISRA Program, Unrestricted Gift

Oculus, 2017
Unrestricted Gift

Samsung, 2016
Global Research Outreach, Monovision and focus-tunable near-eye displays (co-I)

Microsoft, 2015
Augmenting reality for the visually impaired, Unrestricted Gift

Awards

NEI, Early Career Scientist Travel Grant, 2019

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

Articles

T. Tadros, N.C. Cullen, M.R. Greene and E.A. Cooper. Assessing Neural Network Scene Classification from Degraded Images. *ACM Transactions on Applied Perception*, in press

J. Huang, M. Kinateder, M.J. Dunn, W. Jarosz, X. Yang and E.A. Cooper. An Augmented Reality Sign-reading Assistant for Users with Reduced Vision. *PLOS One*, 14(1): e0210630, 2019

Z. Başgöze, A.P. Mackey and E.A. Cooper. Plasticity and Adaptation in Adult Binocular Vision. [Review Article] *Current Biology*, 28(24), R1406-R1413, 2018

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*, 95(9), 727-737, 2018

B. Rokers, J.M. Fulvio, J. Pillow, and E.A. Cooper. Systematic Misperceptions of 3D Motion Explained by Bayesian Inference. *Journal of Vision*, 18(3):23, 2018

E.A. Cooper and M.S. Banks. Perceived Facial Distortions in Selfies are Explained by Viewing Habits. [Commentary] *JAMA Facial Plastic Surgery*, 20(5), 431, 2018

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. [Review Article] *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, 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, 2013

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

R.T. Held, E.A. Cooper, and M.S. Banks. Blur and Disparity are Complementary Cues to Depth. *Current Biology*, 22(5), 426-31, 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, 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):19, 2010

Abstracts

Z. Başgöze, D. White, J. Burge and E.A. Cooper. Effects of Context on the Visual Stability of Depth Edges in Natural Scenes. *Journal of Vision*, 2019

X. Huang, C. Wang, B. Arseneau, T.E. Yerxa, E.A. Cooper. Natural scene statistics of depth and motion pertinent to figure-ground segregation. *Society for Neuroscience*, 2019

A. Boroshok, G. Velasquez, A. Park, K. Simon, J. Forde, E.A. Cooper, A.P. Mackey. Individual Differences in Human Frontoparietal Plasticity. *Flux Congress*, 2019

M. Kinateder and E.A. Cooper. Using Visual Snapshots to Estimate Egocentric Orientation in Natural Environments. *Journal of Vision*, 18:513, 2018

M. Kinateder, T. Pfaff, and E.A. Cooper. The Visual Features of Smoke. *Journal of Vision*, 17(10):415, 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

3D Vision
Cold Spring Harbor Laboratory: Vision: A Platform for Linking Circuits, Behavior & Perception, 2019

Considering Individual Differences in Vision for AR/VR
Magic Leap, 2019

3D Vision in Natural Environments
UC Berkeley Institute of Cognitive and Brain Sciences, 2019

3D Vision in Natural Environments
SUNY Optometry, 2019

3D Vision in Natural Environments
Bay Area Vision Research Day, 2018

Maximizing Insights Gained About Vision Across Animal Models, Computational Models, and Humans
Computational Cognitive Neuroscience, 2018

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 College, 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

UC Berkeley, VS 260D Seeing in Time, Space, and Color (guest lecturer)	Spring 2018
Dartmouth College, Functional Neuroanatomy	Spring 2018
Dartmouth College, Technology, Psychology & Neuroscience	Spring 2017
Dartmouth College, Functional Neuroanatomy	Spring 2016
UC Berkeley, Graduate Student Instructor, MCB 61 Brain, Mind & Behavior	Spring 2010
UC Berkeley, Graduate Student Instructor, MCB 163 Mammalian Neuroanatomy	Fall 2008

Former Advisees

Jonathan Huang (2017), Undergraduate Senior Thesis Student (Computer Science)
Tim Tadros (2017), Undergraduate Senior Thesis Student (Computer Science)
Irene Feng (2017), Undergraduate Senior Thesis Student (Computer Science)
Max Kinateder (2018), Postdoctoral Researcher
Thomas Yerxa (2019), Undergraduate Senior Thesis Student (Physics)

Other Activities

Center for Innovation in Vision and Optics, Faculty Member	2018 –
Institute of Cognitive & Brain Sciences, Faculty Member	2018 –
Females of Vision et al., Advisory Board	2018 –
Helen Wills Neuroscience Institute, Graduate Admissions Committee	2010 – 2010
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