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

Positions

University of California, Berkeley **2018 – present**
Assistant Professor, School of Optometry
Vision Science Program
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

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, *Graduate Research Fellowship* 2011
Department of Defense, *National Defense Science & Engineering Graduate Fellowship* 2009
Howard Hughes Medical Institute, *Undergraduate Research Fellowship* 2006

Research Funding

Facebook Reality Labs, *Adaptation to minification caused by spectacles* (PI) 2020
National Institute of Health, *Neural codes underlying visual segmentation* (co-I, PI Huang) 2020
CITRIS Core Seed Funding, *Enhancing obstacle visibility using a head-mounted vision aid* (co-PI) 2020
Google, *Characterizing the perceptual eyebox* (PI) 2019
Human Frontier Science Program, *Visual circuit adaptations in zebrafish & cichlids* (co-I) 2018
Facebook Reality Labs, *Unrestricted gift* 2018
Neukom Institute (Dartmouth College), *Biologically-plausible model of associative learning* (co-PI) 2017
Intel, *Light Field Display ISRA Program, Unrestricted gift* 2017
Oculus, *Unrestricted Gift* 2017
Samsung, *Global Research Outreach, Monovision and focus-tunable near-eye displays* (co-I, PI Wetzstein) 2016
Microsoft, *Augmenting reality for the visually impaired, Unrestricted gift* 2015

Awards

National Eye Institute, *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

M. Wang and E.A. Cooper. A Re-Examination of Dichoptic Tone Mapping *ACM Transactions on Graphics*, in press

S.A. Cholewiak, Z. Başgöze, O. Cakmakci, D.M. Hoffman and E.A. Cooper. A Perceptual Eyebox for Near-Eye Displays. *Optics Express*, 28(25), 38008-38028, 2020

T.E. Yerxa, E. Kee, M.R. DeWeese and E.A. Cooper. Efficient Sensory Coding of Multidimensional Stimuli. *PLOS Computational Biology*, 16(9):e1008146, 2020

Z. Başgöze, D.N. White, J. Burge and E.A. Cooper. Natural Image Statistics at Depth Edges Modulate Perceptual Stability *Journal of Vision*, 20(8):10, 2020

Z. Başgöze, J. Gualtieri, M.T. Sachs and E.A. Cooper. Navigational Aid Use by Individuals with Visual Impairments. [Conference Paper] *Journal on Technology & Persons with Disabilities*, 8: 22-39, 2020

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*, 16(4): 21, 2019

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

M. Wang and E.A. Cooper. A Re-examination of Dichoptic Tone Mapping Methods. *Journal of Vision*, 20:887, 2020

L.T. Cai, V. Krishna, T. Hladnik, N. Guilbeault, S. Juntti, T. Thiele, A. Arrenberg and E.A. Cooper. Visual Statistics of Aquatic Environments in the Natural Habitats of Zebrafish. *Journal of Vision*, 20:433, 2020

T. Thiele, S. Juntti, K. Wang, L. Cai, T. Hladnik, R. Meier, F. Dehmelt, J. Hinz, V. Subramanian, N. Guilbeault, E.A. Cooper and A. Arrenberg. Investigation of Visual Circuit Adaptations to Natural Environmental Motion in Zebrafish and Cichlids. *Zebrafish Neural Circuits and Behavior*, 2019

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*, 19:223a, 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

The Potential for Improving Impaired Vision with Augmented Reality, *UCB Learning in Retirement*	2020
Perceptual Science for Augmented Reality, *UC Berkeley Institute of Cognitive and Brain Sciences*	2020
Perceptual Science for Augmented Reality, *Northwestern University*	2020
Perceptual Science for Augmented Reality, *Smith Kettlewell*	2020
A Perceptual Eyebox for Augmented Reality, *SNAP*	2020
Natural and Virtual 3D Vision, *UNR Big Data Summer School*	2020
Understanding Visual Demands for Aquatic Animals used in Neuroscience Research, *Sussex Visions*	2020
A Perceptual Eyebox for Augmented Reality, *Google*	2019
A Perceptual Eyebox for Augmented Reality, *UC Berkeley Vive Center*	2019
3D Vision in Natural Environments, *UC Berkeley Neuroscience Bootcamp*	2019
3D Vision, *Cold Spring Harbor Laboratory: Vision Course*	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
Insights Across Animal Models, Computational Models, & Humans, *Computational Cognitive Neuroscience*	2018
Using AR/VR to Better Understand Individual Differences in Vision, *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 217 Oculomotor Function & Neurology	Spring 2021
UC Berkeley, Neurosci 290A Neuroscience Research Design & Analysis (guest lecturer)	Fall 2020
UC Berkeley, VS 260D Seeing in Time, Space, and Color	Spring 2020
UC Berkeley, VS 217 Oculomotor Function & Neurology	Spring 2020
UC Berkeley, Neurosci 290A Neuroscience Research Design & Analysis (guest lecturer)	Fall 2019
UC Berkeley, VS 260D Seeing in Time, Space, and Color (guest lecturer)	Spring 2019

Dartmouth College, Functional Neuroanatomy	Spring 2018
Dartmouth College, Technology, Psychology & Neuroscience	Spring 2017
Dartmouth College, Functional Neuroanatomy	Spring 2016
UC Berkeley, MCB 61 Brain, Mind & Behavior (graduate student instructor)	Spring 2010
UC Berkeley, MCB 163 Mammalian Neuroanatomy (graduate student instructor)	Fall 2008

Former Advisees

Jonathan Huang, Undergraduate Senior Thesis Student (Computer Science)	2015 – 2017
Tim Tadros, Undergraduate Senior Thesis Student (Computer Science)	2015 – 2017
Irene Feng, Undergraduate Senior Thesis Student (Computer Science)	2016 – 2017
Max Kinateder, Postdoctoral Researcher	2016 – 2018
Thomas Yerxa, Undergraduate Senior Thesis Student (Physics)	2018 – 2019
Zeynep Başgöze, Postdoctoral Researcher	2017 – 2020
Tianhao Cai, Postdoctoral Researcher	2018 – 2020

Other Activities

UC Berkeley

Center for Innovation in Vision and Optics Outreach Program, Coordinator	2020 –
Fiat Lux Scholarship Program, Faculty Interviewer	2020 –
Cognitive Science Major, Affiliated Faculty	2019 –
Vision Science Student Outreach, Faculty Advisor	2019 –
Center for Innovation in Vision and Optics, Co-Director	2018 –
Institute of Cognitive & Brain Sciences, Faculty Member	2018 –
Helen Wills Neuroscience Institute, Graduate Admissions Committee Member	2020 – 2021
Vision Science Graduate Program, Admissions Committee Member	2019 – 2020
Helen Wills Neuroscience Institute, Graduate Admissions Committee Member	2010 – 2011
Mind & Brain Night, After School Activity Night Coordinator	2008 – 2012
Helen Wills Neuroscience Institute, Speaker Series Committee Member	2008 – 2010

External

Society for Information Display Applied Vision Subcommittee, Member	2020 –
Females of Vision et al., Advisory Board Member	2018 –
Community Resources for Science, Middle School Classroom Volunteer	2008 – 2012