Tyler MANNING

Vision Scientist | Neuroscientist

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Researcher skilled in designing, performing, and analyzing experiments in visual perception

Skills

Psychophysics	Display assembly, Psychtoolbox (experimental design, signal recording)
Data analysis	MATLAB (signal processing, descriptive statistics, image statistics), Shell scripting
Computational modeling	MATLAB (Ideal observer models, Bayesian statistics)
Data visualization	MATLAB, Inkscape
Productivity software	LaTeX, Microsoft Office, LibreOffice, Google Workspace

Experience

Sept 2019 - Present

Postdoctoral Researcher, University of California, Berkeley, Berkeley, CA

- Designed and performed experiments investigating the influence of experience with binocular image statistics on visual perception
- Designed, conducted, and analyzed behavioral response data from 6+ perceptual tasks on standard visual displays and head-mounted devices
- Published 1 first-author paper, published 1 coauthored paper, 2 papers in prep
- Obtained and managed competitive F32 NRSA grant from NIH covering $133,872 in research costs
- Organized multidisciplinary team of experimentalists and theoreticians from multiple universities

Psychophysics | Computational modeling | MATLAB | Psychtoolbox | Inkscape | LaTeX

Sept 2013 - June 2019

Graduate Student Researcher, University of California, Davis, Davis, CA

- Designed and performed experiments investigating neurophysiology of image stabilization during eye movements
- Designed analysis pipeline for analyzing electrophysiological and eye movement data
- Developed expert knowledge of spatial vision, object motion, eye-tracking, and self-motion perception in humans and non-human primates
- Published 2 first author papers based on research
- Served as voting member on Graduate Admissions, Student Health Insurance Program, as well as the UCD Graduate Student Association committees

Electrophysiology | Eye tracking | Computational modeling | MATLAB | Inkscape

Projects

Image Statistics and Behavior Constrain Neural Codes for Binocular Disparity — 2020 - 2022

https://github.com/tsmanning/DisparityInfoProject Society for Neuroscience 2021

Here, we investigated how the visual system's representation of binocular disparity varies between brain areas depending upon optimization goals for either information preservation or perceptual discriminability.

Influence of Perceptual Inference on Motion Perception — 2019 - 2022

https://github.com/tsmanning/bayesIdealObserverMoG Vision Sciences Society 2022

This project has focused on how humans transform retinal motion into world motion and make inferences about speed in the face of measurment uncertainty.

Perceptual adaptation to distortions from lenses with unequal magnification — 2019 - 2022

Journal of Vision 2022

I contributed the experimental design and analyses in Iona McLean's paper investigating how people adapt to visual distortions to shape and slant produced by optics with different amounts of magnification.

Image Stabilization in Heading Perception — 2014 - 2019

https://github.com/tsmanning/EfferenceCopyMST Journal of Neuroscience 2019

In this study, I investigated how the brain corrects for distortions in the retinal images while estimating self-motion from optic flow.

Education

2019 **PhD, Neuroscience**, University of California, Davis, Davis, CA, USA
2013 **BSc, Physiology**, McGill University, Montréal, QC, Canada

Selected Publications

2022 **Manning TS**, Naecker BN, McLean IR, Rokers B, Pillow JW, Cooper EA. A general framework for inferring Bayesian ideal observer models from psychophysical data. DOI:10.1523/ENEURO.0144-22.2022

2022 McLean IR, **Manning TS**, Cooper EA. Perceptual adaptation to continuous versus intermittent exposure to spatial distortions. IOVS. 63 (5):29. DOI:10.1167/iovs.63.5.29

2019 **Manning TS**, Britten KH. Retinal stabilization reveals limited influence of extraretinal signals on heading tuning in the medial superior temporal area. J Neurosci. 39 (41) 8064-8078. DOI:10.1523/JNEUROSCI.0388-19.2019

2017 **Manning TS**, Britten KH. Motion processing in primates. Oxford Research Encyclopedia of Neuroscience. DOI:10.1093/acrefore/9780190264086.013.76

Awards and Fellowships

2021 - Present **Ruth L. Kirschstein NRSA Individual Postdoctoral Fellowship**, NEI Grant F32 EY032321
2022 **Vision Sciences Society Travel Award**
2019 - 2020 **Training Program in Vision Science**, NEI Grant T32 EY007043 (PI: Levi DM)
2018 **CoSMo: Summer School in Computational Sensory-Motor Neuroscience**

Interests

Stereovision | Motion perception | Spatial perception | 3D vision
Computational neuroscience | Innovative display technologies | Navigation | Accessibility technology