

Gennady Erlikhman

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ACADEMIC APPOINTMENTS

2018 – present Postdoctoral Researcher UCLA

Advisor: Dr. Hongjing Lu

2014 – 2018 Postdoctoral Scholar University of Nevada, Reno

Sponsor: Dr. Gideon P. Caplovitz

Studying the interaction between form and motion processes and how shapes are represented in the human brain using fMRI, high-density EEG, multivariate analysis methods, and psychophysics.

2015 Adjunct Professor Chapman University

EDUCATION

2014 Ph.D., Psychology UCLA

Dissertation advisor: Dr. Philip J. Kellman

Dissertation title: “Understanding Spatiotemporal Boundary Formation: Processes, Models, Scope”

Studied the formation of shape representations over time using psychophysics and computational modeling approaches.

2010 M.A., Psychology UCLA

2009 B.A., Cognitive Science University of Pennsylvania

PUBLICATIONS

Journal Articles

Erlikhman, G., Gutentag, S., Blair, C., & Caplovitz, G. Interactions of flicker and motion. *In Revision.*

Erlikhman, G., Singh, G., Ghose, T., & Liu, Z. Interactions between adaptive properties of real and illusory contours. *In Revision*

Blair, C., **Erlikhman, G.**, & Caplovitz, G. The Wandering Circles: A flicker-rate and contour dependent motion illusion. *Submitted*

Erlikhman, G., Lytchenko, T., Heller, N., Maechler, M., & Caplovitz, G. P. Object-based perception is object-based, except when it is not. *Submitted*

Erlikhman, G., Fu, M., Dodd, M., & Caplovitz, G. The Motion Induced-Contour Revisited: Observations on 3-D structure and illusory contour formation in moving stimuli. *Journal of Vision, In Press.*

- Baker, N., Lu, H., **Erlikhman, G.**, & Kellman, P. J. (2018) Deep Convolutional Networks do not Classify Based on Global Object Shape. *PLoS Comput Biol* 14(12): e1006613. <https://doi.org/10.1371/journal.pcbi.1006613>
- Baker, N., Kellman, P. J., **Erlikhman, G.** & Lu, H. (2018). *Deep convolutional networks do not perceive illusory contours*. In T.T. Rogers, M. Rau, X. Zhu, & C. W. Kalish (Eds.), *Proceedings of the 40th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society
- Erlikhman, G.**, Caplovitz, G., Gurariy, G., Medina, J., & Snow, J. C. (2018). Towards a unifying perspective of object shape and motion processing in human dorsal cortex. *Consciousness & Cognition*, 64, pp. 106-120.
- McCarthy, D., **Erlikhman, G.**, & Caplovitz, G. P. (2017). The maintenance and updating of representations of no-longer visible objects and their parts. *Progress in Brain Research*, vol. 236, pp. 163-192.
- Erlikhman, G.**, Strother, L., Barzakov, I., & Caplovitz, G. P. (2017). On the legibility of mirror-reflected and rotated text. *Symmetry*, 9(3), 28.
- Erlikhman, G.** & Caplovitz, G. P. (2017). Decoding information about dynamically occluded objects in visual cortex. *NeuroImage*, 146, pp. 778-788.
- Erlikhman, G.**, Gurariy, G., Mruzek R.E.B., & Caplovitz, G. P. (2016). The neural representation of objects formed through the spatiotemporal integration of visual transients. *NeuroImage*, 142, pp. 67-78.
- Erlikhman, G.**, & Kellman, P. J. (2016b). From flashes to edges to objects: Recovery of local edge fragments initiates spatiotemporal boundary formation. *Frontiers in Psychology*, doi: 10.3389/fpsyg.2016.00910.
- Erlikhman, G.**, & Kellman, P. J. (2016a). Modeling spatiotemporal boundary formation. *Vision Research*, 126, pp. 131-142.
- Erlikhman, G.**, Xing, Y. Z., & Kellman, P. J. (2014). Non-rigid illusory contours and global shape transformations defined by spatiotemporal boundary formation. *Frontiers in Human Neuroscience*. 8:978. doi:10.3389/fnhum.2014.00978.
- Keane, B., **Erlikhman, G.**, Kastner, S., Paterno, D., & Silverstein, S. M. (2014). Multiple forms of contour grouping deficits in schizophrenia: What is the role of spatial frequency? *Neuropsychologia*, 65, pp. 221-233.
- Kellman, P.J., Mnookin, J., **Erlikhman, G.**, Garrigan, P., Ghose, T., Mettler, E., Charlton, D., & Dror, I. (2014). Predicting Fingerprint Match Difficulty Using Quantitative Image Measures. *PLoS ONE*, 9(5): e94617.
- Erlikhman, G.**, Keane, B., Mettler, E., Horowitz, T., & Kellman, P. J. (2013). Automatic Feature-Based Grouping During Multiple Object Tracking. *Journal of Experimental Psychology: Human Perception & Performance*, 39(6), 1625-1637
- Polyn, S., **Erlikhman, G.**, & Kahana, M. J. (2011), Semantic cuing and scale-insensitivity of recency and contiguity. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 37(3), 766-775

In preparation

- Erlikhman, G.**, & Caplovitz, G. P. Methods for designing and analyzing behavioral oscillation experiments.
- Erlikhman, G.**, Wu, Y. N., & Lu, H. Representational sparse coding in humans and deep neural networks.
- Erlikhman, G.**, Krekelberg, B., Silverstein, S., & Keane, B. Contour integration deficits in schizophrenia and bipolar disorder.

- Ghose, T., **Erlikhman, G.**, & Kellman, P. J. Interactions of surface and contour completion processes.
- Carrigan, S.*, **Erlikhman, G.***, & Kellman, P. J. Contour linking: A shared mechanism for path detection and illusory contour perception.
- * co-first authorship

Book Chapters

- Erlikhman, G.**, & Caplovitz, G. P. The motion-induced contour revisited. (2018). In *Pioneer Visual Neuroscience: A Festschrift for Naomi Weisstein*. James Brown (Ed.). Routledge.
- Kellman, P. J., Garrigan, P., & **Erlikhman, G.** (2013). Challenges in Understanding Visual Shape Perception and Representation: Bridging Subsymbolic and Symbolic Coding. In *Shape Perception in Human and Computer Vision: An Interdisciplinary Perspective*. Sven Dickinson and Zygmunt Pizlo (Eds.), pp. 249-274.

CONFERENCE TALKS

- Kellman, P. J., Baker, N., **Erlikhman, G.**, & Lu, H. (2017). Classification images reveal that deep learning networks fail to perceive illusory contours. *VSS 2017*
- Kellman, P. J., Carrigan, S. B., & **Erlikhman, G.** (2016). Path Integration and Illusory Contours: Evidence for an Intermediate Representation in Visual Contour Interpolation. *Configural Processing Consortium (CPC) 2016*.
- Erlikhman, G.**, & Caplovitz, G. P. (2016). Representations along the path of apparent motion in visual cortex. *VSS 2016*.
- Erlikhman, G.**, Kellman, P. J., & Caplovitz, G. (2014). Neural correlates of dynamic form in spatiotemporal boundary formation. *Configural Processing Consortium (CPC) 2014*.
- Kellman, P. J., & **Erlikhman, G.** (2014). Spatiotemporal boundary formation: A case study in configural processing. *Configural Processing Consortium (CPC) 2014*.
- Kellman, P. J., & **Erlikhman, G.** (2012). Modeling spatiotemporal boundary formation. *Configural Processing Consortium (CPC)*.
- Keane, B.P., Paterno, D., Suhail-Sindhu, T., **Erlikhman, G.**, Kastner, S., & Silverstein, S.M. (2013). Kanizsa shape discrimination and contour integration deficits in schizophrenia: What is the role of spatial frequency? *Schizophrenia Research*, 153. Supplement 1. Talk presented at Society for Research in Psychopathology.
- Mettler, E., **Erlikhman, G.**, Keane, B., Horowitz, T., & Kellman, P.J. (2012) Further evidence for automatic, feature-based grouping in multiple object tracking. *Journal of Vision*, 12(9), 458. doi:10.1167/12.9.458. Talk presented at Vision Sciences Society (VSS) meeting.

CONFERENCE POSTERS

- Fu, M., **Erlikhman, G.**, Caplovitz, G. P., & Dodd, M. D. (2018). Examining the influence of edge length, distance, and orientation on the Motion-Induced Contour. *VSS 2018*
- Caplovitz, G. P., & **Erlikhman, G.** (2018). The motion-induced contour revisited: Rotations in depth reveal novel illusory contours. *VSS 2018*
- Erlikhman, G.**, Gutentag, S., Blair, C., & Caplovitz, G. P. (2018). Flicker-Induced Induced Motion (and Suppression). *VSS 2018*
- Erlikhman, G.** & Caplovitz, G. P. (2017). Behavioral oscillations in shape perception. *VSS 2017*.

- Caplovitz, G. P. & **Erlikhman, G.** (2017). Behavioral oscillations in perceptual organization. *CNS 2017*
- Kellman, P. J., **Erlikhman, G.**, and Carrigan, S. (2016). Is there a common mechanism for path integration and illusory contour formation? *VSS 2016*.
- Harrison, M., **Erlikhman, G.**, and Caplovitz, G. (2016). Rotating squares made out of drifting Gabors: the contributions of velocity and position based motion information to the perceived speed of a rotating object. *VSS 2016*.
- Caplovitz, G. P., **Erlikhman, G.**, Gurariy, G., and Mruczek, R. (2016). The neural representation of objects formed through the spatiotemporal integration of visual transients. *VSS 2016*.
- Caplovitz, G. P., **Erlikhman, G.**, Gurariy, G., & Mruczek R. (2016). The neural representation of objects formed through the spatiotemporal integration of visual transients. *CNS 2016*.
- Caplovitz, G. P. & **Erlikhman, G.** (2015). Decoding identity of spatiotemporal objects in intermediate and dorsal visual areas. *VSS 2015*.
- Erlikhman, G.** & Kellman, P. J. (2015). Mechanisms of spatiotemporal boundary formation. *VSS 2015*.
- Kellman, P. J. & **Erlikhman, G.** (2015). Understanding and modeling spatiotemporal boundary formation. *VSS 2015*.
- Erlikhman, G.**, Caplovitz, G. P., & Kellman, P. J. (2014). Properties of spatiotemporal boundary formation. *Journal of Vision, 14*(10), p. 61.
- Keane, B., Kastner, S., Paterno, D., **Erlikhman, G.**, & Silverstein, S. M. (2014). Lateral interactions in schizophrenia: What is the role of spatial frequency? *VSS 2014*
- Moses, R., Ghose, T., **Erlikhman, G.**, & Kellman, P. J. (2014). Perceived occlusion velocity for fully visible and fragmented shapes. *Journal of Vision, 14*(10), p. 249-249.
- Ghose, T., **Erlikhman, G.**, Garrigan, P., Mnookin, J., Dror, I., Charleton, D., & Kellman, P.J. (2013). Perception, Image Processing and Fingerprint-Matching Expertise. *Perception, 42*, pp. 11-12.
- Erlikhman, G.**, Ghose, T., Garrigan, P., Mnookin, J., Dror, I., Charleton, D., & Kellman, P.J. (2013). Fingerprint matching expertise and its determinants. *Journal of Vision, 13*(9), p. 51. doi:10.1167/13.9.51
- Caplovitz, G., **Erlikhman, G.**, Lago, J., & Kellman, P. J. (2013). Neural Correlates of Spatiotemporal Boundary Formation (SBF). *Journal of Vision, 13*(9), p. 58.
- Suhail-Sindhu T., Keane, B. P., Paterno, D., **Erlikhman, G.**, Kastner, S., & Silverstein, S. M. (2013). Kanizsa shape discrimination and contour integration deficits in schizophrenia: What is the role of spatial frequency? *Journal of Vision, 13*(9), p. 721.
- Erlikhman, G.**, Ghose, T., & Kellman, P.J. (2012) Contours and surfaces affect stereoscopic depth perception in dynamically specified displays. *Journal of Vision, 12*(9), p. 222. doi:10.1167/12.9.222
- Kellman, P.J., **Erlikhman, G.**, Mansolf, M., Fillinich, R., & Iancu, A. (2012) Modeling Spatiotemporal Boundary Formation. *Journal of Vision, 12*(9), p. 881. doi:10.1167/12.9.881
- Ghose, T., **Erlikhman, G.**, & Kellman, P.J. (2011). Spatiotemporal Object Formation: contour vs. surface interpolation. *Perception, 40* ECVF Abstract Supplement, 59. doi:10.1068/v110609
- Erlikhman, G.**, Ghose T., & Kellman, P.J. (2011). Spatio-Temporal Contour Interpolation in Four Dimensions. *Journal of Vision, 11*(11), p. 1046.
- Mettler E., Keane B. P., **Erlikhman G.**, Horowitz T., & Kellman P.J. (2011). Automatic

- feature-based grouping during multiple object tracking. *Journal of Vision*, 11(11), p. 287.
- Singh, G., **Erlikhman, G.**, Ghose, T., & Liu, Z. (2011). Tilt aftereffects with orientations defined by motion or subjective contours. *Journal of Vision*, 12(9), p. 882.
- Girshick, A., Burge, J., **Erlikhman, G.**, & Banks, M. (2008). Prior expectations in slant perception: Has the visual system internalized natural scene geometry? *Journal of Vision*, 8(6), p. 77.

HONORS, AWARDS, AND FELLOWSHIPS

2015-2018	National Research Service Award (F32) "Neural correlates of spatiotemporal form integration" F32EY025520	NEI, NIH
2016	Postdoctoral Travel Award	University of Nevada, Reno
2013	Short-Term Research Grant (DAAD)	German Academic Exchange Service
2010, 2011	Graduate Division Summer Research Fellowship	UCLA
2009	Distinguished University Fellowship	UCLA

TEACHING EXPERIENCE

Courses

Cognitive Psychology
 Laboratory in Cognitive Science
 Programming for Behavioral Scientists
 Advanced Programming for Behavioral Scientists
 Psychophysics and Signal Detection Theory

Average overall instructor rating for classes taught at UCLA: 8.61/9
 Reviews for any class available upon request.

Training

2017 Neuroimaging training workshop at University of Nebraska
 Part of NIH EPSCOR consortium grant

2016 Workshop on Best Practices in Teaching
 Center for Education Innovation and Learning in the Sciences at UCLA

SERVICE

Mentoring

Undergraduate Independent Study Research Projects:
 Yang Xing, Max Mansolf, Sergio Duran, Anni Wang, Jingqi Yi, Joanne Kang, Sophie Gerrick, Golbahar Azizi, Sion Gutentag, Tara Kohanim, Aaron Gonzalez, Wen-Yao Lee, Jia Hui Ma
Students designed and conducted an experiment, including coding.

Organizer of Matlab summer workshop for undergraduate and graduate students, UCLA
 2010-2013

ad hoc Journal Reviewing:

Vision Research, Journal of Vision, Cerebral Cortex, Frontiers in Psychology, Journal of

Experimental Psychology: General, Perception, NeuroImage, Neuropsychologia, Attention, Perception & Psychophysics, Psychological Review, Advances in Methods and Practices in Psychological Science, Human Brain Mapping, Psychological Bulletin & Review

Professional Societies:

Vision Sciences Society

Demo Night organizer at VSS 2013-present

REFERENCES

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