

# Yuanning Li

## Curriculum Vitae

675 Nelson Rising Lane  
San Francisco, CA 94158  
✉ [yuanningli@gmail.com](mailto:yuanningli@gmail.com)  
📄 [yuanningli.github.io](https://yuanningli.github.io)

### Education

- 2014–2018 **Ph.D.**, *Carnegie Mellon University, Pittsburgh, PA.*  
Joint Neural Computation and Machine Learning Ph.D. program  
**Dissertation:** Neural dynamics and interactions in the human ventral visual pathway  
**Committee:** Avniel Singh Ghuman (co-advisor), Max G. G'Sell (co-advisor), Robert E. Kass, Christopher I. Baker
- 2011–2013 **M.S.**, *Carnegie Mellon University, Pittsburgh, PA.*  
Electrical and Computer Engineering
- 2007–2011 **B.S.**, *Beihang University (BUAA), Beijing, China.*  
Electrical Engineering, School of Advance Engineering (Honors College)

### Work Experience

- 2019–present **Postdoctoral Scholar**, *University of California, San Francisco, CA.*  
Department of Neurological Surgery/Center for Integrative Neuroscience  
Advisor: Edward Chang
- 2014–2018 **Graduate Research Assistant**, *Carnegie Mellon University, Pittsburgh, PA.*  
Center for the Neural Basis of Cognition/Machine Learning Department  
Advisors: Avniel Ghuman and Max G'Sell
- 2013–2018 **Graduate Research Assistant**, *University of Pittsburgh, Pittsburgh, PA.*  
School of Medicine, Department of Neurological Surgery  
Advisor: Avniel Ghuman

### Research Interests

Neural basis of speech and language perception. Computational models of high-level sensory perception. Statistical machine learning for large scale neural data.

### Awards and Honors

- 2020 Outstanding Scholars in Neuroscience Award (OSNAP), National Institutes of Health (NIH)
- 2018 Trainee Professional Development Award (TPDA), Society for Neuroscience (SfN)
- 2018 Fellow of the Kavli Summer Institute in Cognitive Neuroscience, Lake Tahoe, CA
- 2015 Fellow of the Summer Institute in Cognitive Neuroscience, Santa Barbara, CA
- 2015 Multimodal Neuroimaging Training Program (MNTP, NIH training grant), CMU-Pitt
- 2014 R. K. Mellon Presidential Fellowship, CMU
- 2012 Carnegie Institute of Technology Dean's Fellowship, CMU

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## Publications

### *Preprints*

Junfeng Lu\*, **Yuanning Li\*** (equal contributions), Jinsong Wu, and Edward Chang. The control of lexical tone production in human laryngeal motor cortex. (Manuscript in preparation for submission)

Peter Elliott, Matthew Boring, **Yuanning Li**, R. Mark Richardson, Avniel Singh Ghuman, Max G'Sell. Shrinkage Classification for Overlapping Time Series: An interpretable method for mapping stimulus-differentiated evoked response (Submitted, preprint doi: <https://doi.org/10.1101/733279>)

Matthew Boring, Elizabeth Hirshorn, **Yuanning Li**, Michael Ward, R. Mark Richardson, Julie Fiez, Avniel Singh Ghuman. The left midfusiform gyrus interacts with early visual cortex and the anterior temporal lobe to support word individuation (preprint doi: <https://doi.org/10.1101/411579>)

### *Published journal articles*

- 2021 **Yuanning Li**, Claire Tang, Junfeng Lu, Jinsong Wu, and Edward Chang. Human cortical encoding of pitch in tonal and non-tonal languages. *Nature Communications* (2021), In Press.
- 2020 **Yuanning Li**, Michael Ward, R. Mark Richardson, Max G'Sell, and Avniel Singh Ghuman. Endogenous activity modulates neural tuning and predicts perceptual behavior. *Nature Communications*, 11, 4014 (2020). doi: 10.1038/s41467-020-17729-w
- 2018 **Yuanning Li**, R. Mark Richardson, and Avniel Singh Ghuman. Posterior Fusiform and Midfusiform Contribute to Distinct Stages of Facial Expression Processing. *Cerebral Cortex*. 29, no. 7 (2018): 3209-3219. doi: 10.1093/cercor/bhy186
- 2017 **Yuanning Li**, R. Mark Richardson, and Avniel Singh Ghuman. Multi-Connection Pattern Analysis: decoding the representational content of neural communication. *NeuroImage*. 162 (2017) pp. 32-44. doi: 10.1016/j.neuroimage.2017.08.033
- 2017 Hassan Albalawi, **Yuanning Li**, and Xin Li. Training Fixed-Point Classifiers for On-Chip Low-Power Implementation. *ACM Transactions on Design Automation of Electronic Systems (TODAES)*. 22, no. 4 (2017): 69. doi: 10.1145/3057275
- 2016 Elissa Aminoff, **Yuanning Li**, John Pyles, Michael Ward, R. Mark Richardson, Avniel Singh Ghuman. Associative hallucinations result from stimulating left ventral temporal cortex. *Cortex*. 83, (2016): 139-144. doi: 10.1016/j.cortex.2016.07.012
- 2016 Elizabeth Hirshorn\*, **Yuanning Li\*** (equal contributions), Michael Ward, R. Mark Richardson, Julie Fiez, and Avniel Singh Ghuman. Decoding and disrupting left midfusiform gyrus activity during word reading. *Proceedings of the National Academy of Sciences*. 113, no. 29 (2016): 8162-8167. doi: 10.1073/pnas.1604126113
- 2014 Avniel Singh Ghuman, Nicolas Brunet, **Yuanning Li**, Roma Konecky, John Pyles, Shawn Walls, Vincent Destefino, Wei Wang, and R. Mark Richardson. Dynamic encoding of face information in the human fusiform gyrus. *Nature Communications*. 5:5672 (2014), doi: 10.1038/ncomms6672

#### *Peer-reviewed conference proceedings*

- 2014 Hassan Albalawi, **Yuanning Li**, and Xin Li. Computer-aided design of machine learning algorithm: training fixed-point classifier for on-chip low-power implementation. *Proceedings of the 51st ACM/EDAC/IEEE Design Automation Conference (DAC)*. 2014. doi: 10.1145/2593069.2593110 (acceptance rate:  $174/787 = 22.1\%$ )

#### *Book chapters*

- 2020 Ashburn, S. M., et al. Toward a Socially Responsible, Transparent, and Reproducible Cognitive Neuroscience. In Poeppel, D., Mangun, G. R., & Gazzaniga, M. S. (Eds.). (2020). *The Cognitive Neurosciences* (6th Ed.). MIT Press.

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## Conferences and Workshops

#### *Contributed talks*

- 2018 **Yuanning Li**, Michael Ward, R. Mark Richardson, Max G G'Sell and Avniel Singh Ghuman, Endogenous pre-stimulus activity modulates category tuning in ventral temporal cortex and influences behavior, *48th Annual Meeting of Society for Neuroscience (SfN 2018)*, San Diego, CA, 2018
- 2018 **Yuanning Li**, Michael Ward, R. Mark Richardson, Max G G'Sell and Avniel Singh Ghuman, Endogenous oscillatory activity modulates category tuning in ventral temporal cortex, *Vision Sciences Society Eighteenth Annual Meeting (VSS 2018)*, St. Pete Beach, FL, 2018.
- 2018 Matthew Boring, Edward Silson, **Yuanning Li**, Michael Ward, Christopher Baker, R. Mark Richardson, and Avniel Singh Ghuman, Interdigitation of words and faces in the ventral visual stream: reevaluating the spatial organization of category selective cortex using intracranial EEG, *Vision Sciences Society Eighteenth Annual Meeting (VSS 2018)*, St. Pete Beach, FL, 2018. (Talk given by Matthew Boring)
- 2016 **Yuanning Li**, Michael Ward, Witold Lipski, R. Mark Richardson, and Avniel Singh Ghuman, Neurodynamics of expression coding in the core face network, *46th Annual Meeting of Society for Neuroscience (SfN 2016)*, San Diego, CA, 2016

#### *Poster presentations*

- 2021 Emily Stephen, **Yuanning Li**, Sean Metzger, Yulia Oganian, and Edward Chang, Multivariate temporal receptive fields in speech perception reflect low-dimensional dynamics. *Computational and Systems Neuroscience (Cosyne 2021)*, 2021
- 2019 **Yuanning Li**, Claire Tang, Junfeng Lu, Jinsong Wu, and Edward Chang, Lexical tone processing in human superior temporal gyrus, *49th Annual Meeting of Society for Neuroscience (SfN 2019)*, Chicago, IL, 2019
- 2018 **Yuanning Li**, Michael Ward, R. Mark Richardson, Max G G'Sell, and Avniel Singh Ghuman, Endogenous pre-stimulus activity modulates category tuning in ventral temporal cortex and influences perceptual behavior, *2018 Conference on Cognitive Computational Neuroscience (CCN 2018)*, Philadelphia, PA, 2018

- 2017 **Yuanning Li**, Michael Ward, Witold Lipski, R. Mark Richardson, and Avniel Singh Ghuman, Neurodynamics of expression coding in the core face network, *Vision Sciences Society Seventeenth Annual Meeting (VSS 2017)*, St. Pete Beach, FL, 2017. doi: 10.1167/17.10.821
- 2016 **Yuanning Li**, and Avniel Singh Ghuman. Distributed information processing across OFA and FFA represents individual face identities, *Vision Sciences Society Sixteenth Annual Meeting (VSS 2016)*, St. Pete Beach, FL, 2016. doi: 10.1167/16.12.1232
- 2016 Avniel Singh Ghuman, **Yuanning Li**, Elizabeth Hirshorn, Julie Fiez, and R. Mark Richardson. Information processing dynamics in human category-selective fusiform gyrus, *Vision Sciences Society Sixteenth Annual Meeting (VSS 2016)*, St. Pete Beach, FL, 2016. doi: 10.1167/16.12.254
- 2015 **Yuanning Li** and Avniel Singh Ghuman. Multi-connection pattern analysis (MCPA): multivariate discriminant analysis of functional connectivity between neural populations, *45th Annual Meeting of Society for Neuroscience (SfN 2015)*, Chicago, IL, 2015
- 2015 Elissa Aminoff, **Yuanning Li**, John Pyles, Michael Ward, Gena Ghearing, R. Mark Richardson, Avniel Singh Ghuman. Stimulating Associations, *45th Annual Meeting of Society for Neuroscience (SfN 2015)*, Chicago, IL, 2015
- 2015 **Yuanning Li**, Elizabeth Hirshorn, Michael Ward, Roma Konecky, Ellyanna Kessler, Breana Gallagher, R. Mark Richardson, Julie Fiez, and Avniel Singh Ghuman. Decoding the temporal dynamics of left mid-fusiform gyrus activity during word reading, *Seventh International Workshop on Statistical Analysis of Neuronal Data (SAND7)*, Pittsburgh, PA, 2015
- 2014 **Yuanning Li**, Nicolas Brunet, Ellyanna Kessler and Avniel Singh Ghuman. Spatiotemporal analysis of human face individuation. *19th International Conference on Biomagnetism (BIOMAG)*, Halifax, Canada, 2014

## Invited Talks

- 2017 Young Scholar Seminar Series, East China Normal University, Shanghai, China

## Peer Reviewing

- Ad-hoc Reviewer IEEE Transactions on Neural Systems & Rehabilitation Engineering (TNSRE), IEEE Journal of Biomedical and Health Informatics (JBHI), PLOS One, PLOS Computational Biology, NeuroImage, Journal of Neurophysiology, Science Advances, AAAI Conference on Artificial Intelligence (AAAI)

## Teaching

- Spring 2018 **Teaching Assistant**, *Carnegie Mellon University*, Pittsburgh, PA.  
10-708 Probabilistic Graphical Models (Machine Learning Ph.D. core course)
- Summer 2016 **Teaching Assistant**, *Center for the Neural Basis of Cognition, CMU-Pitt*.  
Summer course for the undergraduate program in neural computation (uPNC)
- Spring 2013 **Teaching Assistant**, *Carnegie Mellon University*, Pittsburgh, PA.  
18-202 Mathematical Foundations of Electrical Engineering (ECE undergraduate course)

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## Programming Skills

Proficient in Python, MATLAB,  $\text{\LaTeX}$

Capable in C, C++, Java, R

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## References

**Edward F. Chang**, *edward.chang@ucsf.edu*.

Professor, University of California San Francisco

**Avniel Singh Ghuman**, *ghumana@upmc.edu*.

Associate Professor, University of Pittsburgh

**R. Mark Richardson**, *mark.richardson@mgh.harvard.edu*.

Associate Professor, Harvard Medical School

**Max G. G'Sell**, *mgsell@andrew.cmu.edu*.

Assistant Professor, Carnegie Mellon University

**Robert E. Kass**, *kass@stat.cmu.edu*.

Professor, Carnegie Mellon University

**Julie A. Fiez**, *fiez@pitt.edu*.

Professor, University of Pittsburgh