

CHANDRAMOULI CHANDRASEKARAN

Anatomy & Neurobiology, and Psychological and Brain Sciences, Boston University

Phone: 609 933 4323 Email: cchandr1@bu.edu, mailchand@gmail.com

Home Page: www.chandlab.org

Academic Positions

Assistant Professor of Psychology and Brain Sciences, and Anatomy & Neurobiology Jan 2019 - Present
Boston University, Boston, MA, USA

Research Specialist I Sep. 2017 - Dec 2018
Shenoy Lab, Stanford University and Howard Hughes Medical Institute
Mentor: Prof. Krishna Shenoy, Collaborators: Prof. Newsome, Prof. Sahani

Postdoctoral Fellow Sep. 2011 - Sep 2017
Shenoy Lab, Stanford University
Mentor: Prof. Krishna Shenoy, Collaborators: Prof. Newsome, Prof. Sahani

Education

Ph.D. in Psychology and Neuroscience 2006-2011
Department of Psychology and Neuroscience Institute
Princeton University

M.A. Psychology 2006-2008
Department of Psychology and Neuroscience Institute
Princeton University
Advisor: Prof. Asif A Ghazanfar.

M.Sc. Neural and Behavioral Sciences 2003-2005
University of Tübingen, Germany
International Max Planck Research School

B.Tech Information Technology 1999-2003
University of Madras, Chennai, India

Funding

K99, Career Development Award, NINDS, K99NS092972 July 2015 - July 2017
Organization and Dynamics of Premotor and Prefrontal Cortical Circuits Mediating Goal-Directed Behavior.
Mentors: Prof. Krishna Shenoy, Prof. William T Newsome, Prof. Maneesh Sahani.

R00, Transition Award Sep 2018 - Oct 2021
Organization and Dynamics in Premotor and Prefrontal Cortical Circuits Mediating Goal-Directed Behavior,
4R00NS092972-03

Publications

Manuscripts in Review/Revision/in Submission

1. Chandrasekaran C, Gondan MG, *Audiovisual detection at different intensities and delays*, revised and resubmitted to Journal of Mathematical Psychology. See biorxiv submission (<https://doi.org/10.1101/173773>).

2. **Chandrasekaran C**, Soldado-Magraner J, Peixoto D, Newsome WT, Sahani M, Shenoy KV, *Brittleness in model selection analysis of single neuron firing rates*, under review, (<https://doi.org/10.1101/430710>).
3. Peixoto D, Kiani R, **Chandrasekaran C**, Shenoy KV, Newsome WT, *Population dynamics of choice representation in dorsal premotor and primary motor cortex*, under review, see biorxiv submission. (<https://doi.org/10.1101/283960>).

Published

1. Wang MW, Montanede C, **Chandrasekaran C**, Peixoto D, Shenoy KV, Kalaska JF, *Macaque dorsal premotor cortex exhibits decision-related activity only when specific stimulus-response associations are known*. in press, for Nature Communications (<https://doi.org/10.1101/412528>)
2. **Chandrasekaran C**, Bray IE, Shenoy KV, *Frequency shifts and depth dependence of beta band activity in the dorsal premotor cortex during perceptual decision-making*, in press for Journal of Neuroscience, See biorxiv submission (<https://doi.org/10.1101/306753>).
3. O'Shea DJ, Kalanithi P, Ferenczi E, Hsueh B, **Chandrasekaran C**, Goo W, Ramakrishnan C, Diester I, Kaufman MT, Yeom K, Deisseroth K, Shenoy KV (2018) *Development of a new world primate model for rapid optogenetic neural circuit dissection*, Scientific Reports, volume 8, Article number: 6775 (2018).
4. **Chandrasekaran C**, Peixoto D, Newsome WT, Shenoy KV (2017), *Laminar differences in decision-related neural activity in dorsal premotor cortex*, Nature Communications 8, 614, (doi:10.1038/s41467-017-00715-0).
5. **Chandrasekaran C** (2017) *Computational Models and Principles of Multisensory Integration*, Review in Current Opinion in Neurobiology for special issue on Neurobiology of Learning and Plasticity. 43, 25-34 (2017).
6. O'Shea DJ, Trautmann E, **Chandrasekaran C**, Stavisky SD, Kao JC, Sahani M, Ryu S, Shenoy KV (2017), *The need for calcium imaging in nonhuman primates: new motor neuroscience and brain-machine interfaces*. Experimental Neurology (review), 287, 437-451.
7. **Chandrasekaran C**, Lemus L, Ghazanfar AA (2013), *Dynamic faces speed up the onset of auditory cortical spiking responses during vocal detection*, Proceedings of the National Academy of Sciences, 110 (48), E4668-E4677.
8. **Chandrasekaran C**, Lemus L, Trubanova A, Gondan M and Ghazanfar AA (2011), *Monkeys and humans share a common computation for face/voice integration*, PLoS Computational Biology, 7: e1002165.
9. **Chandrasekaran C**, Turesson HK, Charles Brown, Ghazanfar AA (2010), *The Influence of Natural Scene Dynamics on Auditory Cortical Activity*, J Neurosci 30: 13919-13931.
10. **Chandrasekaran C**, Turner L, Bühlhoff HH & Thornton, IM (2010), *Attentional networks and biological motion*, Psikologija, 43(1), 5-20.
11. Ghazanfar AA, **Chandrasekaran C**, Morrill RJ (2009), *Rhythmic Facial Expressions and the Superior Temporal Sulcus of Macaque Monkeys: Implications for the Evolution of Audiovisual Speech*, European Journal of Neuroscience 31: 1807-1817.
12. **Chandrasekaran C**, Trubanova A, Stillitano S, Caplier A, Ghazanfar AA (2009), *The Natural Statistics of Audiovisual Speech*, PLoS Comput Biol 5(7): e1000436.
13. **Chandrasekaran C**, Ghazanfar AA (2009), *Different Neural Frequency Bands Integrate Faces & Voices Differently in the Superior Temporal Sulcus*, J Neurophysiol, Feb 101(2): 773-788.
14. Maier JX, **Chandrasekaran C**, Ghazanfar AA (2008), *Integration of Bimodal Looming Signals through Neuronal Coherence in the Temporal Lobe*, Current Biology, 18(13): 963-968.
15. Ghazanfar AA, **Chandrasekaran C**, Logothetis NK (2008), *Interactions between the Superior Temporal Sulcus and Auditory Cortex Mediate Dynamic Face/Voice Integration in Rhesus Monkeys*, J Neurosci, 28: 4457-4469.
16. **Chandrasekaran C**, Canon V, Dahmen JC, Kourtzi Z, Welchman AE (2007), *Neural Correlates of Disparity-Defined Shape Discrimination in the Human Brain*, J Neurophysiol. Feb; 97(2): 1553-65.

Previews, Technical Reports & Book Chapters

1. Ghazanfar AA, **Chandrasekaran C** (2012), *The Influence of Vision on Auditory Communication in Primates*, In Neural Correlates of Auditory Cognition, Springer Handbook for Auditory Research (SHAR). Edited by Cohen YE, Popper AN, and Fay RR. Springer Press.

2. Ghazanfar AA, **Chandrasekaran C** (2012), *Non-human Primate Models of Audiovisual Communication*, In *The New Handbook of Multisensory Processes*. Edited by Stein BE. MIT Press. Pages: 407-420.
3. **Chandrasekaran C**, Ghazanfar AA (2012), *Coding Across Sensory Modalities: Integrating the Dynamic Face With The Voice In Principles of neural coding*, edited by Quiñero R & Panzeri S. Taylor & Francis Press.
4. **Chandrasekaran C**, Ghazanfar AA (2011), *When what you see is not what you hear*, *Nature Neuroscience*, Jun;14(6):675-6.
5. Ghazanfar AA, **Chandrasekaran C** (2007), *Paving the Way Forward: Integrating the Senses through Phase-Resetting of Cortical Oscillations*, *Neuron*. Jan 18;53(2): 162-4.
6. **Chandrasekaran C**, Thornton IM, Bühlhoff HH (2006), *Selective Attention and Biological Motion*, Max Planck Institute for Biological Cybernetics, Technical Report 139.

In Preparation

1. **Chandrasekaran C**, Shenoy KV, *Population neural dynamics in PMd during a RT decision-making task*, In preparation.
2. **Chandrasekaran C**, Hawkins G *CHaRT: An R toolbox for modeling Choice and RT data from decision-making tasks*, In preparation for *J Neuroscience Methods*.

Selected Oral and Poster Presentations

1. **Chandrasekaran C**, Shenoy KV, *Urgency-related neural population dynamics in the dorsal premotor cortex during a reach reaction time decision-making task*, Society for Neuroscience Nanosymposium Talk(SFN), November 2018
2. Wang MW, **Chandrasekaran C**, Shenoy KV, *Macaque premotor cortex activity and behavior support embodied choice model of decision-making*, Society for Neuroscience (SFN), November 2018.
3. **Chandrasekaran C**, Shenoy KV, *Using action potential width and cortical depth to characterize laminar microcircuit organization in macaque dorsal premotor cortex during perceptual decisions*, Society for Neuroscience (SFN), November 2017.
4. Bray IE, **Chandrasekaran C**, Shenoy KV, *Frequency shifts and depth dependence of pre-stimulus beta band activity in rhesus premotor cortex during perceptual decision-making*, Society for Neuroscience (SFN), November 2017.
5. **Chandrasekaran C**, Soldado-Magraner J, Peixoto D, Newsome WT, Sahani M, Shenoy KV, *Do decision-related firing rates of dorsal premotor cortex neurons “ramp” or “step” on single trials?*, Society for Neuroscience (SFN), nano symposium on decision-making, November 2016.
6. Wang MW, **Chandrasekaran C**, Peixoto D, Newsome WT, Shenoy KV, *Dorsal premotor cortex activity reflects a candidate decision variable during the action selection epoch of an abstract perceptual decision-making task*, November 2016, poster presented by Wang MW.
7. Peixoto D, Kiani R, Kao JC, Nuyujukian P, **Chandrasekaran C**, Brown JR, Fong S, Shenoy KV, Newsome WT, *Real-time decoding of a decision variable during a perceptual discrimination task*, November 2016, nano symposium on decision-making, Talk presented by Peixoto D.

Mentoring

- Ms. Megan Wang, Graduate student, Shenoy lab, Stanford, 2015-present.
- Ms. Iliana Erteza Bray, Summer undergraduate research and honors thesis in the Shenoy Lab, Stanford, 2016-2017. Currently Graduate student in Electrical Engineering at Stanford.
- Dr. Marco Lanzilotto, visiting graduate student in the Ghazanfar Lab, Princeton, 2010-2011. Currently a postdoctoral fellow at the University of Parma, Italy.
- Ms. Andrea Trubanova, senior undergraduate thesis in Ghazanfar Lab, Princeton, 2009-2010. Currently a graduate student, Virginia Tech.

Teaching

Teaching Assistant, *MOL 408-Cellular and Systems Neuroscience* Fall 2009

Profs. Michael Berry and Uri Hasson.

I created problem sets and exams, expanded on the concepts from class for juniors and seniors at Princeton University, and led office hours. Average course evaluation from 28 students: 4.59/5.

Teaching Assistant, *PSY 251-Quantitative Methods* Spring 2010

Prof. Harvey Keselman.

I taught the lab component, created and designed homeworks, and also the in class review material. Average course evaluation from 46 students, 3.96/5.

Invited Talks

1. University of Tuebingen Alumni Meeting, University of Tuebingen, September 2018.
2. Lab meeting talk, Ganguly Lab, UCSF, May 2018.
3. Stanford University, Neurobiology Floor Talk, Stanford, CA, USA, April 2018.
4. Boston University, Joint talk to Departments of Biology and Psychology, MA, November 2017.
5. Simons Collaboration on the Global Brain Postdoctoral Talks, UCSF, CA, June 2017.
6. Boston University, Department of Anatomy and Neurobiology, Boston, MA, May 2017.
7. Center for Neuroscience, Indian Institute of Science, Bangalore, India, February 2017.
8. Stanford Research Institute, Menlo Park, CA, December 2016.
9. Department of Neuroscience, Yale University, February 2016.
10. Department of Psychology, University of California, Berkeley, December 2015.
11. Moore Lab, Stanford University, Stanford, September 2015.
12. Plexon Workshop Talk on using multicontact electrodes for neurophysiology, Dallas, April 2015.
13. Princeton University (Invited by Prof. Ghazanfar), Princeton, November 2014.
14. New York University (Invited by Prof. Kiani), New York, November 2014.
15. Math, Monkeys and Machines, Stanford University, Stanford, October 2014.
16. Memory and Decision Lunch, Psychology Department, Stanford University, Stanford, February 2014.
17. Joint Lab Meeting, Norcia and Newsome Labs, Stanford University, Stanford, December 2013.
18. Joint Lab Meeting, Yu, Batista and Chase labs, Carnegie Mellon University, Pittsburgh, September 2013.
19. Freiwald Lab, Rockefeller University, New York, March 2013.
20. Churchland Lab, Columbia University, New York, March 2013.
21. Hoffman Scholar Awards, Princeton University, Princeton, March 2011.
22. Princeton Research Symposium, Princeton, November 2010.
23. Neural Prosthetic Systems Laboratory (NPSL), Shenoy Lab, Stanford University, Stanford, May 2010.
24. Neuroscience Retreat, Princeton Neuroscience Institute, Princeton, September 2009.

Selected Awards

- *Hoffman Scholar Award*, 2011, awarded by Alumni Council of Princeton University for dissertations.
- *Graduate Student Travel Award*, 2010, Advances and Perspectives in Auditory Neurophysiology (APAN).
- *Charlotte Elizabeth Procter Fellow*, 2010-11, Honoric Dissertation Fellowship, Princeton University.
- *Quantitative Computational Neuroscience Training Grant*, 2007-2009, Princeton University.
- *Graduate Fellow*, Mathey College, Princeton University, 2007-2010.
- *Centennial Fellowship*, 2006-2011, Princeton University.
- *Outstanding Student Award*, 2003, Sri Venkateswara College of Engineering, awarded by the college for best outgoing student.
- *Upsilon Pi Epsilon Award*, 2003, awarded by the IEEE computer society for excellence in academics and research.
- *Driescher Panickker Award*, 2002, Sri Venkateswara College of Engineering, for general academic achievement and extracurricular activities.

Service/Leadership

- Co-organizer with Dr. Vincent McGinty of an Animal Research Workshop, May 2016. We invited key individuals from Stanford's public relations department to teach a seminar that provides guidance and strategies for interacting with the media on animal research issues.
- Ad Hoc Reviewer for Journal of Neuroscience, Developmental Science, Journal of Neurophysiology, PLoS Computational Biology, PLoS Biology, Neuropsychologia, Neuroimage, Seeing and Perceiving, Journal of Acoustic Society of America, Experimental Brain Research.
- Co-organizer with Dr. Vincent McGinty, Dr. Subhaneil Lahiri and Dr. Tatiana Engel of "Math, Monkeys and Machines", a theoretical, computational, and systems neuroscience seminar series comprising short 15 minute talks by Stanford postdocs and graduate students. 2014-2015
- Ad-hoc Student Host for visiting Neuroscience Institute/Psychology Department speakers, Princeton University.
- Graduate Student Committee, 2009-2010, Psychology Department.
- Co-organizer along with Dr. Bingni Brunton for Neuroscience graduate student recruiting, February 2009.
- Psychology Department colloquium committee, 2007-2008.
- Orientation day for new graduate students in the Psychology Department, September 2007.

References

Prof. Krishna Shenoy Stanford University shenoy@stanford.edu <i>Post Doctoral Mentor</i>	Prof. William T Newsome Stanford University bnewsome@stanford.edu <i>Post Doctoral Collaborator</i>	Prof. Maneesh Sahani University College London maneesh@gatsby.ucl.ac.uk <i>Post Doctoral Collaborator</i>
Prof. Asif A Ghazanfar Princeton University asifg@princeton.edu <i>Dissertation Advisor</i>	Prof. Sabine Kastner Princeton University skastner@princeton.edu <i>Second Dissertation Advisor</i>	