Pushpita Bhattacharyya

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EDUCATION

M.S., Psychological and Brain Sciences **August 2023**
University of Delaware, Newark, DE

B.S., Cognitive Science w/ specialization in Neuroscience **September 2018**
University of California, San Diego, La Jolla, CA

SKILLS

- **Experimental Design** – Psychophysics, survey design, neurocognitive testing, EEG, fMRI
- **Data analysis** – Neural data analysis (EEG, fMRI, fiber photometry), behavioral data analysis (psychophysics, motion-tracking), signal processing, proteomics
- **Statistical Methods** – Bayesian statistics, mixed-effects modeling, model selection, multivariate pattern analysis
- **Programming/Software** – Python, MATLAB, R, Bash scripting, Qualtrics, Visual Studio Code, Github
- **Public Speaking** – Presenting complex subject matter to expert and non-expert audiences
- **Scientific & Technical Writing** – Journal articles, grant proposals, abstracts, lab manuals, code documentation
- **Interpersonal Communication** – Working with cross-functional teams; Communicating professionally with equipment suppliers, IRB coordinators, research subjects (blind, sighted) and collaborators via email, phone, Zoom, Slack, etc.

EXPERIENCE

Research Associate **October 2023 – Present**
Smith-Kettlewell Eye Research Institute, San Francisco, CA
Director: Dr. Santani Teng

- Collecting, preprocessing, and analyzing EEG and behavioral data (R; MATLAB)
- Developing software code for experimental presentation (Psychtoolbox; Psychopy)
- Designing and implementing novel research experiments to study neurocognitive mechanisms of echolocation and braille reading in blind individuals
- Preparing manuscripts and presentations for scientific dissemination and grant proposals
- Training and supervising lab interns in data collection and analysis
- Managing lab logistics (inventory, data management) and paperwork (IRB protocols, consent forms, training materials)
- Research projects: 1. Neurocognitive dynamics of braille reading; 2. Optimizing echoacoustic signals to aid mobility and perception for blind individuals via assistive technology

Research Associate **Aug 2023 - Sep 2023**
Dhong Lab, MSE Department., University of Delaware, Newark, DE
Director: Dr. Charles Dhong

- Conducted psychophysics experiments to study how mechanical forces during haptic exploration inform tactile perception in blind, low-vision and sighted adults
- Designed user studies to test the efficacy of new tactile aids developed in the lab for blind and low-vision adults

- Advised biomedical engineering graduate students on appropriate statistical tests and analyses to draw conclusions from human behavioral data
- Provided programming support in R using specialized toolboxes to analyze psychophysical data

Graduate Researcher **Aug 2020 – Aug 2023**

Cognitive Neuropsychology Lab, University of Delaware, Newark, DE

Advisor: Dr. Jared Medina

- Led two end-to-end research projects, from defining research questions, to designing experiments, acquiring and analyzing data, and communicating results
- Drafted a manuscript for journal submission as first author, reporting novel findings from two new experiments
- Presented key findings and led discussions in meetings with cross-disciplinary research teams
- Master's Thesis: The interaction of top-down and bottom-up factors influencing multisensory integration in the mirror-box illusion
- Secondary project: The role of frictional instabilities in fine touch perception

Graduate Teaching Assistant **Aug 2020 – Dec 2022**

Psychological and Brain Science Dept., University of Delaware, Newark, DE

- Provided out-of-classroom instructional support to 500+ undergraduate students taking psychology and neuroscience courses
- Held regular office hours and review sessions to clarify challenging concepts before exams
- Graded assignments, proctored exams and managed the course website

Research Technician **Dec 2019 – Aug 2020**

Contet Lab, Scripps Research, La Jolla, CA

Director: Candice Contet

- Wrote scripts in R and MATLAB to analyze neural time series data (fiber photometry), behavioral data (mouse models) and proteomics data (LC-MS)
- Troubleshot technical issues with neural data collection software and hardware
- Research projects: 1. Brain signaling pathways associated with withdrawal symptoms in alcohol-dependent mice; 2. Molecular changes in brain regions of alcohol-dependent mice; 3. Circadian rhythm changes associated with alcohol dependence

Research Assistant **Jan 2019 – Oct 2019**

Neural Engineering and Translation Labs, UCSD, La Jolla, CA

Directors: Dr. Jyoti Mishra, Dr. Dhakshin Ramanathan

- Recruited and screened participants
- Administered neurocognitive experiments to collect EEG and behavioral data
- Collected clinical demographics data using REDCap
- Programmed preprocessing pipelines in MATLAB for EEG and behavioral data analysis

Lab Manager **Sep 2018 – Oct 2019**

Center for Brain and Cognition, UCSD, La Jolla, CA

Director: Dr. V. S. Ramachandran

- Delivered two end-to-end research projects, leading to a conference presentation (SfN 2019) and a co-authored publication in Multisensory Research (2020)
- Trained research assistants in lab protocol, data collection and analysis

- Performed technical troubleshooting and routine maintenance on lab equipment, computers, and other devices.
- Prepared grant proposals, journal manuscripts, posters and slides for conference presentations
- Research projects: 1. Grapheme-color synesthesia in an abugida – a Bengali case study; 2. The role of sound-form symbolism ('bouba-kiki effect') on memory consolidation

Undergraduate Researcher **Feb 2017 – Sep 2018**

Center for Brain and Cognition, UCSD, La Jolla, CA

Advisor: Dr. V. S. Ramachandran

- Designed and implemented cognitive psychology experiments to address research questions involving cross-modal processing, visual perception and music cognition
- Undergraduate thesis: 'Music as a protolanguage' – Cross-cultural perception of emotion through speech prosody and melody

Data Analyst **Aug 2014 – Jan 2016**

Scripps Institution of Oceanography, La Jolla, CA

Director: Dr. Aaron Thode

- Processed and analyzed spectrogram and audio data of humpback and bowhead whale calls, using custom-made MATLAB software.
- Identified novel humpback whale calls and their key acoustic features to create a database documenting humpback whale dialects in the Baja, California region.

JOURNAL ARTICLES/MANUSCRIPTS

- **Bhattacharyya, P.**, Medina, J. (in preparation) Differences in visual capture of connected body parts in the mirror-box illusion reflect local variations in cross-modal congruence and unimodal variance.
- Derkaloustian, M., **Bhattacharyya, P.**, Ngo, T., Cashaback, J. G. A., Medina, J., & Dhong, C. B. (2025). Alternatives to Friction Coefficient: Role of Frictional Instabilities on Fine Touch Perception. bioRxiv : the preprint server for biology, 2024.10.25.620351. https://doi.org/10.1101/2024.10.25.620351
- Swain, Z., Derkaloustian, M., Hepler, K. A., Nolin, A., Damani, V. S., **Bhattacharyya, P.**, Shrestha, T., Medina, J., Kayser, L. V., Dhong, C. B. (2024). Self-assembled thin films as alternative surface textures in assistive aids with users who are blind. Journal of Materials Chemistry B, 12(39), 10068-10081. doi: https://doi.org/10.1039/D4TB01646G
- Okhuarobo, A., Kreifeldt, M., Gandhi, P. J., Lopez, C., Martinez, B., Fleck, K., Bajo, M., **Bhattacharyya, P.**, Dopico, A. M., Roberto, M., Roberts, A. J., Homanics, G. E., Contet, C. (2023). Ethanol's interaction with BK channel α subunit residue K361 does not mediate behavioral responses to alcohol in mice. Molecular Psychiatry, 1-14. doi: https://doi.org/10.1038/s41380-023-02346-y
- Root, N., **Bhattacharyya, P.,** & Ramachandran, V. S. (2020). Grapheme–Color Synesthesia in an Abugida: a Bengali Case Study. Multisensory Research, 34(2), 187-218. doi: https://doi.org/10.1163/22134808-bja10036

CONFERENCE PRESENTATIONS / ABSTRACTS

- **Bhattacharyya, P.**, Tam, R., Reynolds, I., Orsmond, P., & Teng, S. (2025, July 15-18). *Optimizing Signal Parameters to Enhance Echoacoustic Perception of Objects and Scenes in Humans* [Poster presentation]. International Multisensory Research Forum 2025, Durham, UK.
- **Bhattacharyya, P.*,** Tam, R., Orsmond, P., Hicks, S., Teng, S. (2025, Mar 29 - Apr 1). *Time-resolved EEG decoding of neural text representations during naturalistic braille reading* [Poster presentation]. Cognitive Neuroscience Society 2025, Boston, MA, United States.
- **Bhattacharyya, P.***, Reynolds, I., Tam, R., Jackson, K., Teng, S. (2024, September 13) *Optimizing signal parameters to enhance echoacoustic perception of objects in humans* [Poster presentation]. Bay Area Vision Research Day 2024, Berkeley, CA, United States.
- Garcia-Lazaro, H. G.*, **Bhattacharyya, P.**, Chao, B., Teng, S. (2024, May 17-22). *Perceptual mechanisms underlying human click-based echolocation* [Conference talk abstract]. Vision Sciences Society 2024, St. Pete's Beach, FL, United States. doi: https://doi.org/10.1167/jov.24.10.1480
- Ramachandran, V.S., **Bhattacharyya, P.***, Marcus, Z., Sen, R., Vonkleist, K., Chunharas, C. (2019) *Memory Consolidation in Sound-Form Symbolism (Bouba-Kiki) and Word-Color Concordance* [Poster presentation]. Society for Neuroscience 2019, Chicago, IL, United States

**presenting author*