

Jyoti Mishra

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ACADEMIC HISTORY

- May 2008 - Present** Postdoctoral Fellow, Dept. of Neurosciences
University of California, San Diego
- Sept. 2003 - March 2008** **Ph.D., Biology with specialization in Computational Neurobiology**
University of California, San Diego
Dissertation: Neural Processes underlying an Auditory-induced Visual Illusion
Advisor: Dr. Steven A. Hillyard, Dept. of Neurosciences
Co-advisor: Dr. Terrence J. Sejnowski, Salk Institute
- 2000 - 2003** **M.Sc., Life Sciences**
National Center for Biological Sciences, India
Dissertation: Spatiotemporal modulation of Store-Released Calcium Dynamics in Neurons
Advisor: Dr. Upinder S. Bhalla
- 1997-2000** **B.Sc., Biochemistry with Honors**
Sri Venkateswara College, Delhi University, India
Ranked 1st in the University year 1998; 2nd in year 2000

HONORS AND AWARDS

- 2006 Graduate Student award, International Multisensory Research Forum.
- 2004 Graduate Internship award, RIKEN-Brain Research Institute, Japan.
- 2003-2004 NSF Integrative Graduate Education and Research Training (IGERT) award.
- 2003 TIFR Alumni Association Scholarship for Career Development, India.
- 2000-2003 NCBS-TIFR Junior Scholarship, India.
- 2000 1st place. Bioinformatics & recent advances session, Biotechcellence, National Students' Biotechnology Symposium, India.
- 2000 1st place. All India Masters in Biotechnology Combined Entrance.
- 2000 1st place. All India Institute of Medical Sciences M.S. Biotechnology Entrance.
- 2000 1st place. Ambedkar Center for Biomedical Research Post-Graduate Entrance.
- 1997-2000 1st place. All India Entrance Scholarship, Delhi University, India

RESEARCH EXPERIENCE

- May 2008 - present Postdoctoral research with Dr. Steven A. Hillyard, UCSD
- *Investigating the contribution of EEG phase reset to the generation of the evoked potential to an attended visual stimulus.*
- Sept. 2004 - Mar. 2008 Ph.D. research with Dr. Steven A. Hillyard, UCSD
- *Investigating neural correlates of sound induced visual illusions.*
- May. - Aug. 2004 Internship with Dr. M. Tanifuji, RIKEN, Japan.
- *Characterization and mapping of primate visual cortex using continuous intrinsic signal imaging.*
- Jan. - May 2004 Graduate research with Dr. T. Sejnowski, UCSD
- *Building a realistic biophysical neuronal model of visual attention.*
- 2001 - 2003 Masters' research with Dr. U.S. Bhalla
National Center for Biological Sciences, India
- *Building a laser confocal microscopy setup to study calcium transients in neuronal cultures.*
- *Computational modeling and simulations of $InsP_3$ mediated calcium release in neurons.*
- May - June 2001 Internship with Dr. R. Balakrishnan
Indian Institute of Science (IISc), India
- *Classification of the local tree cricket population and characterization of their song structure.*
- Jan. - May 2001 Masters' research with Dr. M. M. Panicker
National Center for Biological Sciences, India
- *Characterization of the upstream promoter region of the serotonin 5-HT_{2A} receptor gene using molecular biology methods.*
- 1999 Undergraduate research with Dr. V. Kothekar
All India Institute of Medical Sciences, India.
- *Monte Carlo simulations of optimal drug docking at the Cyclooxygenase-2 enzyme active site.*

TEACHING EXPERIENCE

Teaching Assistantships (UCSD)

- 2007, 2005 Information Processing in the Human Brain (S. Hillyard), Fall
2006 Basic Neurology; School of Medicine (M. Kritchevsky), Spring
2005 Mammalian Physiology (K. French), Spring

Guest Lectures

- 2007 Summer Camp Grades 5-8 (Reuben Fleet Science Center, San Diego)

Tutoring

- 2004 Physics, Chemistry & Maths (Chula Vista High, San Diego), Winter
- as part of UCSD OASIS program

REVIEWS

Journals: Brain Research

Ad-hoc Reviewer: Nature, Neural Computation, Neuroreport, Trends in Neurosciences

PUBLICATIONS

Ph.D. research

Mishra J, Martinez A, Hillyard SA. Cortical Processes Underlying Sound-Induced Flash Fusion. Brain Research. *in press* 2008.

Mishra J, Hillyard SA. Endogenous attention selection during binocular rivalry at early stages of visual processing. Vision Research. doi:10.1016/j.visres.2008.02.018.

Bonath B, Noesselt T, Martinez A, **Mishra J**, Schwiecker K, Heinze H, Hillyard SA. Neural basis of the Ventriloquist illusion. Current Biology: 17: 1-7. 2007.

Mishra J, Martinez A, Sejnowski TJ, Hillyard SA. Early cross-modal interactions in auditory and visual cortex underlie a sound-induced visual illusion. Journal of Neuroscience 27: 4120-4131. 2007.

Media Coverage:

UCSD News (04.11.07) - Wired for Sound: How the brain senses visual illusion.

LiveScience.com (04.11.07) - How sight and sound can trick your brain.

News.Sawf.org (04.12.07) - Audio and visual stimuli can trick brain to see things that are not present.

Mishra J, Fellous JM, and Sejnowski TJ. Selective attention through phase relationship of excitatory and inhibitory input synchrony in a model cortical neuron. Neural Networks 19: 1329-46. 2006.

Masters' research

Mishra J, and Bhalla US. Simulations of Inositol Phosphate Metabolism and its Interaction with InsP₃ mediated Calcium Release. Biophysical Journal 83: 1298-1316. 2002.

Sivakumaran S, Hariharaputran S, **Mishra J**, and Bhalla US. The Database of Quantitative Cellular Signaling: management and analysis of chemical kinetic models of signaling networks. Bioinformatics 19: 408-415. 2003.

Undergraduate research

Kothekar V, Sahi S, Srinivasan M, Mohan A, and **Mishra J**. Recognition of cyclooxygenase-2 (COX-2) active site by NSAIDs: a computer modeling study. Indian Journal of Biochemistry & Biophysics 38: 56-63. 2001.

Kothekar V, Sahi S, and **Mishra J**. Molecular dynamics simulation of the interaction of 5-keto substituted 7-*tert*-butyl-2,3-dihydro-3,3-dimethylbenzofuran derivatives with cyclooxygenase-2. Current Science 80: 764-770. 2001.

Kothekar V, Sahi S, and **Mishra J**. Enzyme selectivity of new cyclooxygenase-2/5 lipoxygenase inhibitors using molecular modeling approach. Indian Journal of Biochemistry & Biophysics 37: 86-96. 2000.

In Preparation

Mishra J, Martinez A, Hillyard SA. Effect of Attention on Early Cortical Processes underlying the Sound-induced Extra Flash Illusion. 2008 (*Journal of Cognitive Neuroscience*).

Mishra J, Martinez A, Hillyard SA. Sound-Induced Extra Flash Illusion influences Visual Features. 2008.

CONFERENCE PRESENTATIONS

Mishra J, Martinez A, Sejnowski TJ, and Hillyard SA. Effect of attention on cortical processes underlying the sound induced extra flash illusion. Cognitive Neuroscience Society Poster D57. New York 2007.

Mishra J, Martinez A, Salejarvi WT, Sejnowski TJ, and Hillyard SA. Cortical processes underlying the sound induced visual illusion. International Multisensory Research Forum, Graduate Student Symposium, Dublin, Ireland 2006

Mishra J, Fellous JM, and Sejnowski TJ. A Biophysical Neuronal Model exploring Attention Mechanisms in Visual Cortex. Society for Neuroscience Poster 331.14. San Diego. 2004.

Mishra J, and Bhalla US. Simulations of Inositol Phosphate Metabolism and its Interaction with InsP_3 mediated Calcium Release. Networks and Behavior: International Neurobiology Symposium. National Centre for Biological Sciences, Bangalore, India. 2003 [also Student Graphics Designer for Symposium]

Mishra J, and Bhalla US. Simulations of Inositol Phosphate Metabolism and its Interaction with InsP_3 mediated Calcium Release. International Symposium on Cell & Developmental Biology. National Centre for Biological Sciences, Bangalore, India. 2001

Mishra J Computational model of visual face processing. National Computational Neuroscience Workshop. National Centre for Biological Sciences, Bangalore, India. 2000.

Sahi S, **Mishra J**, and Kothekar V. Enzyme selectivity of new cyclooxygenase-2/5 lipoxygenase inhibitors using molecular modeling approach. Indian Biophysics Society Symposium, New Delhi, India. 1999

COMPUTATIONAL SKILLS

Programming:

MATLAB, UNIX, C, HTML, DOS, Microsoft Macros, Labview

Psychophysics programming:

Presentation (Neurobehavioral Systems), CORTEX

EEG/ Neuroimaging data analysis:

ERPSS, EEGLAB, AFNI

Brain electrical source modeling: BESA, LAURA
STATISTICA

Modeling in Simulators:

NEURON, GENESIS, AMBER

Multimedia expertise:

Adobe Photoshop and Illustrator, Quicktime, ProShow Gold, Audacity

Other:

MS Office

EXPERIMENTAL SKILLS

Electrophysiology:

Human Event Related Potential (ERP) recordings

Optics:

in vivo Intrinsic Signal Imaging, Calcium Imaging, Confocal Microscopy

Molecular/ Cellular Biology:

Cloning and Tissue Culture Techniques

LANGUAGE SKILLS

English, Hindi (fluent)

French (conversant: Diplome de Langue, Alliance Française de Delhi, India. 2000)

Spanish, Urdu, Punjabi, Oriya, Sanskrit (familiar)

LEADERSHIP & VOLUNTEER EXPERIENCE

2008 Full marathoner and top fundraiser for **AID**, San Diego
(sandiego.aidindia.org)

2005-07 **President, UDAI** (www.udai.org)
UDAI is a UCSD graduate student group that collaborates with pioneering non-profit organizations in India to promote awareness about social issues related to health, education & cultural heritage revival.
duties: supervised projects, moderated and presented at colloquia, organized community fundraisers and fair booths, developed websites for affiliated non-profits, site visit to affiliated non-profits in India.

- 2006-07 **Vice President, Local Affairs, Neural Networks Inc.** (www.nninc.org)
NNInc. is a non-profit organization that aims to improve rural access to neurological healthcare in developing countries, with a primary focus on India.
duties: supervised local activities, organized fundraisers and coordinated volunteers, built collaboration with other non-profits to promote awareness, designed NNInc. brochure, edited grant proposals and media presentations.
- 2005 Volunteer and Member, Art of Living Organization, 2005
- 1998-1999 **Joint Secretary, Science Association**, Sri Venkateswara College, Delhi University, India.
- 1999-2000 **Executive Member, Science Association**, Sri Venkateswara College, Delhi University, India. 1999-2000.
- 1999 **Child Counselor, Childline**, New Delhi
Childline is a program for street and working children run by the non-profit organization, Butterflies.

REFERENCES

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Dr. Terrence J. Sejnowski
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