SHIVAM CHAUDHARY

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Cognitive scientist and neural engineer with 5+ years of hands-on research in EEG-based BCI, sensorimotor control, and primate neurophysiology. Experience in real-time systems, prosthetic control pipelines, and behavioral training. Seeking applied R&D roles in neurotechnology and brain-machine interfaces

EDUCATION

MSc Cognitive Science, Indian Institute of Technology (IIT) Gandhinagar (2021 - 2023)
Supervisor: Prof. Krishna Prasad Miyapuram, Brain and Informatics Lab
Dissertation: EEG-based Brain-Computer Interface for Grasp Motion Prediction
Grade: 8.97 / 10.00 (US: 3.81/4)

BSc Information Technology, St. Xavier's College (Autonomous), Mumbai (2017 - 2020)
Relevant Coursework: Programming in C, C++, Python, and Java, Machine Learning, Deep Learning, Website Development, Mobile Application Development, Network Security
Grade: 3.61 / 4.00

RESEARCH AND INDUSTRY EXPERIENCE

Research and Development Engineer 1, University of California Berkeley (Sep 2023 - Present)
Building a novel feedback-dependent dexterous manipulation task for human behavioral and primate electrophysiology studies to understand how the brain implements sensorimotor control during sequences of dexterous movements. Working in a team of three members to build integrated hardware and software in Python, design experiments, and develop neural data analysis pipelines. In addition, I am training naive rhesus macaque monkeys and helping with surgical procedures and animal care. I am also working on analyzing coherence between dorsal premotor and primary somatosensory cortices in macaques to understand dynamics of dexterous control.

MS Cognitive Science, Indian Institute of Technology Gandhinagar (Aug 2021 - Aug 2023)
Masters Dissertation
Conducted research on EEG-based brain-computer interface for hand open vs. close classification, developed algorithms for EEG spectral feature extraction and classification using Python, achieved above-chance within-subject classification performance, and contributed to the development of a pipeline for real-time control of a virtual or 3D-printed prosthetic hand under the guidance of Prof. Krishna Prasad Miyapuram.

Stimulus-Response Correlation between Drum Beats and EEG (May 2022 - Jul 2022)
Collaborated with Prof. Derek Lomas and Prof. Krishna P. Miyapuram to investigate the relationship between electroencephalography (EEG) signals and drumbeats. Created experiment design, collected EEG data, and applied neural data analysis principles to find participant specific neural signatures for individual music pieces. Presented our findings at the 6th Joint International Conference on Data Science & Management of Data (CODS-COMAD' 23).

Independent Project: Cable-driven upper-limb exoskeleton (Aug 2022 - Nov 2022)
Designed and built a cable-driven upper-limb wearable exoskeleton and developed control algorithms under the guidance of Prof. Vineet Vashishta. Integrated mechanical engineering principles with cognitive and brain sciences to create a functional prototype that could assist people with upper limb impairments.

ICOI Webapp, Prodio Designworks Mumbai (Apr 2020 - Sep 2020)
Collaborated with a team of four to design and develop an internal website for the International Congress of Oral Implantologists (ICOI) using ReactJS/Redux for the front end and NodeJS for the back end. Application helped streamline staff activities, including member management, payment scheduling, and credentialing.

Full Stack Developer at Prodio Designworks, Mumbai (Apr 2020 - Sep 2020)
Worked as a MERN (Mongo, Express, React, Node) stack web developer with teams in an agile manner and assisted by cloud services such as Jira, Trello, Bitbucket, and Invision

Bachelor's Dissertation, St. Xavier's College (Autonomous), Mumbai (Oct 2019 - Apr 2020)
Collaborated in a team of two to develop a novel approach to classify human emotions from EEG signals under the guidance of Professor Lydia Fernandes. Employed advanced techniques such as Wavelet Transform, Principal Component Analysis (PCA), and Support Vector Machines (SVM) to achieve significantly above-chance classification performance.

ACHIEVEMENTS

- Secured A+ (11 out of 10) grade in the course "Computational Neuroscience" at IIT Gandhinagar.
- Secured funding of Rs. 1.2L (Rs. 120,000 / 1400 USD) from the IIT Gandhinagar to present a research paper at the **University of Padova, Italy**.

CONFERENCE PRESENTATIONS

Poster *SFN '24* Society for Neuroscience, Chicago, 2024 [PSTR287.20]

Woohyun Kim, **Shivam Chaudhary**, Tomas Oppenheim, and Preeya Khanna; A paradigm to study the role of tactile contact events in learning and execution of object manipulation behavior.

PUBLICATIONS

S. Soni, **S. Chaudhary**, and K. P. Miyapuram, "Enhancing Motor Imagery based Brain Computer Interfaces for Stroke Rehabilitation," in Proceedings of the 7th Joint International Conference on Data Science & Management of Data (11th ACM IKDD CODS and 29th COMAD), 2024.

S. Chaudhary, K. P. Miyapuram, and D. Lomas, "Predicting drum beats from high-density Brain Rhythms," in Proceedings of the 6th Joint International Conference on Data Science & Management of Data (10th ACM IKDD CODS and 28th COMAD) (CODS-COMAD '23), Association for Computing Machinery, New York, NY, USA, 2023, pp. 291-292, https://doi.org/10.1145/3570991.3571029 — PDF.

V. Rohira, **S. Chaudhary**, S. Das, and K. P. Miyapuram, "Automatic Epilepsy Detection from EEG signals," in Proceedings of the 6th Joint International Conference on Data Science & Management of Data (10th ACM IKDD CODS and 28th COMAD) (CODS-COMAD '23), Association for Computing Machinery, New York, NY, USA, 2023, pp. 272-273, https://doi.org/10.1145/3570991.3570995 — PDF.

S. Chaudhary, P. Pandey, K. P. Miyapuram and D. Lomas, "Classifying EEG signals of mind-wandering across different styles of meditation," in Brain Informatics, vol. 4, no. 1, pp. 152-163, Mar. 2022, doi: 10.1007/978-3-031-15037-1_13. Presentation at University of Padova, Italy, July 2022 — PDF

P. Pandey, P. Gupta, **S. Chaudhary**, K. P. Miyapuram and D. Lomas, "Real-time Sensing and Neurofeedback for Practicing Meditation Using Simultaneous EEG and Eye Tracking," 2022 IEEE Region 10 Symposium (TENSYMP), 2022, pp. 1-6, doi: 10.1109/TENSYMP54529.2022.9864414. Poster presentation at IIT Bombay, Mumbai, July 2022 — PDF

S. Singh, P. Pandey, **S. Chaudhary**, K. P. Miyapuram, and J. Lomas, "Towards the Development of Personalized and Generalized Interfaces for Brain Signals across Different Styles of Meditation," in Proceedings of the Thirteenth Indian Conference on Computer Vision, Graphics and Image Processing, Gandhinagar, India, 2022, pp. 54-62, doi: 10.1145/3571600.3571656. – PDF

TEACHING

Lead Teaching Assistant, "Computational Neuroscience", Neuromatch Academy (Jul 2023) Led a team of TAs to facilitate advanced computational neuroscience courses, guiding learners through complex concepts and enhancing educational content.

Teaching Assistant, "Computational Neuroscience," IIT Gandhinagar (Jan 2022 - May 2022) Assisted course instructor in guiding students with projects related to music, meditation, and brain-computer interfaces. Checked assignments, provided guidance on course projects, and conducted presentations. I also took lectures on EEG signal processing and classification, followed by a live demo.

Teaching Assistant, "Computation and Cognition," IIT Gandhinagar (Aug 2022 - Nov 2022) As a TA for Computation and Cognition, I guided students in programming and problem-solving from a cognitive science perspective, connecting theory to real-world applications. I also gave a lecture on analyzing event-related potential (ERP) signals.

Volunteered at Door Step School(NGO), Mumbai (Dec 2017 - Jun 2018)
Taught Social Science, Life Skills, and English to students from backward families. Assisted them in improving their academic performance and developing crucial life skills.

MENTORING

Saher Soni (Masters, IIT Gandhinagar) (Jan 2023 - May 2023)
Decoding motor imagery signals from EEG using LSTM. Manuscript accepted at CODS COMADS 2024.

Smriti Saini (Masters, IIT Gandhinagar) (Jan 2023 - May 2023)
Classifying hand postures (reaching, twisting, grasping) from surface EMG signals.
Current Status: PhD student at MIT Brain and Cognitive Sciences.

Bagmish Sabhapondit (Masters, IIT Gandhinagar) (Jan 2023 - May 2023)
Predicting drum beats from high-density brain rhythms and analyzing stimulus-response correlations in EEG data.

Riddhi Johri (Masters, IIT Gandhinagar) (Jan 2023 - May 2023)
Classifying imagined speech signals from EEG using machine learning and deep learning.
Current Status: Software Engineer at NXP.

Dheemant Jallepalli (Undergraduate, IIT Jodhpur) (Jan 2023 - July 2023)
Distinguishing EEG signals corresponding to winning or losing a gamble after decision-making.
Current Status: MITACS @ UManitoba & MS BioE at Carnegie Mellon University.

ACADEMIC SERVICE

Judge, Neurotech @ Berkeley Hackathon 2025 (March 2024)
Judged in a Neurotechnology Hackathon organized by Neurotech at Berkeley, UC Berkeley student club.

Reviewer, Cognitive Science Society 2025 (March 2025)
Navigated reviewing papers in the age of GenAI and ensured critical feedback helped progress science.

Reviewer, Cognitive Science Society 2024 (March 2024)
Reviewed research papers, providing critical feedback to ensure scientific rigor and clarity.

Lecture on EEG Signal Processing and Classification, IIT Gandhinagar (March 2023)
Invited by Prof. Krishna Prasad Miyapuram to discuss EEG signal processing, followed by a live demo.

Lecture on Event-Related Potentials, IIT Gandhinagar (Nov 2022)
Provided an overview of event-related potentials in EEG signals.

Introduction to Brain-Computer Interfaces, EETI Foundation (Nov 2022)
Gave an online talk on brain-computer interfaces to around 100 participants.

Reviewer, ICONIP 2022 (Aug 2022)
Reviewed research papers, ensuring high-quality submissions for presentation and publication.

LEADERSHIP

Website Lead, G20-Ignite, IIT Gandhinagar (Mar 2023 - Apr 2023)
Led a team to build the website for the G20-sponsored Ignite - A sci-tech fair, collaborating with stakeholders to create an engaging experience for school children.

Website and Application Manager, Technical Council, IIT Gandhinagar (May 2022 - Jul 2023)
Led a team to modernize and improve the student body's technology infrastructure.

BlithchronFest App Team Lead, IIT Gandhinagar (Aug 2021 - Mar 2022)
Led a team to develop a mobile app using React Native, Redux, and Firebase, now live on the Google Play Store.

Organiser-in-Charge, Computers Department, Malhar Fest '19 (Apr 2019 - Aug 2019)
Led a team of 12 to create a website, Android app, and iOS app, and managed production and hardware.

Website Lead, Indian Music Group, St. Xavier's College (Jul 2019 - Aug 2020)
Led a team to create a website for the Indian Music Group used by members worldwide.

SKILLS

Technical Skills	Python, Animal Behavioral Training, ML/DL/RL, PCB Design, Mechatronics, CNC Milling, 3D design, React (web/app), Lab Streaming Layer (LSL), PsychoPy, LaTex
Soft Skills	Problem-solving, leadership, teamwork, adaptability, practical communication skills, research paper writing, presentation
Cloud Platforms	Google Cloud Platform (GCP), Amazon Web Services (AWS), MongoDB
Equipment	VICON Motion Capture, EGI 64 channel EEG system, TMSi EMG system, Tobii Eye-tracker TX300

CERTIFICATIONS

Building Transformer-based NLP Applications by NVIDIA DLI (Oct 2021) — **Certificate**

TensorFlow Developer Professional Certification by deeplearning.ai (May - Jun 2021) — **Certificate**

Deep Learning Specialization by deeplearning.ai (May 2020 - Apr 2021) — **Certificate**

Machine Learning in Octave by deeplearning.ai (Jan 2020 - Mar 2020) — **Certificate**

WORKSHOPS AND SPECIAL COURSE PARTICIPATION

1. **Brain, Computation, and Learning (BCL)** workshop held at the **Indian Institute of Science** (IISC, Bengaluru) in January 2023. I interacted with eminent faculties in the areas of invasive BCI, such as Prof. Rajesh PN Rao.
2. **Computational Neuroscience**, Neuromatch Academy, 2021.
3. The **BCI & NeuroTechnology Spring School**, GTEC, 2021.
4. A 5-day course on **Measurement and Analysis of Human Locomotion** by Dr. Kamiar Aminian, EPFL.
5. A 2-day **Workshop on Redundantly Actuated Robots and Their Human-Centered Application** at IIT Gandhinagar.

REFERENCES

Prof. Preeya Khanna
Assistant Professor, EECS & HWNI
University of California Berkeley, CA
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Prof. Derek Lomas
Assistant Professor, Human Centered Design
Delft University of Technology, Netherlands
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Prof. Krishna Prasad Miyapuram
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