

# Applications Invited for Postdoctoral Position

(Human Computer Interaction + Artificial Intelligence)

**Title of the project:** Enhancing Decision Communication with Hybrid Brain-Computer Interfaces

**Principal Investigator (PI):** Yogesh Kumar Meena

**Discipline:** Computer Science and Engineering

**Project description:** Non-invasive brain-computer interfaces (BCIs) have the potential to create new communication pathways for both healthy and disabled individuals. However, existing BCI systems have not yet achieved sufficient performance for widespread practical use. This challenge may be addressed by a hybrid neural interface combining non-invasive BCIs' strengths with other physiological modalities. These interfaces aim to establish seamless and intuitive communication pathways by integrating signals such as neural (EEG), neuromuscular (EMG), and eye gaze, enabling faster and more accurate decision-making with minimal effort.

At the Human-AI Interaction (HAIX) Lab at IIT Gandhinagar, we emphasise the interdisciplinary approach blending Human-Computer Interaction, Artificial Intelligence, and Neuroscience to 1) deliver intelligent technologies and systems and 2) transform community health and care. This project aims to create a hybrid BCI system that blends motor imagery (MI), steady-state visual evoked potentials (SSVEP), P300 signals, and physiological data to provide adaptable engagement modes tailored to users' needs. The challenge lies in designing a unified interface where command inputs remain consistent across modalities, allowing users to switch seamlessly without cognitive overload. The postdoctoral fellow will develop paradigms, data acquisition methods, and AI algorithms to analyse multimodal data, integrating language models for assistive communication and control. The aim is to enhance real-time interaction systems, improving accuracy and response times while designing intuitive UI/UX for next-gen applications in assistive devices and clinical tools.

**No. of positions:** 1

**Duration:** One year (Funding validity until 13th February 2026)

**Responsibilities:** Research and development, student co-supervision.

**Salary (per month):** Rs. 72,000 - 84,000 per month (consolidated with no other allowances).

**Leaves & Benefits:** As per institute norms.

**Eligibility:** Ph.D. Degree in Computer Science & Engineering, Electrical Engineering, and Cognitive Science, or a related field. Strong background and prior publications in at least one of the following areas preferred: Human Computer Interaction, Brain-Computer Interfaces, Biomedical signal processing (Gaze, EMG, ECG/EKG), and AI/ML).

Applicants should submit the following documents in a **single PDF** through the [this](#) link:

1. One page research proposal.
2. Detailed Curriculum Vitae.
3. Copy of three best publications.
4. Contact information (preferably email id) of three referees.

**Last date for applying:** January 31, 2025.

For more details, please contact the PI: <https://labs.iitgn.ac.in/haix/>