
JOIN OUR TEAM

R.01: Intern — Multimodal Data & Signal Processing

Research · Guwahati · Hybrid · Full-time

Function	Location	Commitment	Compensation
Research, Data & Signal Processing	Guwahati (Hybrid)	Full-time	Stipend + up to 30% incentive

ABOUT THE ROLE

QELP AI is developing a multimodal neurocognitive AI platform for understanding human cognitive and performance states from heterogeneous data.

We are looking for a Junior Research Fellow to work at the data and signal-processing layer of this system. You will work with multimodal recordings, biosignals and behavioural data, developing the computational pipelines required to clean, synchronize, segment, characterize and evaluate data before it is used for computational modelling.

This is a hands-on research role. You will be expected to investigate data, identify problems, test processing approaches, document methodological decisions and produce reproducible outputs.

WHAT SUCCESS LOOKS LIKE

By the end of the initial engagement, another researcher should be able to take the documented raw data, run the pipeline, reproduce the processed dataset and understand how every major processing and analytical decision was made.

WHAT WE OFFER

- Compensation: Competitive stipend for the engagement.
- Performance incentive: Up to 30% of the stipend, based on performance and achievement of defined deliverables.

- Employment opportunity: High-performing candidates may be considered for formal employment with QELP AI, with compensation aligned to the role, relevant experience and grade.
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— **ROLE OBJECTIVE**

Develop reliable and reproducible pipelines for converting raw multimodal recordings, biosignals and behavioural data into analysis-ready datasets and validated features for neurocognitive model development and evaluation.

— **WHAT YOU WILL WORK ON**

- Process heterogeneous time-series, biosignal and behavioural data.
 - Develop preprocessing pipelines for noisy and heterogeneous datasets.
 - Synchronize data from multiple sensing modalities.
 - Detect and document missing, corrupted and low-quality data.
 - Perform filtering, segmentation and feature extraction.
 - Develop data-quality and preprocessing checks.
 - Create reproducible dataset versions and evaluation splits.
 - Establish statistical and machine-learning baselines.
 - Investigate unexpected patterns, artefacts and failures in the data.
 - Evaluate the effect of preprocessing decisions on downstream analysis.
 - Work with neuroscience and AI researchers to translate research requirements into computational pipelines.
 - Maintain clear documentation of datasets, processing decisions, experiments and results.
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— **ESSENTIAL QUALIFICATIONS**

Academic Background

B.E./B.Tech., M.E./M.Tech., or M.Sc. in one of the following or a closely related discipline:

- Computer Science
- Electronics / Electrical Engineering
- Biomedical Engineering
- Data Science
- Signal Processing
- Computational Neuroscience
- Applied Mathematics
- Statistics

Candidates must meet the applicable eligibility requirements of the appointing institution.

Experience

Prior research, project or professional experience involving time-series data, signal processing, machine learning or computational experimentation is preferred.

— ESSENTIAL PRACTICAL SKILLS

- Strong Python programming.
- Practical experience with NumPy, pandas, SciPy and scikit-learn.
- Understanding of: digital signal processing, filtering, sampling, segmentation, feature extraction, statistical analysis.
- Experience working with real-world or noisy time-series data.
- Ability to inspect data and determine whether a processing pipeline is producing valid results.
- Ability to visualize and interpret signals before applying computational methods.
- Familiarity with Git and reproducible, modular code.
- Ability to clearly document methods, assumptions and processing decisions.

Minimum Evidence of Competence

Candidates should be able to demonstrate at least one substantive project involving signal processing, time-series analysis, machine learning or multimodal data.

Candidates should be prepared to walk through their data, methodology, code and reasoning during the interview.

— DESIRABLE SKILLS

Experience with one or more of:

- Biosignal processing
- Physiological or behavioural time-series analysis
- Multimodal data synchronization
- Missing-data and artefact handling
- Sensor data processing
- Experimental data analysis
- Statistical feature extraction
- PyTorch or TensorFlow
- MNE-Python or comparable scientific signal-processing frameworks

Candidates do not need experience across all data modalities. Depth in one area and strong fundamentals in signal processing are valuable.

— THREE-MONTH RESEARCH DELIVERABLES

01 Dataset Audit

A structured audit of available recordings, metadata, data quality, missingness and recording consistency.

02 Data Dictionary

A documented schema describing available data streams, variables, sampling characteristics, metadata and data-quality criteria.

03 Processing Pipeline

A reproducible preprocessing and feature-extraction pipeline for selected data streams.

04 Synchronization & Quality Control

Defined procedures for temporal alignment, artefact handling, missing-data treatment and quality assessment across relevant data streams.

05 Evaluation Framework

Documented dataset splits, preprocessing assumptions, evaluation procedures and baseline methodologies.

06 Baseline Results

Initial statistical and/or machine-learning baselines establishing a reference point for subsequent model development.

07 Research Documentation & Audit Trail

A complete, version-controlled record of data provenance, processing methods, analytical decisions, experiments, deviations, results and interpretation, sufficient to enable independent assessment of reproducibility, data quality, methodological integrity and the basis of subsequent inferences.

VALIDATED BY

Meghali Deka

APPROVED BY

Dr. Doli Hazarika