Dr. HAMED GHANE

Research Scientist (Neurotech) | Real-Time ML on Biosignals (EEG/EMG/ECG)

Glasgow/London, UK
hmd.ghane.s@gmail.com | linkedin.com/in/hamedghane | github.com/HamedGhaneS

SUMMARY

Research scientist with a control engineering foundation and strong mathematical modelling, focused on neural interfaces over the past three years. I build time-series ML for EEG/EMG/ECG—event detection, segmentation, and continuous decoding—and run closed-loop human studies with causal, low-latency inference in Python/LSL. I turn experiments into reusable tools, integrating stimulus, acquisition, and online analysis.

CORE TECHNICAL SKILLS

- Time-series ML: classification/regression, event detection, segmentation, temporal/sequence models; causal / streaming inference
- Biosignal processing (EEG/EMG/ECG): filtering, artefact handling, feature extraction (band power, envelope), source separation
- Real-time stacks: LSL integration, low-latency profiling, buffered & async I/O, online calibration/feedback
- Experiment design & stats: human-in-the-loop studies / psychophysics; GLM & mixed models; permutation tests/bootstrapping; reproducible analysis
- Software & tools: Python (PyTorch, scikit-learn, NumPy/SciPy, pandas), MATLAB; Git
- Control & modelling: linear & nonlinear control, observers, system modelling/identification, HIL/SIL validation, real-time implementation

PROFESSIONAL EXPERIENCE

Research Associate - University of Glasgow **Apr 2024 - Present . Glasgow**

- Built and maintained a modular closed-loop BCI stack (stimulus → acquisition → online inference) in Python + LSL for EEG/EMG/ECG.
- Latency engineering: profiled I/O, buffering, model runtime; verified with SIL/HIL; reduced end-to-end delay; published internal benchmarks.
- Projects:
  - Multimodal real-time BCI platform: architecture + deployment.
  - Latency optimisation: measurement + reduction via SIL/HIL.
  - Two studies: EMG-based decision-dynamics; ECG-based feedback-timing for learning./
  - Audio-neural interface (earbud) to enhance memory (recall rate): pipeline + funding applications.
  - HMI; neurotech ethics and law: paradigms + proposals.
- Implemented signal processing (artefact handling, band-limited features) and time-series ML (event detection, segmentation/decoding) with PyTorch / scikit-learn / NumPy / SciPy.
- Shipped reusable LSL utilities & analysis modules with READMEs; supported lab reproducibility.

Postgraduate Researcher - Center for Brain and Cognition, UPF **2022 - 2024 . Barcelona**

- Prototyped a real-time, ML-based EEG BCI that detected motor intention and adapted outcome timing to probe sense of agency; used causal time-series models with fully reproducible analysis.

Visiting Researcher - University of Groningen **2017 - 2018 . Groningen**

- Applied nonlinear (chaotic) dynamical system analysis to system modelling and control; collaborative projects with applied maths groups; co-authored publications.

Assistant Professor - Islamic Azad University **2014 - 2022 . Iran**

- Teaching and research in control and systems; supervised MSc theses; led applied projects in BCI, robotics, system modelling/identification, and closed-loop control algorithms

EDUCATION

MSc, Brain and Cognition **2022 - 2023 . UPF/ Spain**

- EEG-based intention detection for sensorimotor control & sense of agency; real-time BCI (Python/LSL).

PhD, Control Engineering **2009 - 2013 . AUT/ Iran**

- Complex system modelling, chaotic time-series analysis, and algorithmic control theory