

ASEEM P SUBEDI

ALBANY, NY, USA

SUBEDA@RPI.EDU | ASEEMPS@OUTLOOK.COM | [LINKEDIN.COM/IN/AXIOM5](https://www.linkedin.com/in/axiom5) | [GITHUB.COM/AXIOM5](https://github.com/axiom5) | [M5AX.IO](https://m5ax.io)

SUMMARY

PhD-level Machine Learning Scientist with 5+ years of experience developing end-to-end deep learning frameworks for complex time-series and physiological signal analysis. Proven ability to architect novel CNN and Transformer models that deliver real-time, interpretable, and scalable solutions from raw sensor data. Passionate about translating multimodal biosignals into discernable insights for MedTech and human performance applications.

TECHNICAL SKILLS

- **Languages & Frameworks:** Python (TensorFlow, PyTorch, JAX, Scikit-learn, MNE), MATLAB, SQL, R, Git
- **ML Architectures:** Transformers, CNNs (1D-CNN, WaveNet), RNNs/LSTMs, Autoencoders, Foundation Models
- **ML Concepts:** End-to-End Learning, Self-Supervised Learning, Time-Series Analysis, Explainable AI (XAI), Attention Mechanisms, Few-Shot Learning, Sensor Fusion
- **Domain Knowledge:** Biosignal Processing (fNIRS, EEG, ECG), Brain-Computer Interfaces (BCI), Clinical Study Design, Human Motor Skill Assessment

RESEARCH EXPERIENCE

CeMSIM, RPI, Troy, NY

Sep 2025 – Present

Postdoctoral Researcher

- Pioneering multimodal learning by integrating auxiliary physiological signals (HRV, pupillometry) with neuroimaging data to build a comprehensive model of human performance.
- Expanding the model's core function from binary classification to regression, enabling the prediction of precise, quantitative scores for surgical certification (FLS).
- Developing advanced modeling techniques for high-bitrate time-series data, focusing on adapting Transformer architectures for complex EEG signal analysis.

CeMSIM, RPI, Troy, NY

Jan 2020 – Aug 2025

Graduate Researcher, AI/ML (Health)

- **Architected and validated a novel 1D-CNN framework** that achieved **98.6% accuracy** in classifying motor skills from raw fNIRS data, enabling real-time analysis.
- **Designed and implemented a Transformer-based foundation model** with novel attention mechanisms, providing spatiotemporal explanations that transformed a "black box" model into an interpretable diagnostic tool.

- **Demonstrated state-of-the-art generalization**, adapting the foundation model to a novel medical task with **>87% accuracy using fewer than 30 labeled samples**, proving the model's scalability.
- **Owned the end-to-end creation of a foundational 2,100+ trial neuroimaging dataset**, managing curation and processing of 100GB+ of data to enable training a first-of-its-kind foundation model.

PROFESSIONAL EXPERIENCE

GRIT Engineering Pvt. Ltd., Kathmandu, Nepal May 2018 – Sep 2023

R&D Co-Director & Co-Founder

- Co-founded an engineering firm, leading a cross-functional team of 5+ engineers and technicians from concept to delivery of custom electromechanical systems.
- **Directed the full project lifecycle** for a high-visibility automated camera system for "The Voice Nepal," managing client requirements, system integration, and successful on-time deployment.
- Owned the R&D roadmap, driving iterative product improvements through rigorous design testing and root cause analysis, directly impacting system reliability and client satisfaction.

EDUCATION

Rensselaer Polytechnic Institute, Troy, NY Aug 2025

Ph.D. in Mechanical Engineering

- Dissertation: "*End-to-end bimanual motor skill assessment from raw neuroimaging data*"

Rensselaer Polytechnic Institute, Troy, NY May 2024

M.Eng. in Mechanical Engineering

SELECT PUBLICATIONS

- **A. Subedi** et al. "An Interpretable Transformer-Based Foundation Model for Cross-Procedural Skill Assessment...", *arXiv:2506.22476*, 2025.
- **A. Subedi** et al. "End-to-End Deep Learning for Real-Time Neuroimaging-Based Assessment of Bimanual Motor Skills", *npj Digital Medicine (Under Review)*, *arXiv:2504.03681*, 2025.
- C. Eastmond, **A. Subedi**, S. De, X. Intes, "Deep Learning in fNIRS: A Review", *Neurophotonics* 9(4).

PROFESSIONAL ACTIVITIES & AWARDS

- **Peer Reviewer** for scientific journals including *Neurophotonics* and *Heliyon*.
- **Teaching Assistant** for Numerical Methods & Machine Dynamics (RPI, 2020).
- ABU Robocon (Asia-Pacific Robot Contest): Team Nepal (**Best Engineering Awards: 2015, 2016**).
- IOE Entrance Scholarship: Full-tuition, merit-based award.