ASEEM P SUBEDI

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SUMMARY

PhD candidate with expertise in **machine learning** research for BCI (fNIRS, EEG), physiological signals (ECG, pupillometry) and behavior (EMG, eye-tracking). Proficient in statistical and AI models for time-series analysis. Specializing in novel ML methods for **health sensing**, **neuromotor interfaces** and **quantitative analysis**.

EDUCATION

Ph.D., Rensselaer Polytechnic Institute, Troy, NY — Sep 2025

Mechanical Engineering | GPA: 3.58/4.0

- **Thesis:** "Bimanual Motor Skill Assessment Using Raw Neuroimaging, Explainable AI, and Multimodal Integration"

M.Eng., Rensselaer Polytechnic Institute, Troy, NY — May 2024

Mechanical Engineering | GPA: 3.69/4.0

- **Project:** "A Dilated Causal Convolutional Model for Surgical Skill Assessment Using Optical Neuroimaging"

TECHNICAL SKILLS

- **ML & Modeling:** CNNs, Transformers, WaveNet, Autoencoders, Adversarial methods, Ensemble learning
- **Programming/Script:** Python (Tensorflow, Pytorch, JAX, MLX), C, Matlab, R
- **Tools & libraries:** SciPy, Sckit-learn, Pandas, AWS, Homer3, EEGlab, MNE, SPSS
- **Advanced Methods:** Numerical Optimization, System Identification, Information Theory
- **Engineering & Design:** SolidWorks, AutoCAD, ANSYS (Fluent, ICEM-CFD), XFLR5

RESEARCH EXPERIENCE

CeMSIM, RPI, Troy, NY — Jan 2020 – Present

Neuroimaging & ML for Human Factors

- Developed AI models for classifying surgical skill performance and exploring effects of stress
- Created data pipelines to denoise and compile large-scale fNIRS/physiological datasets
- Utilized novel **BERT-inspired methods** to fuse hemodynamic, pupillary, and EEG signals for neuromotor analysis

- Provided data-driven insights on IRB protocols, device feasibility, and sensor usage, ensuring ethical and efficient data collection.

SELECT PUBLICATIONS

- **A. Subedi** et. al *"End-to-End Deep Learning for Real-Time Neuroimaging-Based Assessment of Bimanual Motor skills", npj (Nature) Digital medicine* (Under peer review).
- C. Eastmond, **A. Subedi**, S. De, X. Intes, *"Deep Learning in fNIRS: A Review", Neurophotonics 9(4)*.
- **A. Subedi**, et al., *"A Dilated Causal Convolutional Model for Surgical Skill Assessment ...", Clin. Transl. Neurophotonics, 11945*.
- FNU Rahul, A. Dutta, **A. Subedi**, et al., *"A Deep Learning Model for a priori estimation ...", Brain Stimulation*.

TEACHING / INDUSTRY EXPERIENCE

School of Engineering (RPI), Troy, NY — Jan 2020 – May 2020

Teaching Assistant

- Mentored 200+ students for graduate (Machine Dynamics) and undergraduate (Numerical Methods) level courses

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

R&D Co-Director

- Led machinery designs for TV franchises, HDPE recycling systems, and fabrication projects.
- Supervised intern teams in CAD modeling (dumbwaiters, food expeller systems, river ferries)

Paaila Technology, Lalitpur, Nepal — Dec 2017 – May 2018

Robotics Intern

Assisted in designing and fabricating mobility/articulation mechanisms for a commercial robotic waiter.

VOLUNTEERING & ACHIEVEMENTS

- **Robotics Competitions:** Represented Nepal at ABU Robocon, winning consecutive team awards in 2015 and 2016
- **Social Initiatives:** Organized alumni-funded winter supply distribution to 9 villages. Hands-on deployment of 100+ post-earthquake relief housing in 14 remote locations of Nepal, 2015.
- **IOE Entrance Scholarship:** Full-tuition, merit-based award