Apala Pramanik

Lincoln, Nebraska , USA

+1 4023048871 | apramanik2@huskers.unl.edu | github.com/apalapramanik | linkedin.com/in/apala-pramanik

Personal Profile

A highly motivated PhD student at the School of Computing, University of Nebraska Lincoln. I am focused on millimeter wave communication improvement strategies using machine learning, with a strong foundation in Robotic Cyber-Physical Systems and formal verification methods. *I'm interested in full-time internship opportunities to start in the summer of 2026 in the field of machine learning in wireless communications with applications in V2I/V2X.*

Education

University of Nebraska-Lincoln- PhD *Nebraska , USA*

Graduate Research Assistant - School of Computing *June 2024 - Current*

Advised by: Dr. Mehmet Can Vuran, Dale M. Jensen Chair Professor

University of Nebraska-Lincoln- Master's *Nebraska , USA*

Graduate Research Assistant - School of Computing *Aug 2021 - May 2024*

Advised by: Dr.Dung Hoang Tran, Assistant Professor

Guru Gobind Singh Indraprastha University- Bachelor's *Delhi, India*

Electronics and Communication *Aug 2017 - May 2021*

Thesis: Deep learning techniques for Magnetic Resonance Image (MRI) denoising and reconstruction from undersampled MRI scans.

Research Experience

University Of Nebraska-Lincoln *Nebraska, USA*

Doctor of Philosophy, Computer Science *Aug 2024 - Current*

- Conducting research on **millimeter-wave (mmWave) communication systems** for next-generation wireless networks, focusing on beamforming, signal processing, and transmit power control with real hardware testbeds.
- Experience with ray-tracing software such as **Wireless InSite**.
- Mentoring undergraduate researchers on experimental design and data analysis.
- Showcasing research and engineering concepts to K–12 students through outreach events.
- **Technical Skills:** GNU Radio, USRP, Python, C++, Ubuntu Linux, Git.

University Of Nebraska-Lincoln *Nebraska, USA*

Master's, Computer Science *Aug 2021 - December 2024*

- Perception-based Runtime Monitoring and Verification for Human-Robot Construction Systems
- Experience with **Neural Network Verification (NNV)** software for formal analysis of deep learning models.
- Knowledge of **Signal Temporal Logic (STL)** for specifying and verifying temporal properties in cyber-physical systems.
- **Technical Skills:** ROS, Gazebo, RVIZ, HTML, CSS, Python, C++, Ubuntu Linux, Git.

Publications

Conference Proceedings

Perception-based Runtime Monitoring and Verification for Human-Robot Construction Systems
Apala Pramanik, Sung Woo Choi, Yuntao Li, Luan Viet Nguyen, Kyungki Kim, Hoang-Dung Tran
2024 22nd ACM-IEEE International Symposium on Formal Methods and Models for System Design (MEMOCODE), 2024

ASTITVA: assistive special tools and technologies for inclusion of visually challenged
Apala Pramanik, Rahul Johari, Nitesh Kumar Gaurav, Sapna Chaudhary, Rohan Tripathi
2021 international conference on computing, communication, and intelligent systems (ICCCIS), 2021

START: Smart Stick based on TLC Algorithm in IoT Network for Visually Challenged Persons
Rahul Johari, Nitesh Kumar Gaurav, Sapna Chaudhary, Apala Pramanik
2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC), 2020

Workshops

PerM: Tool for Perception-based Runtime Monitoring for Human-Construction Robot Systems
Accepted at DAC 2024 WIP Workshop
Apala Pramanik, Kyungki Kim, Dung Hoang Tran

Vision-based Runtime Monitoring for Human-Construction Robot Systems
IROS 2023 Workshop : Formal methods techniques in robotics systems: Design and control
Apala Pramanik, Kyungki Kim, Dung Hoang Tran

University Projects

Spanish News Classification *Nebraska , USA*

University of Nebraska Lincoln *Aug 2021 - July 2024*

- Experimented with several models, including GRU, LSTM and BETO model, we were able to predict our dataset's labels with a 91.80% accuracy using the BETO model and Tokenizer
- Explored data augmentation techniques such as synonym replacement and character replacement for generating a larger dataset for training leading to 99% training accuracy.
- **Technical Skills:** Python with Pandas, matplotlib, Seaborn, Tensorflow, Deep Learning Models
- **Soft Skills:** Presentation skills, Leadership, Teamwork, Logical Thinking.

Deep Learning Projects *Nebraska , USA*

University of Nebraska Lincoln *Aug 2021 - July 2024*

- Classifying Fashion MNIST + CIFAR-100
- Sentiment Analysis with Sequential Models
- **Technical Skills:** Python with Pandas, matplotlib, Seaborn, Tensorflow, Deep Learning Models
- **Soft Skills:** Report writing, Logical Thinking, Critical Thinking.

Markov Model of the Voynich Manuscript *Nebraska , USA*

University of Nebraska Lincoln *Aug 2021 - July 2024*

- Developed a Markov model for the Voynich Manuscript, a handwritten book, carbon-dated to the early 15th century, that is written in an unknown script.
- Generated Transition Probabilities amongst various initial and final characters of the script
- Analyzed and compared the script against other similar scriptures
- **Technical Skills:** Python with Pandas, matplotlib, Seaborn.
- **Soft Skills:** Report writing, Logical Thinking, Presentation skills

Brain MRI Denoising *Delhi, India*

Guru Gobind Singh Indraprastha University *Aug 2017 - May 2021*

- Implementing a UNET-based deep-learning (DL) network for denoising MRI images and comparing it against the state-of-the-art denoising methods

Skills

Programming	**Python**: Pandas, PyTorch, Tensorflow, NumPy, Scikit-learn, etc. **ROS**: rospy, roscpp **Softwares**:GNURadio, Wireless Insite, Matlab, Gazebo, Rviz, Arduino, AVR Studio, Proteus Professional, KEIL **Point Cloud Library**
Miscellaneous	Linux, Shell (Bash/Zsh), LaTeX(Overleaf/R Markdown), Microsoft Office, Git.
Soft Skills	Mentoring, Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Interests

Dancing	I have a senior diploma degree in Bharatnatyam (Indian Classical Dance) and have training of more than 10 years.
Fitness	I am passionate about weight training and maintaining a healthy and active lifestyle.
Technical Writing	I enjoy writing research papers to convey my research work in easy and understandable language.
Languages	English, Hindi, Bengali

References available upon request.