

Apala Pramanik

Lincoln, Nebraska, USA

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Personal Profile

A highly motivated graduate student at the School of Computing, University of Nebraska Lincoln. Focused on the dynamic field of robotics, with a strong foundation in Robotic Cyber-Physical Systems, formal specification, and deep learning. Committed to leveraging cutting-edge technologies to drive innovation and advance the field of robotics.

Education

University of Nebraska-Lincoln

Nebraska, USA

Graduate Research Assistant - School of Computing

Aug 2021 - Current

- Working as a Graduate Research Assistant
- Mentored Undergrad Researchers in Summer
- Semester GPA: 4.0
- Courses:** Design and Analysis of Algorithms, Automata, Computation and Formal Languages, Operating System Principles, Multi-Access Edge Computing, Introduction to Deep Learning, Deep Learning and Assured Autonomy Analysis, Software Engineering for Robotics, Computational Linguistics (GRADES: A/A+)

Guru Gobind Singh Indraprastha University

Delhi, India

BTech in Electronics and Communication

Aug 2017 - May 2021

- Thesis Title: Deep learning techniques for Magnetic Resonance Image (MRI) denoising and reconstruction from undersampled MRI scans.
- CGPA: 7.7/10

Delhi Public School, RK Puram

Delhi, India

High School

Apr 2015 - Apr 2017

- Passed with Distinction: 93% in CBSE Boards
- Specialised in Physics, Chemistry, and Maths with Economics

Research Experience

University Of Nebraska-Lincoln

Nebraska, USA

Graduate Research Assistant

Aug 2021 - Current

- Lead the development of a model that utilized YOLO as a foundation to detect humans at a construction site.
- Localized the human's position and predicted the motion using the point cloud library and Kalman filter.
- Automated the motion of the robot while avoiding collision with humans.
- Calculated robustness of the system for Signal Temporal Logic specifications.
- Technical Skills:** ROS, Gazebo, RVIZ, HTML, CSS, python, C++, Ubuntu Linux, Git.
- Soft Skills:** Time Management, Communication, Presentation skills.

Skills

Programming

Python: Pandas, PyTorch, Tensorflow, NumPy, Scikit-learn etc. **ROS:** rospy, roscpp **Softwares:** Gazebo, Rviz, Matlab, 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.

University Projects

Vision-based Runtime Monitoring for Human-Construction Robot Systems

Nebraska, USA

University of Nebraska Lincoln

Aug 2021 - Current

- Localising human workers at a construction site in robot's local view and predicting their motion
- Using the predictions to monitor the safety of the cyber-physical system by ensuring that the robots avoid collision with humans while navigating.
- Calculating system robustness for the required safety specifications using Signal Temporal Logic
- Test the algorithm for a specific case study
- Technical Skills:** ROS, Gazebo, RVIZ, Signal Temporal Logic, Point Cloud Library, Overleaf, LaTeX.
- Soft Skills:** Report writing, Presentation skills, Time Management, Teamwork.

Spanish News Classification

Nebraska , USA

University of Nebraska Lincoln

Aug 2021 - Current

- 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 - Current

- 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 - Current

- 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

Publications

CONFERENCE PROCEEDINGS

PerM: Tool for Perception-based Runtime Monitoring for Human-Construction Robot Systems
DAC 2024 Work-In-Progress 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

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

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.
- Baking** I love baking cakes and cupcakes.
- Linux** Since 2017, I have been in love with Linux.

Technical Writing I enjoy writing research papers to convey my research work in easy and understandable language.

Languages

- English** Professional proficiency
- Hindi** Native proficiency
- Bengali** Mother Tongue

References available upon request.