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, STL, LTL, 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

University of Nebraska Lincoln

Nebraska , USA

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

University of Nebraska Lincoln

Nebraska , USA

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

University of Nebraska Lincoln

Nebraska , USA

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

Guru Gobind Singh Indraprastha University

Delhi, India

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

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.