Pratham Kohli

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Result-driven graduate with 4+ years of work exp. seeking full-time roles (May '24) in Robotics & AI

EDUCATION

Arizona State University, *MS in Robotics and Autonomous Systems* | Arizona, USA   GPA: 4.0 / 4.0   May 2024
Indian Institute of Technology Patna, *B.Tech in Mechanical Engineering* | Bihar, India   GPA: 10 / 10   Aug 2022

Tech Finalists: International Robotic Competition (eYRC) & Bachelor's Capstone Project in Mechanical Department
Conferences: IEEE, American Control Conference ACC'24 | Indian Institute of Science, I-4AM'22 | Delivered 2 talks
Courses: Linear Algebra | Sequential Decision Making | RL | ML | UAVs | Perception | Optimization | Controls | PDE

EXPERIENCE

Brainchip, *Solutions Architect Intern (Robotics & RL Specialist)* | Remote (California, USA)   May 2023 - Aug 2023
- Implemented 3D models and ROS-joints controlled through Q-Learning, RL model operated on AKD1000 Chip.
- Accelerated development by 40%, delivered a fully functional AI-controlled robot from scratch.
- Engineered the swift transition of neural network designs from TF to BrainChip's MetaTF framework.

Indian Institute of Technology Bombay, *Robotic Software Engineer Intern* | Remote (India)   May 2020 - Aug 2020
- Led an 8-person team to develop a fiducial-marker-based **localization** model for an unstable camera feed.
- Optimized the localization model using V-rep for real-time camera feeds, achieved a calibration error of $\leq 0.5\%$.
- Orchestrated design, combined rule-based script and unit tested to validate auto-evaluators with 95% coverage

e-Yantra, *Robotic Engineer (Co-Founder and Team Lead)* | India   Aug 2019 - July 2020
- Coordinated a 4-member team to National Finalist Status (Top 0.3%), built a multi-tasking robot from scratch.
- Optimized **pathfinding**(A* & Dijkstra) algo. & actions, reduced execution time by 22%, enabled faster navigation.
- Integrated IR, proximity sensors for perception & encoder motors, Servos for autonomous actions | Used **CNC**.

ABU Robocon 2020, *Robotic Engineer (Team Member)* | India   Jan 2019 - Feb 2020
- Directed team efforts, achieved top 15 (national) in ABU Robocon Stage 1 through innovative robot design.
- Engineered a 3-wheeled omni-drive system, achieved precise movement in any direction for the Pass Robot.
- Modelled throwing hand compliance with pneumatics parameters using the Catapult mechanism and deployed.

SKILLS

Languages	Python, C/C++, C#, embedded C, Java, Catkin, CUDA, CMake, Matlab, Git, Bash, LaTeX, Vim, PCL, I2C
Robotics	ROS 1/2, V-Rep, Gazebo, Ansys, MoveIt, MuJoCo, FEA, CFD, Arduino, AtMega 2560, Sensor Fusion, PLC
Software	Linux, Tensorflow, Pytorch, Docker, OpenCV, ZeroMQ, B0RemoteAPI, CorelDraw, Solidworks, Fusion360
Certifications	Robotics Software Engineer, Udacity Nanodegree – (2023)	Self-Driving Cars, University of Toronto – (2023)

PROJECTS

Home-Delivery Bot | Robotics Software Engineer, *Udacity Nanodegree* (Scholarship Scholar)   Dec 2022 - April 2023
- Developed a robot in Gazebo (**ROS**) & integrated with **feedback control** for state dynamics.
- Implemented SLAM and sensor fusion (Rotary Encoder, Odom & IMU) for navigation & deployed AMCL.

IEEE Paper – *Control Systems Society Conference* (Paper Accepted)   Jan 2023 - Jan 2024
- Distributed RHC approach for multi-agent systems with privacy and maintained MTL specifications.
- Utilized Kalman filter equations and **MILP** to encode MTL specifications as constraints.

Visual Tracking UAV - *Mambo Drone*   Jan 2023 - April 2023
- Developed a high-performance, **low-level flight control** algorithm with an integrated **Kalman Filter** for an Drone.
- Championed an optimized red color detection algorithm, slashed processing time by 30%, and improved efficiency.

Meta's Research Enhancement – *Object Goal Navigation*   Jan 2023 - April 2023
- Integrated **YOLOv7** and performance enhancements led to a 7% success rate boost in object goal navigation.
- Engaged with a deep RL model, leveraged On Policy. Integrated **RRT** to path planning replaced Fast Marching.

Dc-GANs (Deep Convolutional Generative Adversarial Network) – *Fashion MNIST*   Nov 2022 - Dec 2022
- Devised a DcGAN architecture & successfully trained within 50 epochs to generate of realistic synthetic images.
- Attained an impressive DcGAN loss rate of 0.014 for the generator model.

Robotic Arm – *Singularity Analysis*   Nov 2022 - Dec 2022
- Utilized Applied Inverse Kinematics to analyze a 6-DoF robotic arm, achieved a 99.9% singularity avoidance.
- Implemented **Trajectory Planner** for a Kinova Gen3 robotic arm, optimized the trajectory within the Space.