

ABHISH KHANAL

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OBJECTIVE

Applied Research Engineer with 2+ years of experience in Embedded systems, Robotics, Control System, Estimation, Motion Planning, Multi-agent Systems, seeking internship for summer 2023.

EXPERIENCE

Graduate Research Assistant
George Mason University

Jun 2022 - present
Fairfax, VA, USA

- Research on point goal navigation of multiple robots using learning in a partially mapped environments (POMDPs).
- Ongoing research on multiple robot navigation with limited communication in hostile, unknown environments.

Graduate Teaching Assistant
George Mason University

Aug 2021 - Aug 2022
Fairfax, VA, USA

- Teaching assistant for Intro to low level programming (CS 262), and Computer Graphics (CS 551)

Research Engineer
Prokura Innovations

Feb 2020 - Apr 2021
Lalitpur, Nepal

- Worked on developing UAVs to supply medicines in rural parts of Nepal.
- Analysis of LOS conditions from Digital Elevation Model (DEM) data for UAV Communication and worked on BV-LOS Communication for UAV using XBee mesh network.
- Development of payload drop flight mode in Ardupilot flight stack to precisely drop payload [in windy conditions].
- Simulation, analysis and development of A-tail, V-tail, Quadplane, tiltrotors VTOL and multicopters.

Embedded Software Engineer
National Innovation Center Nepal

Nov 2019 - Feb 2020
Kirtipur, Nepal

- Made [Baby Warmer \(Nyano Nani\)](#) that prevents neonatal hypothermia working under guidance of Dr. Mahabir Pun. Contribution mostly on design and development of overall electronic circuitry and embedded software for thermal control system, user interface, and logical operation of the device.
- Worked on fabrication of wings, fuselages, and tails for fixed wing planes and VTOL; Worked on airborne of design using open source flight stack.

EDUCATION

Doctorate in Computer Science, George Mason University, Fairfax, VA, USA

Aug 2021 - Current

Relevant Coursework: Analysis of Algorithms, Advance Artificial Intelligence, Data Mining, Software Testing, Robotics Motion Planning, Research Methodologies in CS.

Research Interest: Multi-agent systems, POMDPs, Motion-planning, Estimation, Machine Learning.

Bachelor in Electronics and Communication Engineering, Pulchowk Campus, Nepal

Nov 2015 - Sep 2019

Highlights: Actively participated in international robotics competition, Team leader for Nepal in [ABU Robocon 2018](#), Organized national level robotics competition and several workshops related to robotics.

PUBLICATIONS

Khanal, A., Chand, D., Chaudhary, P.B., Timilsina, S., Panday, S.P., Shakya, A., & Pandey, R.K. (2020). [Search Disaster Victims using Sound Source Localization](#). ISCRAM.

SKILLS

Languages : Python, C, C++, C#, Matlab & Simulink, Java, HTML & CSS

Technical Skills: Git, Unity, Data visualization, Machine Learning, Robot Operating System (ROS), Robotics (Estimation, Control, Motion Planning), Software Testing, Ardupilot, PX4, PCB Design (Ki-CAD), Graphic Design.

Soft Skills: Team work, Project management

PROJECTS

Baby Warmer (Nyano Nani) Nyano Nani is a low cost baby warmer built targeting remote parts of Nepal where Neonatal mortality rate is high. As of today, health centers in over 23 districts of Nepal use Nyano Nani. Companies has been distributing Nyano nani as their CSR Initiative. (Nyano Nani was awarded [People's Choice Award](#) in North East Ohio Medical University, USA)

Last Mile Delivery We developed low-cost drones (fixed-wing and multicopters) for medical delivery in Nepal (Max Range of 20 KM) with ground control stations and software to control and monitor multiple UAVS for health post and hospitals. This project was funded by [UNICEF Innovation](#).

Sound Source Localization An omnidirectional unmanned ground vehicle system that sends data to a controller station while simultaneously recording the azimuth and elevation of incoming sound sources using the Generalized Cross Correlation Phase Transform (GCC-PHAT) for sound source localization, N-LMS filter, and CNN-based auto encoder for denoising. This project was advised by Dr. Sanjeeb Pd. Pandey and funded by University Grant Commission (UGC) during my undergraduate study.

MAVLINK UAV API This is a simple Python API developed to control UAVs that uses MAVLINK message as it's communication protocol.

RRT* for Vehicle dynamics This project modifies the existing RRT and RRT* algorithm to generate a trajectory that a vehicle with dynamical constraint (Dubin's car model) can follow.

ACHIEVEMENTS

Best Engineering Award, Panasonic Award These awards were provided for robust performance of badminton playing robot presented in ABU Robocon 2016, Thailand ([more](#)).

Best Shuttlecock Award This award was provided for the best design of shuttlecock coordination and picking mechanism in manual and automatic robot presented in ABU Robocon 2018, Vietnam ([more](#)).

ROHM award This award was provided by ROHM semiconductors for the unique design and operation of four legged automatic robot in ABU Robocon 2019, Mongolia.

Best Poster Presentation This award was provided by the department of computer engineering for the best poster presentation of our final year project in engineering.

Best Instrumentation Project This award was provided for our project 'IOT Based Home automation' under category Instrumentation in National Technological Exhibition (LOCUS) held in Nepal.