Khush Agrawal

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EDUCATION

VNIT, NAGPUR
| 2017 - Present
B.Tech in Electronics and Communication Engineering
CGPA: 8.95/10

COURSEWORK

MACHINE LEARNING

Machine Learning
Neural Networks and Deep Learning
Improving Deep Neural Networks
Convolutional Neural Networks
CS 234 - Stanford
Reinforcement Learning - UCL

ELECTRONICS

Digital Logic Design
Analog Circuit Design
Microcontrollers and Interfacing

STAT/MATH

Numerical Methods and Probability Theory
Integral Transforms and Partial Differential Equations
Calculus in Multiple Variable

SKILLS

GENERIC

•Programming •Linux •Deep Learning
•Reinforcement Learning

ELECTRONICS

•ATmega8 •ATmega328 •Intel 8085

LIBRARIES

•PyTorch •OpenCV •Git •numpy
•OpenAi-gym •Robot Operating System

SOFTWARES

•MATLAB •SolidWorks •AVR-studio
•Multisim •EAGLE

ACHIEVEMENTS

TECHNICAL

•First Prize Technoseason-17
| Across 3 categories
•Second Prize AXIS-18
| Project Presentation
•Prize AXIS-17
| Innovative Design

PROJECTS

STAIR ALIGNMENT USING BEHAVIOURAL CLONING [LINK]

| IvLabs, VNIT, Nagpur [Apr. 2019 - May 2019]

•Proposed a novel pipeline for autonomous stair-climbing robot using deep learning.
•Created an end-to-end two-stage machine-learning-based pipeline for staircase alignment of a differential drive robot.
•Cascaded Segmentation Network (UNet) and Behaviour Cloning Network (ResNet-34) for achieving the task.

PERSON FOLLOWING ROBOT [LINK]

| IvLabs, VNIT, Nagpur [Jul. 2019 - Aug. 2019]

•Developed Deep Learning based algorithm to follow a person in a dynamic environment, which has applications in human-robot interaction industry.
•Multiplexed Detection and Tracking algorithm to obtain algorithms more robust to occlusion and with a lower computation time (compared to detection algorithm working alone).

EXPERIENCE TRANSFER IN REINFORCEMENT LEARNING [LINK]

| IvLabs, VNIT, Nagpur [Jun. 2019 - PRESENT]

•Project aims to transfer experience of a teacher agent(receiving higher and lower dimensional observations) to train student-agent(receiving higher-dimensional observations).

POSE ESTIMATION OF A DIFFERENTIAL DRIVE ROBOT [LINK]

| IvLabs, VNIT, Nagpur [May 2018 - Jun. 2018]

•Designed algorithm for pose (rectangular coordinates, angle) estimation of a robot in a two dimensional plane using odometry, and developed the hardware for robot.
•Used ROS framework to establish communication between the nodes.

PUBLICATIONS

•Navid Panchi, Khush Agrawal, et al: "Deep Learning-Based Stair Segmentation and Behavioral Cloning for Autonomous Stair Climbing", International Journal of Semantic Computing Vol. 13, No. 4 (2019) 1–16

•(forthcoming) Khush Agrawal, Rohit Lal, 2019: "Person Following Mobile Robot using Multiplexed Detection and Tracking", International Conference on Advances in Mechanical Engineering, ICAME-2020.

EXTRACURRICULAR

CHAIRMAN, IVLABS, VNIT, NAGPUR

| robotics research lab [Jul. 2019 - Ongoing]

I lead the committee responsible for management of the robotics club.

VOLUNTEER

| IEEE VNIT Chapter, VNIT-Nagpur [Jul. 2017 - Ongoing]

Organized Basic Electronics, Circuit and PCB Designing and Micro-Controllers workshops..

DELEGATE

| Youth Exchange Program, Russia [Jul. 2019]

Represented India in a 8 day long delegation program in Russia.