

Rahul Kumar

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EDUCATION

IIT KHARAGPUR

BS IN COMPUTER SCIENCE

2016 - Till Date

CGPA: 9.16 / 10.0

DAV KAPILDEV

Grad. May 2016 | Ranchi, India

Grade : 95.4%

LINKS

Github:// [vernwalrahul](#)

LinkedIn:// [vernwalrahul](#)

Medium:// [@rahulvernwal](#)

COURSEWORK

Programming and Data Structures

Algorithms

Software Engineering

Database Management System

Compilers + Operating Systems

Artificial Intelligence (AI)

Machine Learning

Reinforcement Learning

Information Retrieval

Image Processing

SKILLS

Languages

• C • C++ • Python • SQL • Java

• Matlab • \LaTeX

Libraries and Tools:

• Tensorflow • OpenCV • ROS

• OMPL • Docker • Flask

RESPONSIBILITIES

Instructor / Mentor

- MIT-IIT Robotics Workshop
- IEEE Robotics Winter Workshop
- Kharagpur Winter of Code 2017

Executive Head

- Code Club, IIT Kharagpur
- Kharagpur Open Source Society

EXPERIENCE

AMAZON ROBOTICS | SOFTWARE ENGINEER - ROBOTICS INTERN

May 2019 - July 2019 | Seattle, USA

- Built end-to-end stack for hands free automation of box picking using UR10 (6DoF Robotic Arm).
- Designed perception module to identify boxes from time of flight image.
- Integrated controller, motion planning and calibration modules.
- Deployed entire stack to AWS code pipeline.

PERSONAL ROBOTICS LAB | UNIVERSITY OF WASHINGTON

Research Intern

Advisor: Prof. Siddhartha Srinivasa

May 2018 - July 2018 | Seattle, USA

Topic : Learning Sampling Methods for constrained space motion planning

- Devised non uniform sampling strategies to bias sampling in bottleneck regions.
- Devised algorithms to increase robustness of the generated graph.
- Our algorithm outperformed state of the art method on a wide range of problems | Accepted at IROS '19

Working Areas - Deep Learning, AutoEncoders, Constrained Space Problems

PROJECTS

KHARAGPUR ROBO-SOCCER RESEARCH LAB

AI Team Member

Advisor : Prof. Jayanta Mukhopadhyay

Jan 2017 - Present | IIT Kharagpur

Objective : To build autonomous soccer playing robots

- Integrated path planning and Finite State Machines (FSM) architecture for Robocup Small Size League.
- Designed a simulator for robots using PyQT.
- Worked on kalman filter to tackle noisy data from camera images.

Research Areas - Multi-agent systems, motion planning, noise filters, robot soccer

DIGITAL LEGAL ASSISTANT

OPEN SOFT 2019, GENERAL CHAMPIONSHIPS, IIT KHARAGPUR

- Developed the stack to search for related cases and acts for a given natural language query.
- Used page ranking algorithms on citation graphs to determine the ordering of results and cases on over 50000 supreme court cases.

AWARDS

2019	Final Round Worldwide	Game of Drones NIPS'19 with Microsoft
2019	Final Round National	Smart India Hackathon
2018	3rd in National	IBM Blockchain Hackathon
2017	Worldwide	RoboCup SSL First Indian Team
2016	All India Rank 9th	KVPY Fellowship
2016	top 0.03% (AIR 266)	JEE Advanced

OTHER PROJECTS

LEARNING A ROBUST WALK ENGINE FOR NAO ROBOTS

JUL'19 - APR'20

ADVISOR : PROF. JAYANTA MUKHOPADHYAY

One of the major challenge in RoboCup Humanoid League is to enhance the speed and robustness of Nao walk engine. Together with my advisor, I worked to build a walk engine for Nao Robots through Reinforcement Learning.

We evaluated various different algorithms like evolution strategies, PPO, DDPG, and Soft Actor Critic Method.

Working Areas: **Reinforcement Learning, Evolution Strategies, Imitation Learning.**

ACTION/EVENT RECOGNITION FOR SAFETY ANALYTICS

DEC'17 - FEB'18

ADVISOR : PROF. PABITRA MITRA

Recognising actions in video clips by extending CNN in the time domain. The model developed to be most suited for an industrial setting like detecting accidents in a factory.

Working Areas: **Computer Vision, ConvNets, Encoder Decoder Models**

QUESTION GENERATION FROM RDF GRAPH VIA DISCRIMINATIVE RANKING

AUG'18 - NOV'18

ADVISOR : PROF. PLABAN BHOWMICK

Developed an application to automatically generate Q/A pairs from RDF graphs. It involves identification of popular entities, extraction of their relation with other entities using hop distance. Extracted tokens are then fed to transformations and ranking algorithm to produce a ranked list of questions.

Working Areas / Libraries: Knowledge Graph, Ranking Algorithm, SPARQL

MEDICAL OCR

JAN'18 - MAR'18

Worked in a team of 6 to build an OCR for detecting of medical professionals from prescriptions. Integrated Peter Norvig's spelling corrector algorithm to auto-correct misspelled words.

Working Areas: Computer Vision, Character Recognition, Spelling Correction

RRT SIMULATOR

REPOSITORY: RRTSIMULATOR

Developed an interactive GUI interface to simulate a path generated by RRTs avoiding obstacles using Python and Qt. Added Features for low level skill testing of individual robots. Tools and Libraries: OMPL, PyQt, ROS.

BLOCKCHAIN CERTIFICATES

An application on digital certificates using blockchain technology to avoid fraud certificates and speed up the verification process.

Won 3rd prize at National Level Hackathon.

TECHNICAL BLOGS

- Creating Your Messenger Bot with Python
- How Should I Start with CNN
- An Introduction to Variational Auto-Encoder

21k views

2.5k views

1.1k views