Ashish Kumar Gaurav

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Education

- **Indian Institute of Technology, Kharagpur, India** *Jul. 2016 – Apr. 2021*
  Integrated Master of Science in Mathematics and Computing **CGPA: 8.98/10.00**
- **Sree Ayyappa Public School, Bokaro, India** *2013 - 2015*
  All India Senior School Certificate Examination **Aggregate: 94.8%**

Publications

- **Potential and Sampling based RRT star for Real-Time Motion Planning accounting for momentum in cost function** *Dec. 2018*
  25th International Conference on Neural Information Processing (ICONIP 2018), Siem Reap, Cambodia
  (Accepted, to be presented in December)

Projects

- **Demultiplexing Activities of Daily Living** *Jul. 2018 – Present*
  Guide: Prof. Pawan Goyal
  - Working on finding proper activity segments of sensor events from streaming sensor data in a multi-resident smart home.
  - Applied various types of time dependent and sensor dependent clustering methods.

  Research Areas: Unsupervised Learning, Association rule learning, Activity Detection.

- **Kharagpur RoboSoccer Students' Group, Artificial Intelligence team member**
  Guide: Prof. Jayanta Mukhopadhyay *Feb. 2017 – Present*
  - Implemented codes to make autonomous soccer playing **Robcup SSL** bots.
  - Composed various skills, tactics and plays in a STP architecture on ROS (Robot Operating System) for intelligent game play.
  - Implemented variations of RRT in path planning.
  - Implemented Fuzzy Logic based multi agent passing.
  - Currently working on a learning based play selection and evaluation system.

  Research Areas: Multi-agent robot system, Path planning algorithms, Machine Learning.

- **Prediction of Accident Severity of a Region** *Jan. 2018 – Apr. 2018*
  Guide: Prof. Sudhir Kumar Barai
  - Made a prediction model in keras using various factors like road conditions, weather and light conditions, time, day of week and few other factors.
  - Made a Flask app, which marks regions of a city based on accident severity.

  Research Areas: Multi layer perceptron, Deep neural network, Imbalanced dataset.

- **Google Summer of Code (under Sympy)** *May. 2018 – Aug. 2018*
  Guide: Mr. Francesco Bonazzi
  - Sympy is a python library for symbolic mathematics.
  - Implementation of rule based indefinite integration.
  - Implementation of a large set of mathematical utility functions in python.

  https://summerofcode.withgoogle.com/projects/4753861571510272

Achievements

- Part of the first team from India ("KgpKubs") to qualify and participate in RoboCup Small Size League, Japan 2017, a six versus six robot soccer competition. *Jul. 2017*
- Part of the team ("KgpKubs") to win Silver Medal in the Goalie Challenge of 3D Simulation League in RoboCup 2018, Canada *Jun. 2018*

Experience

- **Code-O-Soccer** *Jan. 2018*
  - Organized a national level Artificial Intelligence strategy coding event,held at Kshitij, 2018.
- **Kharagpur Open Source Society** *Feb. 2017 - Mar. 2018*
  - Conducted various workshops like Git, GitHub, python and Linux workshop for getting started with open source software development.
  - Mentored the Kharagpur Winter of Code 2017 programme.
- **IEEE Robotics Winter Workshop** *Dec. 2017*
  - Conducted a week-long workshop for first and second year undergraduates at IIT Kharagpur and taught Image Processing methods using OpenCV and C++.

Skills

- **Machine Learning, Deep Learning, Path Planning, Robotics, Computer Vision**
  - **Languages:** C, C++, Java, Python
  - **Libraries, packages and frameworks:** TensorFlow, Keras, OpenCV, Git, OMPL, ROS, Wolfram Mathematica

Relevant Courses

- **Academic Courses:** Data Structures, Analysis of Algorithms, Soft Computing Tools, Object Oriented Systems, Probability and Statistics, Linear Algebra.
- **Online Courses:** Machine Learning Course (Stanford) on Coursera, Neural Networks and Deep Learning on Coursera, Convolutional Neural Networks on Coursera.