G Rahul Kranti Kiran

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EDUCATION

Indian Institute of Technology Kharagpur
B.Tech in Computer Science and Engineering; GPA: 9.12/10 *July 2016 - August 2020(Exptd.)*

PUBLICATION

Off-Road Lane Detection Using Superpixel Clustering And RANSAC Curve Fitting
International Conference on Control, Automation, Robotics and Vision 2018.
Design and Implementation of Autonomous Ground Vehicle for constrained environments
International Conference on Robotic Computing 2019.

INTERNSHIPS

Viper Verification Infrastructure ETH Zrich
Research Intern *May 2019 - July 2019*

- Worked on the development of the Viper verification infrastructure's intermediate verification language.
- Realised plugin support for the grammar of the Viper language by modifying the existing grammar.
- Designed a datatype verifier and, the plugin for the verification of flows in graph-based computations.
- Rewrote the grammar rules to remove ambiguity and generalise the syntax of permission-based constructs.
- Designed plugins using the implemented system, including a plugin for the proof of termination of functions.

RESEARCH WORK/PROJECTS

Autonomous Ground Vehicle IIT Kharagpur
Software and Systems Head *March 2017 - December 2018*

- Designed a real-time path planning algorithm using Hybrid-A* algorithm for non-holonomic drive.
- Realized the velocity profile and localization based feedback mechanism for the Hybrid A* planner.
- Created architecture for guiding ROS Move-Base using GPS coordinates transformed to robot frame.
- Developed IPC framework for Eklvaya 6.0 robot for robust command delivery from navigation-stack.

Scalable Edge Analytics IIT Kharagpur
Bachelor's Thesis *March 2019 - Present*

- Developing a network management software based on the ALOE Orchestration Framework.
- Developed RYU based Heavy Hitter detection app that uses REST API to detect substantial data flows.
- Using the Bottle web framework for controlling a Mininet based SDN prototype to simulate the data flow in an actual topology.

Parser for OpenModeliCa IIT Kharagpur
Under Prof. Soumyajit Dey *Dec 2018 - March 2019*

- Designed and XML syntax for representation of micro-grids designed with OpenModeliCa Editor
- Implemented server-client interfaces to interpret manual design into Modelica code.

Tiny C Compiler IIT Kharagpur
Compilers Term Project *August 2018 - November 2018*

- Designed the lexical analyser, parser and, implemented the machine-dependent code generator for a reduced C language. **Code**.

KGP-RISC IIT Kharagpur
Computer Architecture Course Project *August 2018 - November 2018*

- Created a prototype for a RISC CPU using Verilog, with its own Instruction Set Architecture. **Code**.

Scholastic Achievements

- Secured All India Rank 261 among 200,000 students from all over India in the **IIT** entrance examination.

- Secured All India Rank 108 from over a 10,000 students from all over India in the exam conducted to award the **Kishore Vaigyanik Protsahan Yojna**.

Research Interests

Compilers, Programming Languages, Computer Networks, Software Defined Networking, Computer Architecture, Software Engineering

Competitions

- **Intelligent Ground Vehicle Competition**   Oakland University, Rochester, USA
  Team Captain   *June 2018*
  - Represented IIT Kharagpur and secured 2nd **position** in the AutoNav challenge at the 26th IGVC.
  - Built an autonomous bot to follow lane markings and GPS coordinates while avoiding obstacles.

- **Inter IIT**   IIT Bombay
  Team Vice-Captain   *December 2018*
  - Secured 1st **position** in the TV Audience Measurement event at the 7th **Inter IIT Tech Meet**.
  - Designed an innovative approach for collecting household-level television viewership data for each channel.

- **Hardware Modelling - Autonomous Lawn Mower**   IIT Kharagpur
  Software Team Member   *April 2018*
  - Motion planning head of the **Silver Winning** Inter Hall Hardware Modelling team.
  - Designed and implemented an algorithm for target generation of the Autonomous Lawn Mower using Random Sampling and BFS.

- **DRDO Robotics And Unmanned Systems Exposition (DRUSE)**   DRDO
  Motion Planning Team Head   *March 2018*
  - Qualified for the Zonal Round of DRUSE by standing among the top 30(/1000) applicants in the East.
  - Designed architecture of a Swarm of Robots to create a 3D map of a building to assist soldiers during terrorist attack scenarios.

Coursework Information

- **Ongoing**: Advances in Operating System Design,Parallel Algorithms,Theory of Computation,Artificial Intelligence

- **Completed**: Operating Systems,Principles of Programming Languages,Computer Networks,Computer Architecture and Organization,Compilers,Algorithms,Formal Languages,Automata Theory,Software Engineering

Extra Curricular Activities

- **IEEE Winter Workshop**   IIT Kharagpur
  Mentor   *December 2017*
  - Mentored the IEEE certified Robotix Winter Workshop conducted by Technology Robotics Society, attended by over 50 students.

Skills

- **Technologies**: Linux, Docker, Mercurial, Ryu, MiniNet, FastParse, Bottle, Git, Numpy, ROS, Gazebo

- **Languages**: C/C++, Scala, Java, Python, Haskell, Lisp, SML, Lua