Vaibhav Agarwal

Computer Science and Engineering – IIT Kharagpur

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Educational Qualifications

Bachelor of Technology : Indian Institute of Technology Kharagpur - *CGPA: 8.6/10.0*   *July'14-Present*

Senior Secondary - CBSE : Mahatma Hansraj Modern School, Jhansi - *Overall percentage: 95.4%*   *2014*

Secondary - ICSE : Christ the King College, Jhansi - *Overall percentage: 94%*   *2012*

Interests

Algorithms and Graph Theory   Data Analytics   Networks   Artificial Intelligence

Projects

Positioning System using Bipartite Matching and Voronoi Diagrams   *May'2016-July'2016*
Indian Institute of Technology Kharagpur, under Prof. Jayanta Mukhopadhyay
- Created a positioning module for humanoid robots using computational geometry concepts of Voronoi Cells and Delaunay Triangulations.
- Created a role matching module which uses maximum bipartite matching (Hungarian Algorithm) to allot the generated positions to suitable bots dynamically.
- Integrated successfully. Increased the time efficiency of the code by 30% of the previous implementation, using constant memory.
- The team (including me) participated in 3D Simulation League at RoboCup 2016, Germany.

Path Planning module for differential drive robots   *May'2015-July'2015*
Indian Institute of Technology Kharagpur, under Prof. Jayanta Mukhopadhyay
- Created a path planner for differential drive soccer playing robots using Dynamic Window Algorithm.
- Obtained successful results, decreasing the slip parameter to less than 1%.
- The implementation was successfully integrated and the team won the Bronze medal for IIT Kharagpur at FIRA 2015, South Korea.

Data extraction from a 2-D plot *OpenSoft competition, IIT Kharagpur*   *Feb'2016-Mar'2016*
- Created a module to extract graph information from a plot and create the corresponding data table using OpenCV libraries and Tesseract.
- The implementation was successful in more than 80% of the cases, including dashed lines and discontinued plots. The extraction module was also used to extract out the legend box from the plot.

Line follower robot *Robotics workshop at IIT Kharagpur*   *Dec'2014*
- Attended a workshop organised by IEEE and Technology Robotix Society, IIT Kharagpur aimed to create an autonomous line follower robot.
- Worked on techniques to build the robot and subsequently, coded the algorithm using DFS traversal to cover the entire grid of lines, using Atmel Studio.

Back-end development of Online Game *Kharagpur Game Theory Society*   *Jan'16-Mar'16*
- Contributed to the development of an online game for a flagship contest of KGTS, IIT Kharagpur.
- Created modules in php using CodeIgniter framework.
- The game witnessed a participation of over 1000 participants from IIT Kharagpur, Delhi University and IIM Rohtak in a 2-day event.

Online sales portal *Software Project, Prof. Partha Pratim Das, IIT Kharagpur*   *Mar'2016*
- Created a software in Java which allows users to buy and sell items to different users.
- The user can perform administrative roles on his profile and history log, as well as interact with other users through messaging.
- Awarded with an "Exceptional" grade in the project work.

Achievements and Scholarships

- All India Rank **217** in Joint Entrance Exam (JEE) Advanced 2014 among 150,000 candidates. *2014*
- All India Percentile **99.99** in Joint Entrance Exam (JEE) Mains 2014 among 1.5 million candidates. *2014*
- ACM ICPC Asia Amritapuri Regional Finalist. *2015*
- Member of Bronze winning team at Federation of International Robosoccer Association 2015, South Korea. *2015*
- Represented IIT Kharagpur in RoboCup 2016 held in Leipzig, Germany. *2016*
- Kishore Vigyanik Protsahan Yojana (KVPY) Scholar, Dept of Science and Technology, Govt of India. *2013*
- National Talent Search (NTSE) Scholarship awardee, by NCERT, Govt of India. *2010*
- National top 300 in National Standard Examination in Physics and Chemistry. *2013-14*
- Aditya Birla Group Scholarship shortlist, amongst top 32 IIT freshmen. *2014*
- Goralal Syngal Scholarship at IIT Kharagpur for outstanding academic achievements. *2014-15*

Work and Volunteer Experience

- **Algorithmic Game Theory Society, Head** *IIT Kharagpur* *Jan'16-Present*
  - Organise and deliver classes to freshers and sophomores interested in algorithmic game theory.
  - Provided questions and game design to the parent team of Kharagpur Game Theory Society, for its flagship contests Nashify 2015 and 2016; Both events saw the participation of over 200 participants from IIT Kharagpur.

- **Image Processing Workshop, Mentor** *Organised by IEEE and Texas Instruments* *Dec'2015*
  - Mentored a batch of more than 50 freshers in the image processing workshop.
  - Taught the freshmen basic image processing algorithms and techniques.

- **Secretary** *Code Club, IIT Kharagpur* *July'14-Present*
  - Problem setter and tester at CodeNites, the fortnightly programming contest in IIT Kharagpur.
  - Conducted algorithms and data structures class for freshers. Over 100 students attended the 15-day class.
  - Organised Bitwise 2016, which saw the participation of over 1000 participants from across the globe.

- **Case Study Team, Sub Head** *Meghnad Saha Hall, IIT Kharagpur* *Jan'16-Present*
  - Participated in the inter-hall Case Study competition 2016 and won the First prize.
  - Suggested a present scenario and future directives to tackle the problem statement using SWOT analysis.

Technical Skills

Programming Languages	C/C++, Java, Python, C#, PHP, x86 Assembly
Operating Systems	Ubuntu, Microsoft Windows
Utilities	Git, GDB, Shell, LaTeX, Docker

Relevant Courses

Algorithms 1	Algorithms 2 *	Graph Theory *
Software Engineering	Automata Theory	Compilers *
Computer Organization *	Discrete Structures	Data Structures
Switching Circuits and Logic Design	Probability and Statistics	*denotes ongoing courses*

Miscellaneous

- Got sponsorship to attend RoboCup 2016 Symposium at Leipzig, Germany from IIT Kharagpur.
- Occasional contributor to Open Source and self projects on Github `https://github.com/VaibhavAgarwalVA`.
- Vice Captain of the Maths Olympiad team of MS Hall. Winner of Open IIT Maths Olympiad 2015 and Freshers Maths Olympiad 2014 organised by Technology Students' Gymkhana, IIT Kharagpur.
- Likes to read, observe and innovate.