Kartikeya Gupta

Computer Science and Engineering
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Academic Details

Year	Degree	Institute	CGPA/Percentage
2013-2017 (Expected)	B.Tech in Computer Science and Engineering	Indian Institute of Technology Delhi	9.77/10 **Institute Rank 1**
2013	Class XII, CBSE	Upras Vidyalaya, New Delhi	93%
2011	Class X, CBSE	Delhi Public School R.K. Puram, New Delhi	10/10

Scholastic Achievements

- **Institute Rank 1** Consistently maintaining institute rank 1 among 850 students during academic years 2013-2015 at IIT Delhi. IIT Delhi granted scholarship for the same.
- **All India Rank 4** in Indian Institute Of Technology Joint Entrance Examination (JEE Advanced-2013).
- One of the 16 students selected nationwide for the **Aditya Birla Group Scholarship**, 2013 out of the students from different IITs.
- Certificate of Merit awarded by Homi Bhabha Center for Science Education for being in **Top 30** at:
  - Indian National Chemistry Olympiad 2013 (**INChO**)
  - Indian National Astronomy Olympiad 2012 (**INAO**).
- **NTSE Scholar:** Selected as a National Talent Search Examination Scholar - 2009 for being in top 1000 at National Level.

Major Projects

3D Reconstruction on Mobile Device Prof. Subhashis Banerjee
Summer Undergraduate Research Project *January, 2015 - Present*

- Building a mobile app for near real time 3D reconstruction of monuments/objects.
- Uses accelerometer, gyroscope, magnetometer (IMU sensors) data for rotation and translation matrix estimation.
- Using a Kalman filter, dense and sparse optical flow to improve the extrinsic camera parameters.
- Designed a 2-point algorithm to reduce computational complexity.
- The challenge is to complete dense 3D reconstruction in near real time on mobile devices.

Real Time Position Estimation on Mobile Devices Prof. Subhashis Banerjee
Independent Project *January, 2015 - May, 2015*

- Developed an Android app to calculate displacement and orientation accurately from accelerometer, gyroscope, magnetometer (IMU sensors).
- Applied sensor fusions algorithms to remove static bias and noise.
- Increased robustness and accuracy using local regression and visual tracking of points.
- Created a novel technique to separate regions of motion and rest for enhanced accuracy.
- Optimized algorithm to run in real time.

Other Projects

Network Based Multiplayer Game Prof. Huzur Saran, March, 2015- April, 2015

Designed a multi-player p2p network based game of space invaders where one has to shoot down aliens in the given set of lives using OpenGL for graphics and UDP sockets as network component. To maintain seamless continuity of the game during network outages, a player losing connection is replaced by an Artificial Intelligence bot.

RISC Processor Implementation Prof. Smruti Sarangi, April, 2015 - May, 2015

Designed a RISC processor with RAM, Register File, ALU and Control in Logisim and ran successful simulations of the design. It involved pipelining and forwarding between different stages.

Cloud Storage System Prof. Huzur Saran, February 2015

Created a cloud storage system in C++ allowing users to sync files with the server and share files with each other. Used FTP and TCP-IP for sync and transfer. Implemented data de-duplication to minimise server disk usage. OpenSSL was used to ensure encrypted file transfer.

Prolog Interpreter Prof. Sanjiva Prasad, March 2015

Designed and implemented a Prolog interpreter in SML. Implemented Lexer and Parser using ML-Lex and ML-Yacc to generate an Abstract Syntax Tree.

Relevant Courses

- **Computer Science:**
  Data Structures and Algorithms, Discrete Mathematical Structures, Digital Logic and Design, Programming Languages, Computer Architecture, Design Practices in Computer Science, Logic for Computer Science*, Computer Networks*, Artificial Intelligence*, Analysis and Design of Algorithms*
- **Mathematics and Electrical Engineering:**
  Calculus, Linear Algebra and Differential Equations, Introduction to Electrical Engineering, Probability and Stochastic Processes, Signals and Systems

**Courses Currently pursuing*

Technical Skills

- **Programming Languages:** C, C#, C++, Objective-C, Swift, Java, Python, SML, OCaml, Lex, Yacc, Prolog, VHDL, MySQL, JavaScript

Extra Curricular Activities

- Runner up in Code.Fun.Do - 2015 organised by Microsoft amongst students from different colleges from India.
- Pursued an internship to work in the emergency child line service at Synergy Sansthan, an NGO in rural Madhya Pradesh in December 2013. It involved rescuing children in distress and providing them shelter, counseling and proper care.
- Junior diploma in Indian Classical Music - Tabla from Prayag Sangeet Samiti, Allahabad.