# Mayank Kumar

Rice University
ECE Department, MS-380
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**Objective**

To be a leader in technology which touches human lives

**Education**

PhD student, Electrical Engineering, Rice University — 2014 - Present
*Advised by Dr. Ashutosh Sabharwal*

MS in Electrical Engineering, Rice University — Aug, 2014
*GPA* 4.04/4.00

B.Tech in Electrical Engineering, IIT, Delhi — May, 2010
*GPA* 8.96/10.00*, Department Rank 3*

**Scholastic Achievements**

Texas Instrument distinguished graduate fellow (2012-Present)
Audience Choice Award in the RICE 90 second Thesis Competition 2014
Best Graduate Student Poster, RICE ECE Affiliates Day 2014
NASA Space Health Challenge 2014 (2nd Prize)
Best B.Tech Project Award in IIT Delhi, 2010
Yahoo HackU Award, 2009 by Yahoo R&D
Indian National Physics Olympiad, 2006

**Graduate Research**

**MS Thesis** Robust estimations of Photoplethysmograms using a camera — Fall 2013, Spring 2014

- Developed new algorithm (distancePPG) for monitoring vital sign (pulse rate, pulse rate variability, breathing rate) using a person's video
- Improved performance of current known method to make it work for all skin tones, under varied lighting conditions and in natural motion scenarios

**Publications and Patent**

[J1] Mayank Kumar, Ashok Veeraraghavan, and Ashutosh Sabharwal, "DistancePPG: Robust non-contact vital signs monitoring using a camera," Biomed. Opt. Express 6, 1565-1588 (2015)

[C1] Peter Washington, Mayank Kumar, Anant Tibrewal, and Ashutosh Sabharwal, 'ScaleMed: A Methodology for Iterative mHealth Clinical Trials' IEEE Healthcom 2015 - SSH 2015.

[C2] M. Chowdhary, CSR Technology, USA; M. Sharma, A. Kumar, IIT, India; S. Dayal, CSR Technology, India; M. Kumar, IIT, India. Robust Attitude Estimation for Indoor Pedestrian Navigation using MEMS Sensors. ION GNSS 2012

[C3] Dhruv Jain, Himanshu Gupta, Deeksha Gautam, Mayank Kumar, Vinay Ribeiro, Manish Sharma. Whitespace Network for Vehicular Communication. COMSNETS 2013

[P1] A robust non-contact vital sign monitoring algorithm (2014 US Provisional).

[P2] A system and apparatus for Auditory Evoked Potential (AEP) data acquisition for hearing screening (2011 India Patent)

**Experience**

**Innovator-in-Residence,** Gauss Surgical Inc., Los Altos, CA. Summer 2015
- Explored the prospect of productizing non-contact vital sign monitoring, developed minimum viable prototype.

**Teaching Assistant,** Rice University, ECE Dept. Fall 2014
- Conduct weekly concept review sessions for ELEC-241, Fundamental of Electric Engineering

**Corporate R&D Intern,** Qualcomm, San Diego, CA Summer 2013
- Developed new algorithm for non-linear interference cancellation (NLIC) in 4G communication systems.
- Proposed and implemented new ideas to reduce convergence time and implementation cost of developed algorithm

**Algorithm Developer,** Stanford India Bio-design, AIIMS New Delhi Fall 2011
- Devised novel algorithm for detecting weak (100 nV) Auditory Brainstem Response (ABR) signal in presence of 30 dB high EM noise
- Patented the algorithm (and prototype) (India Patent)

**Algorithm developer,** CSR plc, Noida, Spring 2011
- Developed error model using Extended Kalman filter (EKF) for a mobile phone based pedestrian navigation system
- Benchmarked performance of navigation algorithm and suggested scope of improvements

**Engineering Trainee,** Texas Instruments, Bangalore Summer 2009
- Developed an application to measure performance of GPS receivers during field trials in absence of ground truth data

**Leadership Experience**

**Co-founder,** Yantrr Electronic Systems (YES) Pvt. Ltd. 2010-2015
- Developed the cloud architecture for Yantrr M2M device cloud
- Shaped the strategy for YES to be a leader in Industrial machine-to-machine communications

**Technical Skills**

**Programming Language**: Python, C/C++, MATLAB, VHDL
**Software Libraries**: OpenCV (Computer Vision), Scikit Learn (Machine Learning), Theano (deep-learning), OpeGL (Computer Graphics)
**Hardware Platform**: Arduino, BeagleBone, C5515 TI DSP, DM365 DaVinci, Xilinx Virtex IV