

Mayank Kumar

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- Objective** To be a leader in technology which touches human lives
- Education** PhD candidate, Electrical and Computer Engineering, Rice University 2015 - Present
Advised by Dr. Ashutosh Sabharwal
MS in Electrical and Computer 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** NSF Awards for young professionals contributing to smart and connected health (2016)
Hershel M. Rich Invention Award for developing CameraVitals (2017)
Texas Instruments Graduate Student Fellowship (2015-Present)
Audience Choice Award, Rice 90 Second Thesis Competition 2014
Best Graduate Student Poster, Rice ECE Affiliates Day 2014, 2017
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
- PhD Research** PulseCam: High resolution and motion robust blood perfusion imaging using a camera and a pulse oximeter Fall 2015 -Present
- Developed a new patent-pending algorithm that fuses measurements from a video camera and a pulse oximeter to reliably estimate blood perfusion maps.
 - Developed a unique approach to compensate motion during blood perfusion imaging which significantly improve accuracy.
 - Demonstrate, for the first time, the feasibility of using PulseCam to reliably detect arterial and venous occlusion.
- Publications** [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] Mayank Kumar, James Suliburk, Ashok Veeraraghavan and Ashutosh Sabharwal, "PulseCam: High-resolution blood perfusion imaging using a camera and a pulse oximeter," 2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, 2016, pp. 3904-3909.
- [C2] Peter Washington, Mayank Kumar, Anant Tibrewal, and Ashutosh Sabharwal, 'ScaleMed: A Methodology for Iterative mHealth Clinical Trials' IEEE Healthcom 2015 - SSH 2015.
- [C3] 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

Patents [P1] Camera-based photoplethysmogram estimation (US Utility Patent, Nov 2015)

[P2] High resolution blood perfusion imaging using a camera and a pulse oximeter (US Utility Patent Application, May 2017)

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

Teaching Assistant, Rice University, ECE Dept. Fall 2014
Conducted weekly concept review sessions for ELEC-241: Fundamentals 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.

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 electromagnetic noise.

Algorithm Developer, CSR plc, Noida, Spring 2011
Developed error model using Extended Kalman filter (EKF) for a mobile phone based pedestrian navigation system.

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

Leadership Experience **Co-founder**, Yantr Electronic Systems (YES) Pvt. Ltd. 2010-2015
Developed the cloud architecture for Yantr M2M device cloud and shaped Yantr's strategy to become a leader in Industrial M2M and IoT space.

Technical Skills **Programming Language**: Python, MATLAB, C/C++, VHDL
Development Libraries: OpenCV (Computer Vision), Scikit Learn (Machine Learning), TensorFlow and Keras (deep-learning)

References* Dr. Ashutosh Sabharwal (Prof. Rice, ECE), Dr. Ashok Veeraraghavan (Asst. Prof. Rice, ECE), James W. Suliburk, MD, FACS (Asst. Prof. of Surgery, Baylor College of Medicine), Siddharth Satish (Founder and CEO, Gauss Surgical)

** All references are made available upon request*