Yash Sanghvi

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Research Interests

Computational Imaging, Inverse Problems, Signal Processing, Compressive Sensing, Machine Learning

Education

- **Indian Institute of Technology Bombay**, Mumbai, India *Jul.'13 - Jul.'18*
  Dual Degree (B.Tech. + M. Tech.) in Electrical Engineering
  Thesis Title: "Application of Wavelets in Inverse Scattering"
  Advisor: Prof. Vikram M. Gadre
- **Shishukunj International School**, Indore, India *Jul.'11 - Mar.'13*
  Central Board of Secondary Education (Intermediate)

Academic Achievements

- Awarded **Certificate of Appreciation** for commendable performance of T.A. duty in the undergraduate course *Network Theory*, held in Autumn Semester *2017*
- Awarded **Undergraduate Research Award [URA-01]** for project titled *'Chirp Signal Parametrization using Particle Swarm Optimization'* *2015*
- Secured All-India-Rank **256 out of 1.4 million students** in Joint Entrance Examination *2013*
- Received the **Kishore Vaigyanik Protsahan Yojana (KVPY) fellowship**, instituted by the Department of Science and Technology, Government of India *2012*

Selected Work and Research Experience

- **Wavelets in Inverse Scattering** | Master's Thesis
  Guide: Prof. V.M. Gadre *May'17 - May'18*
  - Formulated iteratively reweighted variation of the joint ℓ_1-ℓ_2 regularization Born iterative method to obtain improved dielectric profile reconstructions.
  - Explored wavelet-sparsity based methods to solve the inverse scattering problem under the assumption of Born approximation.
  - Developed a non-linear constrained optimization framework to solve inverse scattering problem. The local minima encountered are circumvented by a penalty function based approach to imposing physical constraints.
- **Real Time Beat Tracker** | IEEE Signal Processing Cup
  Guide: Prof. V. Rajbabu *Oct.'16 - Dec.'16*
  - Formulated a novel real-time beat tracking algorithm with ability to account for time-varying tempo and implemented on a Raspberry Pi; achieved 55.13% accuracy on the test dataset
- **Texas Instruments, Bangalore** | Summer Intern

Time-of-Flight Camera Team *May'16 – Jul.'16*

- Developed novel metrology system to extract dimensions of objects from ToF images using classical computer vision based methods. The metrology system was integrated into *Voxel Viewer*, the in-house software for depth image visualization and camera-to-PC interface.
- Formulated a novel calibration procedure for low resolution depth camera (60×80 and 240×320) which simultaneously estimated the camera parameters (optical center and focal length) and per-pixel phase offset.

- **Design Engineer** | IIT Bombay Racing
  Battery Management Subsystem *Mar.'15 – Apr.'16*
  - Designed and assembled 389V battery from lithium ion cells, along with auxiliary management system for voltage & temperature monitoring of cells
  - Designed an integrated PCB responsible for interfacing battery and motor controllers which included several smaller components such as pre-charge discharge circuits, energy monitoring

- **Chirp Signal Parametrization**
  Guide: Prof. V.M. Gadre *Feb.'14 - May'14*
  - Estimated parameters of quadratic chirp signal i.e. start frequency and chirp rate through a Particle Swarm Optimization (PSO) framework; awarded **Undergraduate Research Award [URA-01]** for successful completion of project with exemplary results

Teaching

- **Introduction to Machine Learning** | Teaching Assistant
  Instructor: Prof. Amit Sethi *Jan.'18 - Apr.'18*
  - Evaluated assignments, mid-semester and end-semester answer scripts of 120+ students

- **Network Theory** | Teaching Assistant
  Instructor: Prof. V.M. Gadre *Jun.'17 - Nov.'17*
  - Regularly reviewed tutorial solutions posted online; evaluated answer scripts and assignments
  - Awarded **Certificate of Appreciation** as recognition for commendable work as TA

- **Fundamentals of Wavelets** | Teaching Assistant
  Instructor: Prof. V.M. Gadre *Jan.'17 – Apr.'17*
  - Actively involved in planning and design of a massive open online course **(MOOC)**
  - Formulated questions for problem sets, mid-semester, and end-semester examinations

Mentorship

- **Department Mentor** | Academic Mentorship Program *Mar.'15 – Mar.'18*
  - Mentored 2 academically under-performing students in improving their scores, as a part of Department Academic Mentorship program (D-AMP)
  - Served as Department Coordinator of the program (2016-17), leading a team of 25 undergraduate mentors and acting as an interface between the department and student community.

Standardized Test Scores

- **GRE**: **333/340** (Reading: **163/170**, Quantitative: **170/170**, AWA: **4/6**)
- **TOEFL**: **114/120** (Reading: **29/30**, Listening: **30/30**, Speaking: **26/30**, Writing: **29/30**)