Ameya Anjarlekar

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Education

- **Indian Institute of Technology Bombay** — Mumbai, India
  Bachelor of Technology in Electrical Engineering (with honors); ***CPI: 9.64/10*** — *(2017-2021)*

Completed a **minor** in **Computer Science and Engineering**

Publications

- Generalized Fractional Ambiguity Function and Its Applications
  Peeyush Sahay, Izaz Ahamed Shaik Rasheed, Pranav Kulkarni, Shubham Anand Jain, **Ameya Anjarlekar**, P. Radhakrishna Vikram M. G. Generalized Fractional Ambiguity Function and Its Applications. Circuits Syst Signal Process 39, 4980–5019 (2020)
- Generalized Fractional Matched Filtering and its Applications
  P. Sahay, **A. Anjarlekar**, S. A. Jain, P. Radhakrishna and V. M. Gadre, "Generalized Fractional Matched Filtering and its Applications," 2020 National Conference on Communications (NCC), Kharagpur, India, 2020, pp. 1-6, doi: 10.1109/NCC48643.2020.9055991
- A weighted generalized coherence approach for sensing matrix design
  Ameya Anjarlekar and Ajit Rajwade, "A weighted generalized coherence approach for sensing matrix design,"

Industrial Experience

- **Quantitative Researcher** — Quadeye Securities
  (June 2021 - May 2022)
  - Responsible for the improvement and successful operations of trading strategies in 2 regions
  - Worked on arbitrage-derived strategies to design high-frequency trading algorithms in derivatives segment
- **Video Compression for efficient Remote Support video storage [Doc]** — Daikin Industries
  Guide: Mr. Hari Prasad, Mr. Kumata Toshiaki — *(June 2020)*
  - Achieved around **70% video data compression** by developing a **Hitomi Camera**-inspired algorithm
  - Designed a video compression algorithm which can be **data independent** and also developed an improved algorithm for the case when training data is available

Research and Technical Projects

- **Sensing Matrix Design with Weighted Mutual Coherence [Doc]** — IIT Bombay
  Guide: Prof. Ajit Rajwade — *(August 2020 - October 2021)*
  - Proposed binary sensing matrix designs for compressed sensing. This was done by optimizing a random binary sensing matrix over our proposed generalized coherence based metric
  - Achieved better PSNR and SSIM reconstruction results than the sensing matrix designs available in literature. The sensing matrix can further be deployed in group testing for **COVID 19**
- **Generalized Time-Frequency Transform in Radar** — IIT Bombay
  Guide: Prof. V.M. Gadre, Dr. Peeyush Sahay(DRDO) — *(April 2019 - May 2020)*
  - Proposed **Generalized Frequency Ambiguity Function** for parameter estimation of chirp signals
  - Developed **Generalized Fractional Matched Filter** by which object parameters like acceleration and velocity can be more accurately estimated using Generalized Time-Frequency Transform
  - Received **IRCC Honorarium** for excellent R&D work in Radar Signal Processing
- **Supervised Detection of Tennis Ball from Camera Stream [Doc][Code]** — IIT-B Mars Rover Team
  University Rover Competition(URC 2019) — *(Aug 2018 - Dec 2019)*
  - Completed the **ball detection** competition task required in the **autonomous** operations of the rover
  - Devised an algorithm which comprises of first pre-processing the images, then using **transfer learning**

- **Image Reconstruction for Parallel MRI [Doc][Code]** IIT Bombay
  Guide: Prof. V.M. Gadre *(September 2018 - June 2019)*
  - Implemented a modified version of **GRAPPA** algorithm on **Xilinx Zynq-7000 FPGA Board** for image reconstruction used in the indigenous MRI machine at IIT Bombay
  - Awarded **Undergraduate Research Award** (URA-01) by IIT Bombay for this contribution

Key Course Projects:

- **Use of Residuals for Image Denoising (Guide: Prof. Ajit Rajwade)**: Implemented a denoising algorithm using the residual image. Also, studied and implemented metrics for quality of image denoising without the use of the reference image. Report can be found here
- **Blind Compressed Sensing (Guide: Prof. Ajit Rajwade)**: Reviewed various theoretical derivations of Blind Compressed Sensing and implemented the corresponding algorithm for joint estimation of dictionary and images. Report can be found here. Mathematical analysis is provided here

Academic Responsibilities

Department Academic Mentor

- Part of a team of **35** mentors after rigorous rounds of extensive peer reviews and interview
- Mentoring **6** sophomore students by providing academic guidance and help in other non-academic issues

Teaching Assistant

- Responsible for conducting tutorial sessions and evaluations for courses **PH 108** (Electricity and Magnetism), and **MA 108** (Differential Equations I)
- Head teaching assistant for the course **MA 207** (Differential Equations II) and responsible for conducting doubt solving sessions, paper setting and evaluations

Instructor: Machine Learning Bootcamp

- Conducted sessions on Deep Learning, K-Means, EM algorithm, Bayesian Models and Decision Trees

Scholastic Achievements

- Awarded the 'Institute Technical Special Mention' for contribution to technical sphere in the institute [2020]
- Secured an **AP** grade (awarded to less than 1% students) in course on differential equations (MA 207) [2018]
- Secured an All-India Rank **132** in **JEE - Advanced** and an All-India Rank **215** in **JEE - Main** [2017]
- Awarded fellowship by the Indian Institute of Science (IISC), Bangalore for securing an All-India Rank of **243** in **KVPY** (Kishore Vaigyanik Protsahan Yojana) out of around 80,000 students [2017]
- Among the top **500** students of the nation to be selected for the **Indian National Maths Olympiad** [2015]

Extra-curricular Achievements

- Responsible for conducting fine arts competitions for Mood Indigo, annual social fest of IIT Bombay [2017]
- Completed **NCC** (National Cadet Corps) training and attended its **Annual Training Camp** [2017]
- Volunteered career counseling drive organized by Abhyuday (Social service body of IIT Bombay) [2017]