Akshay Deodhar | Resume

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Education

- **College of Engineering, Pune** — **Pune**
  Computer Engineering, CGPA: 9.75 — *2017–Present*
- **Fergusson College** — **Pune**
  HSC, 92.4% — *2015–2017*
- **BVB's Paranjape Vidya Mandir** — **Pune**
  SSC, 95.2% — *2005–2015*

Academic Interests

A major goal is to understand computer systems right from Processors, Compilers to Application programs. I find functional programming and compilers fascinating, along with theoretical areas like formal models of computation, algorithms and graph theory. I have worked with orbital mechanics and rigid body dynamics simulations.

Research Experience

- **PROSPAR Group** — **IIT Kanpur**
  Sampling Sparse Matrices for SpMV format selection — *December 2019 – January 2020*
  - Worked on sampling of Sparse Matrices for selection of an optimum format for Sparse Matrix Dense Vector Multiplication. Designed sampling methods for preserving characteristics which decide the performance of SpMV on GPUs for a set of matrix storage formats. The end goal is to use these samples for cheap checking of performance of different formats before choosing one for the entire matrix
  - Wrote automation scripts for sampling sparse matrices, profiling SpMV, and evaluating the performance of sampling methods based on the execution time for the original matrix and the samples
- **COEP Satellite Team** — **Pune**
  Attitude Determination and Control Subsystem — *November 2017–Present*
  - Created a continuous-thrust orbit simulation for analysis of orbit raising orienations for the team's proposed solar sailing satellite. The simulation was build by using NASA's General Mission Analysis Tool as propagator along with a custom python module for orientation determination and thrust calculation.
  - Carried out validation of the simulation's accuracy. Did this by verifying the trajectories analytically, and by consulting existing literature in the area.

Selected Projects

- **Trillian- a command-line chess game with a minmax AI and alpha-beta pruning**
  A command line chess game in C with a minmax AI. Uses an efficient data structure that I designed which allows fast move calculation and generation. 3000+ lines of modular code and a readable main game loop.
- **RankRecommend- a rooted-pagerank based web app for github follow recommendations**
  A Python based Flask app which uses NetworkX and Numpy for ranking users in the github follow graph neighbourhood of a particular user based on the rooted pagerank eigenvector. Bootstrap used for frontend.
- **KilliKuthe- a Flask + MySQL web server for tracking access to college laboratory keys**
  A simple app which solves a real problem. Database tracks permissions for using keys, memberships of student groups, and implements a "handshake" mechanism for transferring a key from one student to another. Designed the replace the register entry system currently in use

Publications

- **Attitude control using 3 axis magnetorquers and pitch axis reaction wheel for solar sailing satellite COEPSAT-2**
  69th International Astronautical Congress (IAC), Bremen, Germany
  Co-authored with 6 others

- **Analysis of solar sailing as a means of orbit maneuvering for nanosatellites in low earth orbit**
  71st International Astronautical Congress (IAC), Washington DC, USA
  Co-authored with 6 others

Skills

- **Programming:**
  - Proficient : C, Python
  - Familiar: Scheme, x86 Assembly, Bash, C++
- **Tools:** Git, Linux utilities, LaTeX, Gnuplot, Make, Vim, Markdown
- **Languages:** English, Hindi, Marathi
- **Web Development:** HTML, CSS, Bootstrap, Flask, MySQL

Achievements

- Have a perfect grade in *all* Computer Science courses I have completed
- Selected for ACM India's compiler construction summer school
- Secured rank 106 in Maharashtra State Common Entrance Test among 300 thousand candidates
- Secured All India Rank under 10177 in IIT JEE Mains among over 1.3 million candidates
- Secured All India Rank under 6926 in IIT JEE Advanced among 220 thousand candidates
- Maharashtra State High School Scholarship

Extra-curricular activities

- **Blog**
  bri9k.github.io, About food, books, and other random stuff *April 2018–Present*
- **Chess Team**
  School, Fergusson, CoEP, Represented institutions in several events –
- **Writer, English Section**
  Abhiyanta Magazine, CoEP *September 2017–Present*
- **Event Head, *Retracer* (competitive coding event)**
  Mindspark, CoEP's technical festival *May 2019–Present*

Hobbies

Love reading fantasy, science fiction, and farce. Enthusiastic about trekking. Listen to (and attempt to play on harmonium) all kinds of music. Write a bit of limerick. Currently learning sculling.