Pratik Fegade **120050004**
Computer Science & Engineering **B.Tech.**
Indian Institute of Technology Bombay **Male**
Specialization: Computer Science and Engineering **DOB: 07/11/1994**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2016	9.50
Intermediate/+2	Maharashtra State Board	Ratanbai Walbai Junior College of Science, Mulund	2012	92.83
Matriculation	Maharashtra State Board	New English School, Kalwa	2010	96.91

Internships

- **Static Resource Bounds Inference for Functional Programs**
  Prof. Viktor Kuncak, École Polytechnique Fédérale De Lausanne *Summer 2015*
  - Worked on Leon, an automated system for verification and synthesis of functional Scala programs
  - Extended previous work on inferring time bounds to infer bounds on stack by attempting to model stack usage of the generated bytecode
  - Added increased support for non linear time bounds by using composition of bounds on number of recursive calls and time per recursion for recursive functions
- **Concurrent Program Verification**
  Prof. Thomas Henzinger, Institute of Science and Technology, Austria *Summer 2014*
  - Worked on concurrent program verification using the CEGAR approach
  - Integrated use of ordering predicates with the previous framework for straight line programs
  - Implemented a prototype to provide a proof of concept for the approach and proved Peterson's Algorithm to be safe
- **Stock Market Simulation**
  Edelweiss Financial Services Ltd. *Winter 2013*
  Worked on the Feed Generator algorithm that simulates the stock market given the desired price variation

Research Projects

- **Container based Virtualisation**
  Prof. Umesh Bellur and Prof. Purushottam Kulkarni, IIT Bombay *Autumn 2015*
  Exploring ways to improve the network and block IO isolation in the current container technology, especially in Docker containers
- **Code Vectorisation**
  Prof. Supratim Biswas, IIT Bombay *Autumn 2015*
  Working on vectorisation of sequential code involving CUDA
- **Load Generator Scalability Improvement**
  Prof. Varsha Apte, IIT Bombay *Spring 2015*
  - Worked on a AutoPerf, a load generator aiming to automate the process of testing performance of web server applications
  - Improved the scalabilty of AutoPerf across multiple cores as well as on the same number of cores by performing various optimizations in the code and the application environment

Course Projects

- **Compiler for a C-Subset**
  Prof. Amitabha Sanyal, IIT Bombay *Spring 2015*
  - Implemented a compiler for a subset of C to generate x86 like pseudo-assembly running on a emulated machine
  - Extended the Sethi Ullman code generation algorithm for other language constructs

- **File System Implementation for GeekOS**
  Prof. Dhananjay Dhamdhere, IIT Bombay *Spring 2015*
  - Designed and implemented a byte stream file system for GeekOS by emulating the disk by a file in the underlying file system
  - Optimized file system operations by implementing a hash-based page cache
- **Web Office Organiser**
  Prof. Nandlal Sarda, IIT Bombay *Autumn 2014*
  - Designed and implemented a web application for use in formal work places
  - Features included appointment scheduling, messaging, personal cloud storage and calendar management
- **Proposal for Multi-Coloured LEDs**
  Prof. Dipankar Saha, IIT Bombay *Spring 2014*
  - A proposal was given for a multi-coloured LED using multiple wells and quantum dots
  - The fabrication of the LEDs was considered and suitable materials suggested
- **Hardware Simulation of Pong**
  Prof. Dipankar Saha, IIT Bombay *Autumn 2013*
  Simulated the game of Pong at the gate level using the software Logisim
- **Simulation of a Microorganism Culture**
  Prof. Amitabha Sanyal, IIT Bombay *Spring 2013*
  Modelled a culture of sexually reproducing microorganisms demonstrating Mendel's Laws of Genetics through random genetic mutations leading to new species

Academic Achievements and Distinctions

- Pursuing honours in Computer Science, and a minor in Electrical Engineering
- Secured **All India Rank 16** in **IIT JEE** and **All India Rank 38** in **AIEEE** *2012*
- Invited for and attended the ITCSC-INC Winter School held at the Chinese University of Hong Kong, Hong Kong Winter 2014
- Offered **KVPY**, **NTSE** and **INSPIRE** fellowships

Interests

Program analysis, Computer Architecture, Computer Systems, Cryptography

Technical Skills

- Working knowledge of C++, Java
- Familiar with Scala, OCaml, LaTeX, Assembly

Positions of Responsibility

- **Teaching Assistant**
  Course: Software Systems Laboratory *Autumn 2015*
- **Teaching Assistant**
  Course: Signals and Systems MOOC on edX and IITBombayX *Spring 2015*
- **Department Academic Mentor**
  Mentored a group of sophomores in academic and general matters *2014–2015*

Courses Undertaken

- **Computer Systems**: Topics in Virtualisation, Cloud Computing and Storage Systems, Advanced Computer Architecture, Mobile Computing, Cryptography and Network Security
- **Compiler Technology**: Parallelizing Compilers
- **Electrical Engineering**: Special Semiconductor Devices, Signals and Systems, Control and Communications