Ameya Kisan Mohape
Computer Science & Engineering
Indian Institute of Technology Bombay

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M.Tech.
Male
DOB: 14/10/1994

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2020	7.81
Undergraduate Specialization : Computer Engineering				
Graduation	University of Mumbai	Ramrao Adik Institute of Technology	2017	7.89
Intermediate/+2	Maharashtra State Board	K. M. Agrawal College	2012	78.67
Matriculation	Maharashtra State Board	S. V. V. H. S.	2010	91.27

Areas Of Interest

- Blockchain Technology
- Distributed Systems
- Databases

Research Projects And Seminar

Improving the Civitas security model using Blockchain *(May'19 - Present)*

*(M.Tech. Project | Guide: **Prof. R. K. Shyamasundar**)*

- **Objective:** Create a provable blockchain solution to improve the security model of the Civitas voting system.
- Compared existing solutions of supervised and unsupervised remote digital voting systems.
- Extensively studied the Civitas system concerning coercion-resistance.
- Explored universal and voter verifiability properties of Civitas.
- **Future work** involves improving the security model of Civitas by exploring various blockchain solutions to refine the model's trust assumptions.

Consensus Mechanism in Bitcoin *(Jan'19 - Apr'19)*

*(M.Tech. Seminar | Guide: **Prof. R. K. Shyamasundar**)*

- Read about Byzantine and non-Byzantine consensus algorithms like Paxos, PBFT, and Raft.
- Compared Nakamoto consensus in Bitcoin with other consensus protocols.
- Simulated and analyzed Bitcoin protocol concerning critical parameters like block generation interval, block propagation delay, block size, stale block percentage, fork length, and network size.

Wireless Network Security Software *(Jul'16-Apr'17)*

*(B. E. Project | Guide: **Prof. Prashant Lokhande**)*

- **Objective:** Develop software with the capability to detect access point vulnerabilities and suggest prevention techniques to increase security by performing attacks on the access point.
- The project focused on MitM, DoS, MAC address spoofing, and DNS spoofing attacks.
- Designed the software to automatically capture the 4-way handshake and try cracking the AP password using dictionary and custom wordlist attacks.
- Recommended prevention techniques to improve security by performing listed attacks on the access point.

Course Projects

ASim: A Discrete Event Simulator of Algorand *(Jan'19 - Apr'19)*

*(New Trends in Information Technology | Instructor: **Prof. Vinay Ribeiro**)*

- The simulation was implemented in python and python-ecdsa was used for asymmetric key generation.
- Developed a gossip protocol for underlying network communication.
- Performed stake based cryptographic sortition and found block proposal of highest priority block proposer.

Automatic Creation of Indices in PostgreSQL *(Jan'19 - Apr'19)*

*(Implementation Techniques for Relational Database Systems | Instructor: **Prof. S. Sudarshan**)*

- **Objective:** Automatically create indices on non-key attributes by taking into account the frequency of scans performed by PostgreSQL during normal query execution.
- Modified the source code of PostgreSQL to extract and log the metadata of relation scans.
- Created a daemon process to periodically monitor the log and trigger index creation when the cumulative cost of relation scans exceeded the predefined threshold.

CollabInt: A Slack-like Coordination and Messaging Web Application *(Jul'18 - Nov'18)*

*(Software Lab | Instructor: **Prof. Umesh Bellur**)*

- **Objective:** Build a coordination system similar to Slack which allows teams to coordinate over projects.
- Built front-end using HTML & CSS and implemented chatroom using WebSockets.
- Used Django for the back-end to fetch and store user details.

Multi-threaded Key-Value Store and Load Generator *(Jul'18 - Nov'18)*
*(Design & Engineering of Computing Systems | Instructor: **Prof. Mythili Vutukuru**)*

- **Objective:** Implement a multi-threaded in-memory key-value store as a client-server application running over TCP sockets and test its performance by a self-developed closed-loop load generator.
- Analyzed performance of the key-value server by varying the number of threads on the load generator.

A simplified version of TCP as an application over UDP *(Jul'18 - Nov'18)*
*(Computer Networks | Instructor: **Prof. Vinay Ribeiro**)*

- **Objective:** Simulate a TCP sender and receiver on the application layer with UDP as the transport layer protocol.
- Graphically analyzed packet window size, sequence number and acknowledgment number with the sender sending out packets with varying loss probability.
- Observed that as loss probability decreased, maximum window size increased and retransmission of packets became less frequent.

Food Waste Management in India *(Jan'19 - Apr'19)*
*(System Dynamics: Modeling and Simulation for Development | Instructor: **Prof. Om P. Damani**)*

- Modeled the Causal Loop Diagram & Stock Flow Diagram for the system using Vensim simulation tool
- Successfully identified and demonstrated the management of food waste that has been generated by using it in applications such as bio-fuel, compost and animal feed to gradually reduce food waste.

Key Courses Taken

- Design and Engineering of Computing Systems
- Implementation Techniques for RDBS
- Foundations of Network Security and Cryptography
- New Trends in Information Technology
- Computer Networks
- Algorithms and Complexity

Positions Of Responsibility

Teaching Assistantship, IIT Bombay

- **New Trends in Information Technology** *(under **Prof. Vinay Ribeiro**)* *(Jul'19 - Present)*
  Assisted the instructor with the grading of exams, evaluation of programming assignments, handling of cribs and doubt solving in a class of 35+ students.
- **Computer Programming and Utilization** *(under **Prof. Ganesh Ramakrishnan**)* *(Jan'19 - Apr'19)*
  Worked with a team of 45+ TAs, conducted lab for 600+ undergraduate students, handled grading & cribs of 10+ students throughout the semester and provided all the assistance they needed.
- **Computer Programming and Utilization** *(under **Prof. Om Damani**)* *(Jul'18 - Nov'18)*
  Mentored group of 10+ students during labs, graded coding assignments, quizzes and handled cribs sessions throughout the semester with proper feedback.

Interview Coordinator for Placements 2018, IIT Bombay *(Dec'18)*

- Coordinated with a team of 250+ members for interviews of 1400+ students.
- Assisted in conducting Pre-placement Talks and Tests for 10+ firms.

Technical Skills

- **Programming Languages:** C, C++, Python, Java, BASH
- **Web Development:** HTML, CSS, Django, PHP
- **Tools and Technology:** Git, LaTeX, Vensim

Achievements & Extracurricular Activities

- Secured **99.76 Percentile** amongst **1,07,893** candidates in GATE Computer Science. (2018)
- Secured **A Grade** in **Embedded Systems** course from Concourse Software Training Institute. (2013)
- Secured **A+ Grade** in **All India - Certificate in Information Technology** course from AIMO. (2007)
- Completed **5KM PG Crossy GC** race organized by IIT Bombay PG Sports. (2018)
- Volunteered for **3x3 Rubik's Club Workshop** at IIT Bombay. (2018)
- Participated in workshop on **Wired Robotics** conducted by **IEEE-RAIT**, Navi Mumbai. (2012)
- **Excellent** performance in the course **Information Technology** in 10th standard. (2010)
- Participated in workshop on **Android Application Development** at RAIT, Navi Mumbai. (2016)
- Published paper titled **'Wireless Network Security Software'** in **AJCSE**. (2017)
- Secured **1st Class** in **Praarambhik** exam for **Harmonium** conducted by Akhil Bharatiya Gandharva Mahavidyalaya Mandal, Mumbai. (2006)