Diptyaroop Maji
Computer Science & Engineering
Indian Institute of Technology Bombay

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M.Tech
Male
DOB: 03/03/1994

Examination	University	Institute	Year	CPI/%
Post Graduation	IIT Bombay	IIT Bombay	2020	9.63
Graduation	Jadavpur University	Jadavpur University	2016	8.47
Intermediate/+2	ISC	Salt Lake School	2012	96.75
Matriculation	ICSE	Salt Lake School	2010	94.00

FIELDS OF INTEREST

- Networking, Distributed Systems, Network Security

WORK EXPERIENCE (2+ YRS)

- **Senior Software Engineer, Samsung Research Institute - Bangalore** *(Jun'16-Jun'18)*
  - Worked on code development and maintenance(product lifecycle management) in Android Mobile Hotspot project.
  - Wrote code primarily in Android framework & UX layers, which went into commercialization.
  - Worked on both flagship (Galaxy & Note series) as well as India specific models.
- **Software Intern, Samsung Research Institute - Bangalore** *(May'15-Jul'15)*
  - Worked on "Concurrent Effective Utilization of Wi-Fi Frequency Bands for Data Sharing in RSDB enabled devices".
  - Built a file-sharing app (team of 2) which uses both hotspot & Wi-Fi of a device simultaneously to create 2 channels (2.4 & 5GHz) for fast transfer of files 1 device to another.

MAJOR PROJECTS AND SEMINAR

- **Building end to end UPF data plane in 5G testbed** *(M.Tech Project, Guide: **Prof. Mythili Vutukuru**)* *(May'19-till date)*
  - **Objective:** Designing and developing UPF data plane in 5G and improving data plane throughput.
  - Part of the team that designed and developed the data plane of UPF over linux TCP/IP stack as per 3GPP specifications.
  - Developed a DPDK based UPF capable of saturating line rate in the data plane (tested on 10gbps NICs) while enforcing necessary QoS rules.
  - Currently working on further optimizing the UPF data plane processing and throughput. Techniques include integrating the DPDK UPF application with XDP in the linux kernel or SmartNICs, which will handle majority of the data plane processing.
- **Understanding 4G/5G Architectures and Optimizations**
  *(M.Tech Seminar, Guide: **Prof. Mythili Vutukuru**)* *(Jan'19-May'19)*
  - **Objective:** Literature survey of 4G & 5G architecture and their optimizations.
  - Studied 4G & 5G architecture and their limitations (both from protocol design and implementation aspects).
  - Did a comparative study of the solutions proposed (virtualizing NFs, rearchitecting EPC etc) to overcome those limitations and improve data plane throughput/decrease control plane latency.

RESEARCH PROJECTS

- **Benchmarking of Fast I/O Techniques** *(R & D Project, Guide: **Prof. Mythili Vutukuru**)* *(Jan'19-May'19)*
  - **Objective:** Benchmarking of different fast I/O techniques.
  - Compared performance of different fast I/O methods with respect to that of linux kernel stack for both long and short TCP connections.
  - Compared performance of different packet delivery techniques used by fast I/O methods in virtualized (single VM) as well as non-virtualized setup.
  - Evaluated performance of software switch forwarding packets to multiple VMs with multi-queue vNIC.

OTHER RELEVANT PROJECTS

- **Study and Implementation of Single Trace Attack against RSA key generation in Intel SGX SSL**
  *(Advanced Network Security and Cryptography, Guide: **Prof. Bernard Menezes**)* *(Jan'19-May'19)*
  - Studied a research paper on single trace attack against RSA key generation based on implementation flaws of Intel SGX SSL.

- Implemented and demonstrated (team of 3) the aforementioned side-channel attack to obtain the private key during RSA key generation.
- Implementation took less than 15 secs to recover the private key for 8192-bit modulus.

- **Algorand Simulator**
  *(New Trends in Information Technology, Guide: **Prof. Vinay Ribeiro**)* *(Jan'19-May'19)*
  - Studied Algorand paper which specifies a set of protocols for users to reach consensus on a set of transactions, even in the presence of dishonest users.
  - Implemented a discrete event simulator (team of 3), simulating a connected network of upto 64 users(including both honest and fail-stop adversary) where the nodes reach consensus on a set of transactions by following the said protocols.
- **T-Mem based cache implementation and partitioning policies for different mount points**
  *(Topics in Virtualization and Cloud Computing, Guide: **Prof. Purushottam Kulkarni**)* *(Jan'19-May'19)*
  - Studied concepts & kernel implementations (v3.4, as removed in latest kernel versions) of transcendent memory (tmem) frontend and backend.
  - Tried implementing tmem backend APIs (team of 2) in kernel v4.20 - mainly getting and putting pages into the tmem respectively from & to page cache in RAM.
- **Instant messaging application similar to Slack**
  *(Software Lab, Guide: **Prof. Umesh Bellur**)* *(Jul'18-Nov'18)*
  - Implemented a web-browser based instant messaging app (team of 4) similar to Slack.
  - Implemented functionalities like creating new workspaces/channels for secure communication between authorised users, registering via mail, reply to & deletion of previous messages, editing profile etc.

MAJOR COURSES TAKEN

Design and Engineering of Computing Systems	Advanced Network Security and Cryptography
New Trends in Information Technology	Topics in Virtualization and Cloud Computing

POSITION OF RESPONSIBILITIES

- **Senior Software Engineer, Samsung Research Institute-Bangalore** *(Apr'18-Jun'18)*
- **Interview Coordinator, Institute Placement Team, 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.
- **Student Companion, ISCP Team, IIT Bombay** *(Jul'19-till date)*
  - Coordinated orientation ceremony of 1867 PG freshmen with team of 174 student companions and coordinators.
  - Currently facilitating 7 freshmen on one-to-one bases; guiding them in their academic and co-curricular endeavors.
- **Teaching Assistantship**
  - **CS695**: Topics in Virtualization & Cloud Computing (**Prof. Mythili Vutukuru**). *(Jan'20-May'20)*
    Evaluated quiz & assignment, resolved associated cribs.
  - **CS744**: Design and Engineering of Computing Systems (**Prof. Umesh Bellur**). *(Jul'19-Nov'19)*
    Evaluating assignments & exams, resolving doubts related to assignments or course in general, assisting professor with creating assignments.
  - **CS224+CS252**: Computer Networks (Theory & Lab) (**Prof. Kameswari Chebrolu**). *(Jan'19-May'19)*
    Helped professor with weekly labs, invigilated & evaluated lab & theory exams, resolved associated cribs & general doubts regarding lab assignments or theory.
  - **CS305**: Computer Architecture (**Prof. Bernard Menezes**). *(Jul'18-Nov'18)*
    Invigilated & evaluated theory exams, resolved associated cribs.

TECHNICAL SKILLS

- **Programming Languages**: C, C++, Python, Java, Android, HTML, Shell script
- **Tools & Libraries**: Android Studio, Git, LaTeX, Perforce, DPDK

ACHIEVEMENTS & EXTRA CURRICULAR ACTIVITES

- **Hobbies:** Football, Swimming, Travelling
- **Won** Intra-departmental Football Tournament organized by CSE department, IIT Bombay. *(2019)*
- Secured **AIR 42** in GATE 2018 amongst 107893 candidates.
- Achieved **Professional** Level Software Competency in Samsung Research Institute Bangalore. *(2018)*