Yash Parmar

Software Engineer - Android
B2B Features' Development & Integration
JioSaavn Inc.

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Yash A. Parmar

Research Interests

Reverse Engineering, Cryptography, Cybersecurity, Android Development and SAT Theory

Education

Indian Institute of technology Bombay 2017-2021
B.Tech in Computer Science and Engineering **GPA: 7.19**
With Honors

Research Experience

PRNG Seed Recovery Using SMT Modelling *Spring 2021*
Guide: Prof. Bernard Menezes *Course Project, IITB*

- Implemented new approaches for state and seed recovery of commonly used Pseudo Random Number Generators - Mersenne Twisters, LFSRs and Truncated Linear Congruential Generators using **SMT** modelling
- Analyzed flaws in seed initialization phase of most commonly used general purpose PRNGs - Mersenne Twisters to recover 19937 bit state and initial seed using **32 bits of output** on a single core machine under **5 minutes**
- Developed new approaches for state recovery of Truncated LCGs for state recovery in $\mathrm{GF}(2^n)$ where lattice reduction approaches fail due to non existence of modular inverses using far less outputs with **no false positive** solutions

Automated Linear Cryptanalysis *Spring 2021*
Guide: Prof. Bernard Menezes *Course Project, IITB*

- Implemented automated linear cryptanalysis module for SPN ciphers by finding optimal linear biases for each s-box
- Capable of processing SPN networks of depth 6, p-box size 36 and 6 bit sboxes in less than 5 minutes

Malware Detector-Classifier *February 2021*
IITK Cybersecurity Hackathon *Team Project*

- Developed a malware detector cum classifier based on static analysis of program ensuring **zero risk** to host
- Processed 4700 files to train high accuracy
- Selected promenient features via ExtraTreeClassifier using **Decision Tree Classifier** as base estimator and achieved **85% accuracy** for subclass malware detection and classification

Professional Experience

JioSaavn *June 2021 - Present*
Software Developer - Android | Mentor: Nagendra Kumar *Mumbai*

- Part of B2B team developing scalable build variants of JioSaavn app for various multinational partners
- Developed build variant of app for B2B partnership and limited memory usage to 165MB; reduced by **58%**
- Fabricated feature rich build variant of JioSaavn for **Automotive OS** making JioSaavn available in majority of infotainment systems for cars

Samsung Research Institute *Summer 2020*
Enterprise Solutions - R&D | Mentor: Sanjeev Bhatt *Noida*

- Implemented **DigiLocker API** calls in android application using the **Retrofit HTTP** Client
- Fabricated an android app that extracts data from scanned PDFs using the **tesseract OCR** library
- Developed proof of concept implementation of the workflow of API calls for user sign-in, interaction and logout

Syphyn Innovations Pvt. Ltd. *Winter 2019*
Enterprise Solutions - R&D | Mentor: Sanjeev Bhatt *Pune*

- Developed an online bidding-based **e-Commerce** Android App using Kotlin with **Realm** Database
- Integrated the app with **MongoDB** database and **RPC** API calls implementing Unidirectional Streaming
- Tested and debugged the app using **JUnit** and BloomRPC; later released successfully on **Google Play Store**

Projects

Blockchain e-voting | Course Project *Summer 2020*

- Developed consortium blockchain based e-voting system using **Proof of Authority** consensus mechanism
- Implemented **coercion-free** and verifiable voting mechanisms to ensure liquidity of democracy
- Developed APIs of authentication server, voting interfaces, bootnodes and leaf nodes using **Flask** framework

Compiler for C-like Language | Course Project *Spring 2020*

- Developed a **language processor** in C++ using flex & bison for parsing and scanning C-like input
- Implemented variable scopes, arithmetic, conditionals, loops, **function calls** and buffered I/O on Linux kernel
- Provided additional options to view different **Intermediate Representations** such as tokens, **AST and TAC**

Dummy OS - xv6 | Course Project *Summer 2019*

- Built a **bash-like shell** in linux to execute user commands using system calls, process scheduling and signal handling
- Implemented **lazy allocation** for memory management and memory sharing for **inter-process** communication
- Added **new** system calls on top of original xv6 OS and implemented a **priority-based process** scheduler
- Implemented user space **locks**, condition variables & **semaphores** in xv6 using primitive system calls of xv6 kernel

Shell File Server Client | Course Project *Spring 2019*

- Developed a shell-based file server using **Socket programming** capable of handling multiple concurrent clients
- Implemented user authentication and multiple sockets for a user enabling simultaneous parallel downloads

Stock Market Price Forecast | Course Project *Summer 2019*

- Forecasted stock prices using **LSTM RNN** technique and **Adam Optimizer** for fast convergence
- Trained the model over daily stock price data of past **1 year** and forecasted next **30** days of price data

Multiplayer Chess | Course Project *Summer 2017*

- Simulated an interactive cross-platform GUI for a 2D chess board game in **Racket**, a multi-paradigm language
- Utilized **mini-max algorithm** for player vs computer mode; enhanced time efficiency using **alpha-beta pruning**

Quiz Interface | Course Project *Autumn 2018*

- Created a website for professors that helps them conduct quizzes and analyse the student performance graphically
- Maintained sophisticated database in **MySQL** in a way that allows professors to be selective about who takes quiz
- Developed **Android app** which hosts live quizzes and updates the database and the web interface in **real time**

Online Platform for Response Submission | Self Project *Summer 2018*

- Developed a fully functioning website with user login interface with auto and user input-based database update
- Developed a responsive website with countdown timer and auto rank update using Ajax, JavaScript and jQuery
- Successfully deployed the model on the **official Techfest website** and conducted one of its competition

OSPF Protocol for Routers | Course Project *Spring 2019*

- Implemented Open Shortest Path First **(OSPF)** algorithm of the **IGP** protocol in VHDL language
- Coded Dijkstra's algorithm in VHDL to increase the efficiency; used **FSMs** to integrate all the components and create a single autonomous forwarding table of a router at network level

SAT Solver | Course Project *Spring 2018*

- Implemented **SAT** solver based on **DPLL** algorithm in functional programming paradigm in Racket
- Implemented recursive literal assignment and backtracing for finding satisfying assignment of formula in CNF

Positions of Responsibility

Internship Coordinator *May 2019 - April 2020*

Internship & Placement Cell, IITB *Mumbai*

- Part of **35** membered team entrusted with the task of streamlining internships for **2000+** students
- Contacted and maintained relations with **200+** firms and **10+** universities all over the world
- Planned and conducted institute-wide coding tests helping **300+** students to enhance their internship preparation

Coordinator | Competitions Dept. *Sep 2018 - Dec 2018*

Techfest | Asia's Largest Science and Technical Festival *IIT Bombay*

- Spearheaded a team of **20** volunteers and successfully executed National and International level competitions
- Successfully conducted **International Full Throttle**, the first Remote Control car racing competition in India

Coordinator | Food & Beverages Dept. *Sep 2018 - Dec 2018*

Mood Indigo | Asia's Largest Cultural Festival *IIT Bombay*

- Negotiated with **3** companies for sponsorship deals of worth over **1.4 lakh INR**
- Worked in a **team of 30+** members to manage the Food and Beverages requirement as well as Hospitality need of celebrities, artists and participants spanning across **200+ events** in the 4-day fest

Extracurriculars

- Awarded **special mention** for ethics and work as Internship Coordinator from Placement Cell, IIT Bombay *(2020)*
- Successfully completed a yearlong **National Sports Organization** program in **Volleyball** *(2017)*
- Secured 5th position in **Group dance** competition in Dance Mania, college inter hostel competition *(2017)*
- Reached **District level** championship in inter-school **Chess** competition *(2015)*