Chaitanya Rahalkar

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Education

- **Savitribai Phule Pune University** — Pune, India
  Bachelors of Engineering in Computer Engineering; GPA: 3.90 (9.55/10) — *July. 2016 – June. 2020*

Courses Undertaking

Distributed Systems; Data Mining & Warehousing; Data Analytics; High Performance Computing; Artificial Intelligence

Experience

Professional Experience

- **Persistent Systems** — Pune, India
  Project Intern — *May 2019 - Present*
  - Working on End-to-End Lung Cancer Screening with Chest Computed Tomography Scans using Convolutional Neural Networks.
  - Working on creating a unified interface for radiologists & researchers to analyze CT scans.
  - Supporting the unified application using XAI (Explainable AI) to simplify the analysis of the scans.

- **Continuous Encryption/BigO Data** — Pune, India
  Project Intern — *July 2019 - Present*
  - Working on the design and development of a secure software-defined perimeter network.
  - Building a secure and robust SDN interface supported with high performance aspects.

- **Quick Heal Technologies** — Pune, India
  Project Intern — *June 2019 - November 2019*
  - Developed a Zero Trust security framework model that allows corporate employees to work securely from any location eliminating the need for VPNs.
  - Developed a PoC using open-source programs and frameworks - Django, OSQuery, MongoDB, and Redis (Caching System) and PyInstaller (Code packaging)

- **MVPR Solutions** — Pune, India
  Project Intern — *Jaunary 2019 - June 2019*
  - Worked on a bank reconciliation project. Designed and deployed Oracle database on a VPS.
  - Developed a backend system using Django framework for the administration panel
  - Worked on developing a software that reconciles transaction records of the bank and transaction history of its customers.
  - Used data analytics to provide a statistical overview of the reconciled records.

Research Experience

- **Pune Institute of Computer Technology** — Pune, India
  Research Intern — *May 2019 - October 2019*
  - Worked on the study of side-channel attacks that target the virtualization level (the lowest level of the software stack) of an Operating System.
  - Assisted in creating a meta classifier-based ensemble learning model for attack detection.

- Developed a granular performance monitoring script to generate system logs.
- Researched various techniques used by attackers to exploit private information from the set of target virtual machines running on cloud platforms.

- **Indian Institute of Science (IISc)** Bangalore, India
  Summer Fellow *July 2019*
  - Attended a research-based summer school organized by the Computer Science department at IISc Bangalore to learn cutting edge technologies and explore research areas in Computer Science.
  - Presented my project - WebTTY during the summer school's project presentation session.

Projects

Major - Open-Source & Documented

1. Frost Linux: (GitHub Repository)
   - Frost Linux is a Linux distribution based on Arch Linux. Frost Linux is designed specifically for engineers and developers.
   - It comes pre-bundled with software tools and packages prominently used by developers. It has a huge list of rich software created by the FOSS community.
   - It has a custom compiled and security-hardened Linux kernel with support for running sandboxed applications. (Using Firejail)
   - This project is inspired by the Linux From Scratch project.
2. Cedit: (GitHub Repository)
   - Cedit is a zero-dependency text editor for the terminal. Cedit is similar to other popular editors like Vim, Emacs, Nano, etc. It is designed with the philosophy of minimalism and simplicity.
   - It requires no external libraries (Not even curses) or dependencies for installation. It is just a single-file C program that caters to all your editing needs.
   - Currently, it supports syntax highlighting for over 20 programming languages and provides fast incremental searching.
   - A statically compiled binary can allow it to run even on devices without the standard C library. This has facilitated the text editor to be used in embedded devices, routers, PoS terminals, which have very limited disk space. Cedit conforms to VT100 key and escape sequence bindings.
3. WebTTY: (GitHub Repository)
   - WebTTY is a Swiss Army knife tool that implements the following functionalities:
     i Share your terminal as a web application.
     ii Create secure introspectable tunnels to localhost useful to share web applications to remote developers.
     iii Share services running on localhost, eliminating the hassle of setting up network port forwarding, DNS and static IP addresses.
4. Password Manager: (GitHub Repository) (Research Paper)
   - A CLI Password Manager written in NodeJS.
   - It is a stateless, secure and highly reliable master-password-based password manager that ensures that the data doesn't leave your device.
   - It uses extremely secure hashing and encryption algorithms with no known cryptanalysis attacks.
5. Cyberfort CTF Website: cyberfort.rocks
   - It is an online platform to test and advance skills in penetration testing and Cybersecurity.

Publications

1. Rahalkar, Chaitanya Virgaonkar, Anushka Gujar, Dhaval Patkar, Sumedh. (2020). End-to-End Lung Cancer Diagnosis on Computed Tomography Scans using 3D CNN and Explainable AI. International Journal of Computer Applications. 176. 1-6. 10.5120/ijca2020920111. (Link)

2. Rahalkar, Chaitanya, and Dhaval Gujar. "Content Addressed Peer-to-Peer File System for the Web with Blockchain-based Metadata Integrity." IEEE International Conference on Advances in Computing, Communication and Control. IEEE, 2019 (Link)

3. Oak, Rajvardhan, Chaitanya Rahalkar, and Dhaval Gujar. "Poster: Using Generative Adversarial Networks for Secure Pseudorandom Number Generation." Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security. ACM, 2019 (Link)

4. Rahalkar, Chaitanya, and Dhaval Gujar."A Secure Password Manager." International Journal of Computer Applications 975: 8887. (Link)

Talks & Presentations

1. **Hidden Secrets of Python** (Presentation Slides) - A talk on hidden modules and packages in Python.

2. **Ethics for Platforms** (Presentation Slides) - A talk on how social media and the Internet are exploiting our privacy and selling our data.

3. **Content Addressed Peer-to-Peer File System for the Web with Blockchain-Based Metadata Integrity** (Presentation Slides) - A seminar on a proposed approach for a peer-to-peer file system that maintains file-integrity using Blockchain Technology.

4. **Cryptocurrencies and Blockchain** (Presentation Slides) - An explanatory talk about blockchain, cryptocurrencies and the impact of a decentralized financial system on the world economy.

5. **MongoDB (NoSQL Databases)** (Presentation Slides) - A talk on the features of NoSQL & an introduction to MongoDB.

Program Committees & Organisations

- **IEEE Student Branch at Pune Institute of Computer Technology** - Programming Head
- **Impetus & Concepts** - Co-founder & creator of a Cybersecurity competitive event (Capture the Flag)