Swetha Ranganathan

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EDUCATION

PES University Bangalore, India

Bachelor of Technology in Computer Science and Engineering

***CGPA**:* 8.66. Courses: Applied Cryptography, Machine Learning, Graph Theory, Blockchain, Robotics

Awards: Prof. MRD Scholarship (top 20%), Prof. CNR Scholarship (top 20%), Distinction Award

SKILLS

Skills: Quantum Cryptography, FPGA Programming

Programming Languages: Python (proficient), C(moderate), Rust (Basic), JavaScript(proficient), ARM Assembly Language, MATLAB(Basic)

Machine Learning: PyTorch, pandas, numpy, scikit-learn, HuggingFace, Keras, TensorFlow

Database Management Systems: MySQL, MongoDB, Neo4j

Tools and Platforms: Linux, Git (Basic), IBM Qiskit, Jira

Additional Skills: 3D Modelling on Fusion 360 (CADD)

EXPERIENCE

Centre for Computer Networks and Cyber Security, PES University Bangalore, India

Research Intern in Quantum Cryptography & Communication *June 2024 – July 2024*

- Developed a hybrid protocol combining Quantum Key Distribution (QKD) and Post-Quantum Cryptography (PQC) for unbreakable communication, implementing QKD for key distribution and PQC for message encryption using IBM Qiskit and Python's Liboqs library.

M.S. Naatyakshetra Bangalore, India

Website Developer *Nov 2024 – Dec 2024*

- Designed and developed a responsive website to showcase theatrical productions, enhancing audience engagement.
- Utilized technologies such as HTML, Tailwind CSS, JavaScript, Node.js, React, Express.js

PROJECTS

Thrift store Database Management system | *Python- Tkinter, MySQL*

- A simple Database Management system for a thrift store, where one can donate and buy clothes as per their choice.

Real Time Analog Clock using Python | *Python - Tkinter, Turtle, Geopy, TkinterMapView*

- Analog Clock to find the time of any country by displaying an interactive world map, where in the desired country can be clicked which in turn displays the analog clock of the chosen country.
- Use of TkinterMapView, Geopy, TimeZoneFinder, and Turtle modules of Python

Basic Functionality Terminal Shell using C language | *DSA – Strings, Arrays, Linked Lists, Windows API*

- Implemented functionality to parse user commands into executable components and execute them, leveraging Windows API for external command recognition and execution.

Development of Chat Application using C Language | *Computer Networks, C Language*

- TCP-based chat application in C for server-client communication.
- Communication between two different systems secured with SSL Certificates.

Creating a Process Tree using C Language |*Operating Systems, C Language*

- Creation of kernel threads in a binary tree structure and manages processes using linked lists. Utilizes a timer to periodically record CPU usage for system monitoring.

Design & Development of an FPGA-based Quantum Cryptography Protocol | *Qiskit, Python, Verilog*

- Currently working on the development of a secure communication to prevent quantum attacks by integrating the concepts of PQC, QKD and acceleration using FPGA's.

CERTIFICATIONS

- **Hackerrank Certification in DSA (Intermediate)**
- **Introduction to Linux, PESU I/O**
- **CIE Level 1 – Center for Innovation and Entrepreneurship**

SELECT PUBLICATIONS

[1] Swetha Ranganathan, Shanmitha Karthikeyan, Chandrashekhar Pomu Chavan, Shanthala P T. Integrating Quantum Key Distribution (QKD) with Post-Quantum Cryptography (PQC): Combining the BB84 Protocol with Lattice-Based Cryptographic Techniques. 4th IEEE International Conference on ICT in Business, Industry and Government (ICTBIG2024), 13-14 December 2024