**Tirthraj Mahajan**

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LinkedIn: <https://www.linkedin.com/in/tirthraj-mahajan/> GitHub: <https://github.com/tirthraj07>

Summary

A passionate software engineer who is driven by attention to detail & specializing in Full Stack Web Development. Dedicated to building robust, scalable systems. Actively seeking opportunities to contribute to organizational success and continuously learning and adapting to new technologies.

Skills

**Core Competencies** - JavaScript · Next JS · NodeJS · Express JS · Python · Flask · MySQL · PostgreSQL · Supabase · Firebase · CSS · Bootstrap/Tailwind/Shadcn · Git · GitHub · C++ · Java · NGINX · Docker · AWS

**Fundamentals -** Backend Development · Database [DBMS] · Data Structures and Algorithms · Object Oriented Programming [ OOP ] · Distributed Systems · Cybersecurity

**Extras** – Familiarity with REST APIs · GraphQL · gRPC · Web-Sockets · API Integration & Security · Postman · Software Deployment · Software Design

Projects & Publications

[**Scalp Smart**](https://github.com/tirthraj07/ScalpSmart) [S.E Project]

**Tech: Flask, Firebase, SQL , JavaScript, HTML, CSS, Bootstrap**

**Achievement**: Runner-up in PICT's Impetus and Concepts

A platform designed to predict baldness stages using AI and Computer Vision via images uploaded by users. It provides predictions indicating the various stages of baldness. **Responsible for designing & developing the backend, frontend and the database schema**. Can be found at: <http://scalpsmart.onrender.com/>

**[Local Shrinks](https://github.com/tirthraj07/Local-Shrinks)** [Hackathon Project]

**Tech: Next JS, Firebase, Tailwind CSS**

**Achievement:** Runner-up at Techfiesta Hackathon (36 Hour hackathon)

A platform that provides easily accessible mental health support, including real-time counseling, stress management tools, and mood tracking. Developed a chatbot & a question-based algorithm for diagnosing depression and anxiety.

**Responsible designing & developing the backend, frontend and the entire database schema.** Can be found at: <https://techfiesta-web.vercel.app/>

**[C++ Micro Web Framework](https://github.com/tirthraj07/CPP-Web-Server/)** [Personal]

**Tech: C++ and Network Programming (Winsock2)**

Created a web framework (similar to ExpressJS) from scratch which supports all types of HTTP requests. Key features of this framework include fast routing via AVL Trees, rapid response rendering, middleware chaining and SQLite Database connectivity. Utilized Windows Socket API (Winsock2) for network communication.

**[DigiBank](https://github.com/tirthraj07/Bank-App)** [Barclays Hackathon]

**Tech: Next JS, Node JS + Express JS, Supabase, Shadcn UI, Web Sockets**

A banking platform for secure document upload & complaint management portal. Key features: Complaint Classification, Prioritization, Summarization & Ticket Status Monitoring. Utilized industry standard Cyber Security algorithms like RSA, AES and Scrypt. **Published research paper titled “Secure Encryption of Documents and Smart Complaint Management for Banking Applications.”** Can be found at: <https://pijet.org/papers/volume-1%20issue-2/Final%20Revised%20Paper_Pijet-12.pdf>

[**Dynamic Memory Allocator**](https://github.com/tirthraj07/Memory-Allocator)[Personal]

**Tech: C++**

Created a custom memory allocator in C++ from scratch designed to manage memory with fine control and efficiency. It implements chunk-based memory management using a best-fit allocation strategy and a binary search tree (BST) to track free chunks by size. Used the sbrk system call to manage heap space, providing dynamic expansion and shrinkage of memory as needed and reducing internal fragmentation of memory. Implemented new keyword functionality to support for object oriented programming

[**Query-Cortex**](https://github.com/tirthraj07/Query-Cortex/) [Hackathon Project]

**Tech: Next JS, Firebase,** **Docker, Flask, Fast API, Postgresql, Gemini**

**Achievement:** Winner at Pulzion (PICT ACM Student Chapter’s Event) Hackathon – Web N App

Developed a solution that enables users to interact with databases using natural language questions and receive insightful answers. The solution leverages natural language processing (NLP) to understand user queries, optimize database access using indexing, and generate concise answers. Furthermore, the solution contains the capability to transform database query results into interactive charts

All Projects can be found at <https://tirthraj07.onrender.com/projects/>

Experience

**Persistent Systems Mentorship Program** Jun 2024 – Aug 2024

Developed an internal tool for Persistent Systems which automates employee pre-onboarding process. Key features: BGV Document upload & hosts videos necessary for an new joining employee for post-onboarding processes. Additionally includes security groups for permission based access control. **PICT Inhouse Internship** (Virtual Lab Assistant) Feb 2024 – Apr 2024

Created a website that lets students visualize the lab practical easily and learn theory behind them

**AWS Cloud Club** **PICT** (Technical Team Member) Apr 2024 - Present

Education

**Pune Institute of Computer Technology** (B.E Computer Engineering) 2024-2026

CGPA : 9.5

**S.P. College, Pune** 2022

HSC Score: 92.83%

**SPM English School, Pune**  2020

SSC Score: 92.60%

Additional

* Pulzion (ACM Student Chapter’s Event) Winner 2024: Web N App for our project Query Cortex
* Pulzion (ACM Student Chapter’s Event) Winner 2023: Web N App, Hire Hustle, Dexterous
* Technical Writer on Medium: <https://medium.com/@tirthraj2004>
  + [Introduction to Microservice Architecture](https://medium.com/@tirthraj2004/introduction-to-microservices-architecture-b8a0dd7dbbc3)
  + [Introduction to Database Clustering using PostgreSQL , Docker and Pgpool-II](https://medium.com/@tirthraj2004/introduction-to-database-clustering-using-postgresql-docker-and-pgpool-ii-ac2a7bf96a5f)
  + [Deploying a Node JS Application on EC2 Step by Step](https://medium.com/@tirthraj2004/deploying-a-node-js-application-on-ec2-step-by-step-62e09fb9b88f)