Anirudh Pulavarthy

Chicago, IL | (309) 832-3484 | anirudhpulavarthy96@gmail.com | LinkedIn | GitHub | Portfolio

Professional Summary

Full stack developer with 8+ years of experience building reliable, scalable, and modular applications using Java, Node.js, and React. Proficient in designing RESTful services and microservice architectures with a strong grasp of both NoSQL and SQL systems. Experienced in Python programming and research involving Topological Data Analysis (TDA), mesh processing, and persistent homology. Collaborative and solution-driven with strong Agile and Scrum experience. Graduate of IIT Jodhpur with a strong academic foundation and recognized for academic merit through competitive scholarships. Actively pursuing opportunities to apply full stack expertise in impactful, scalable systems.

Technical Skills

Programming Languages: Python, Java, C++, MS SQL, Visual Basic, R, Rust, C#, Scala
Frameworks & Libraries: WPF, MFC, GUDHI, Spring, React, Node.js, Express, Angular (basic)
Databases: MongoDB, PostgreSQL, MySQL, Microsoft SQL Server
Tools & Platforms: Docker, Git, Azure DevOps, REST, JWT, gRPC, Tableau, Unix, LaTeX
Testing & CI/CD: Jest, JUnit, Postman, GitHub Actions, Azure Pipelines
Version Control: Git, GitHub, Azure DevOps, GitLab

Professional Experience

Senior Software Developer June 2020 – Aug 2022
Hexagon Capability Center India *Hyderabad, India*

- Developed a full-stack MERN dashboard for Cabinet Vision engineers using React.js/Redux and Node.js/Express, improving workflows and enhancing usability.
- Designed and maintained RESTful APIs and dynamic schemas in MongoDB for CNC configuration logic.
- Deployed applications to Azure Virtual Machines and containerized services using Docker for consistent environments.
- Implemented JWT-based authentication and role-based access control to secure configuration endpoints.
- Integrated React Router and Redux Thunk to handle routing and asynchronous data flows.
- Worked across legacy and modern systems, bridging React interfaces with MFC/COM-based Windows components.
- Mentored three new developers by conducting structured learning sessions, and promoted a growth-oriented team culture.
- Served as Scrum Master for six sprint cycles, improving sprint velocity and team productivity.
- Conducted API testing with Postman and contributed to CI/CD pipelines using Jest and JUnit.
- Built Kafka-based message adapters to communicate with internal microservices.
- Partnered with product teams to gather engineer-specific requirements, translating them into modular and scalable features.
- Designed custom UI flows and dynamic component-based forms for configuring machine profiles and CNC parameters.
- Conducted performance optimization on backend API response time and frontend rendering, reducing load latency by 25%.
- Recognized as Star Employee of the Year and was a member of the Star Team of the Year for the year 2021.

Software Developer Dec 2017 – Jun 2020
Hexagon Capability Center India *Hyderabad, India*

- Developed and maintained Node.js APIs interacting with Java-based CNC modules.
- Collaborated on defining and refining API contracts to integrate React frontends with legacy Java services.
- Secured backend endpoints using JWT-based route protection and middleware authentication.
- Collaborated with a team of 5 in a critical code refactoring project, converting up to 47,000 instances of point-based geometrical shapes to line-based entities, improving performance of Cabinet Vision's legacy codebase.
- Developed an MFC-based utility to transform user data from SQL databases into package files, reducing data transfer time by 40% and enhancing interoperability across different versions of Cabinet Vision.

Education

DePaul University | M.S. in Computer Science, GPA: 3.62 / 4.00 *Sep 2022 – Nov 2024*

Indian Institute of Technology Jodhpur | B.Tech in Systems Science, GPA: 3.34 / 4.00 *Jun 2013 – Jul 2017*

Internships & Assistantships

Computer Science Teaching Assistant Mar 2023 – Nov 2024
DePaul University *Chicago, IL*

- Evaluated and graded 500+ coding assignments and exams over five terms for *SE450: Object-Oriented Software Development*.
- Assessed and provided detailed feedback on code implementations covering Design Patterns, Object-Oriented Design principles, and Visual Modeling, enhancing student understanding and coursework quality.
- Ensured consistent application of grading rubrics and accelerated feedback turnaround time by 20%.

Summer Research Intern Jul 2024 – Sep 2024
University of Oregon *Eugene, OR*

- Contributing author for **Computing Optimal Persistent Cycles for Levelset Zigzag on Manifold-like Complexes.**
- Developed zigzag filtration models for Topological Data Analysis with Dr. Tao Hou. Worked on improving flow analysis techniques, boosting barcode generation efficiency by 30%.

Graduate Research Assistant Mar 2023 – Jun 2024
DePaul University *Chicago, IL*

- Developed topological visualizations in MeshLab, improving researchers' ability to interpret computational topology results.
- Constructed weighted dual graphs for manifold triangular meshes, and applied min-cut/max-flow algorithms
- Developed Python scripts to analyze complex triangular meshes and efficiently process datasets with up to 500,000 faces.

Academic Projects

File Indexing System | C++, Distributed Hash Tables (DHTs), Multi-threading

- Developed a scalable distributed file indexing system to support efficient search operations across networked nodes.
- Utilized Distributed Hash Tables (DHTs) for fault-tolerant indexing and optimized multi-threaded search to reduce lookup time.

Portfolio Website – DevChronicles | Angular, GitHub Pages

- Designed a personal developer portfolio using Angular to showcase projects and skills.
- Created a responsive design that uses routing with Angular modules and components. Deployed via GitHub pages.

Gossip Protocol Implementation for Distributed Systems | Java, UDP Sockets, Java Object Serialization, Concurrency, Scalability

- Designed and implemented a decentralized gossip protocol for efficient information dissemination and aggregation across networked nodes. Developed a multi-threaded system where each node independently communicates with peers using UDP sockets and Java Object Serialization, ensuring real-time data propagation.

Car Evaluation Analysis | Python, Scikit-learn, TensorFlow, Random Forest, Gradient Boosting, Multi-layer Perceptron (MLP)

- Built Machine Learning models to classify car acceptability using Random Forest, Gradient Boosting, and MLP classifiers.
- Applied SMOTE to handle class imbalance and performed hyperparameter tuning to improve model accuracy and robustness.

Flamethrower Game | Rust, Macroquad, ECS

- Developed a 2D game prototype using the Macroquad game engine, featuring a flamethrower mechanic with projectile-based firing and collision detection. *Source Code: GitHub*
- Applied ECS design principles to manage game entities, physics behavior, and interaction logic.
- Implemented projectile-based firing, collision detection, and sprite-based visual feedback to improve player interaction.

Activities

President of InterClub Committee | Hexagon Capability Center India

- Elected President of Interclub, a cultural and sports body at Hexagon India for 1500+ employees.
- Managed the finances of the committee and effective budgeting of funds approximately worth INR 8,500,000 (USD 100,000)

Professional Speedcuber | World Cube Association

- Organized several official WCA competitions in different regions of India.
- Ranked top 100 in India and top 2000 in the world for Blindfolded solving. WCA profile.
- Served as an executive member of the Deccan Cubing Club. Conducted several workshops to promote Speedcubing in India.

Publications

Dey, T. K., Hou, T. & Pulavarthy, A. (2025). **Computing Optimal Persistent Cycles for Levelset Zigzag on Manifold-like Complexes.** *arXiv preprint, arXiv:2105.00518v2 [cs.CG].*

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