# Pranchal Shah

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## Education

**MS in Computer Science** | ***Northeastern University*** | *Boston, MA* **Jan 2023 – May 2025**

Relevant Courses: Network Security, Kernel implementation, Computer Systems, OOP, Data Structures, Low level Software Security, Algorithms, Database Management

**B.Arch in Architectural Engineering** | ***Sardar Patel University*** | *India* **Aug 2014 – Dec 2019**

## Technical Skills

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|---|---|
| **Languages** | : Go, C/C++, Python, TypeScript, JavaScript, Java |
| **Web Technologies** | : Node.js, Django, Express, SpringBoot, React, RestAPI, GraphQL, gRPC, HTMX |
| **Database & Storage** | : PostgreSQL, MongoDB, Redis, Elasticsearch, Kafka, RabbitMQ |
| **DevOps & Cloud** | : AWS, GCP, Azure, Kubernetes, Docker, Terraform, Pulumi, Jenkins |
| **Tools & Observability** | : Git, Jenkins, Prometheus, Grafana, DataDog, Github Actions |

## Professional Experience

**FoxyAI** **May 2024 – Present**

*Software Engineer Intern* *Boston, MA*

- Engineered a high-throughput image processing pipeline using Docker and Golang microservices. Reduced processing time by 73% (from 10:37 to 2:53 mins) with batching items on message queues while handling 12M+ daily images
- Improved ML model inference speed by 12% using NVIDIA MPS scheduling on Kubernetes A100 clusters
- Implemented cross-cloud caching layer(AWS/GCP) reducing processing costs by 35%, processing 90M+ images weekly
- Produced serverless E2E testing infrastructure leveraging AWS (S3, Lambda, API Gateway, DynamoDB) achieved 65% faster test execution (120s to $< 42s$) through multi-threaded test orchestration
- Developed AWS SQS and PostgreSQL-based audit trail system handling 3000 QPS with 0.8ms average latency

**Sangath LLP** **Dec 2020 – Jul 2022**

*Computational Engineer* *Ahmedabad, India*

- Produced extensible C# plugin framework reducing manufacturing simulation time by 33% across modelling workloads
- Pioneered computational modeling framework for manufacturing components, guiding a team of 4 to achieve 33% faster design iterations and $800K annual material savings through simulation optimizations
- Automated Python workflows across 20+ projects, transforming 40-hour processes to 15-min computations of estimates

**Excellence Org** **Dec 2019 – Dec 2020**

*Software Engineer (Backend)* *Mumbai, India*

- Optimized high-traffic PostgreSQL cluster achieving 85% lower latency through partitioning and query optimization
- Utilized Redis for caching and invalidation patterns, achieving 40% reduction in database load
- Contributed to an internal platform featuring automated CI/CD pipelines, centralized logging, and custom Grafana dashboards, cutting deployment time from 2 hours to 15 minutes, providing real-time visibility into system metrics

## Projects

**Operating Systems Components** | *C, Assembly, Pthreads, Systems* **Sept 2024 - Present**

- Created 16-bit CPU emulator supporting 20+ instructions with 64KB virtual memory and 8 registers management
- Engineered user-level threading library with custom scheduler, and 90ns context switching wite 1000+ parallel threads
- Programmed a Unix shell supporting 10+ pipes and process management with I/O redirection and 15+ bash features

**Home lab Infrastructure** | *Docker, Prometheus, Grafana, Nginx* **Jan 2024 - Present**

- Initiated and deployed social forum serving 900+ weekly active users with 99.9% uptime on Raspberry Pi hardware
- Implemented Prometheus and Grafana observability stack monitoring 1000+ daily requests with 100ms p95 latency
- Deployed production-grade infrastructure with nginx, fail2ban, personal blog and git server handling 10k+ weekly visits

**Secure Messaging Protocol** | *Python, OpenSSL, Cryptography, TCP/IP* **Mar 2024 - Apr 2024**

- Designed custom end-to-end encrypted messaging protocol with perfect forward secrecy handling 100+ msg per second
- Developed PKI infrastructure creating and exchanging X.509 certificates with RSA key exchange and digital signatures
- Created secure session management with TLS-like handshake with achieving less than 50ms connection establishment