

Shivansh Ahuja

C++ Developer | ML Infrastructure Engineer

shivanshahuja.dev · shivansh.ahuja91@gmail.com · +91 8383916727 · India

SUMMARY

Systems-oriented developer focused on C++, distributed training infrastructure, and GPU-backed ML platforms. Built end-to-end orchestration, checkpointing, runtime launch, observability, and managed Kubernetes flows using Python, Go, Kubernetes, and Volcano. Background also includes Java backend development and graphics/game programming.

EXPERIENCE

C++ Developer Intern — Research Commons

May 2025 - Present

Remote

— C++ / ML SYSTEMS

- Built and optimized components of a C++ AI inference engine and ML framework from the ground up, working on low-level internals such as memory management, threading, execution flow, and performance-critical code paths.
- Wrote optimized kernel code for x86 and ARM, including **SIMD** paths with **AVX** and **NEON**, and also implemented **NVIDIA CUDA** kernels for selected workloads.
- Worked with systems and compiler-oriented concepts including multithreading, execution pipelines, compiler IRs, JIT techniques, profiling, operating systems, computer architecture, and digital design.
- Reverse engineered and broke down large frameworks such as **PyTorch** and **tinygrad** to understand **autograd**, tensor operations, and framework internals, then translated those learnings into team-facing implementation guidance.

— DISTRIBUTED TRAINING PLATFORM

- Built the entire **Kubernetes-native** distributed fine-tuning platform **end to end**, spanning a Python client framework, Go operator, **TrainingJob CRD** contract, and **Volcano**-based workload orchestration.
- Implemented lifecycle orchestration for **torchrun**, **DeepSpeed**, and Python evaluation runtimes across **Kubernetes** and **Volcano**, including submission, reconciliation, cancellation, and pause or resume flows.
- Built checkpointing and resume infrastructure in Python with **atomic commits**, async uploads, retention, orphan cleanup, and checkpoint status publishing for distributed training jobs.

— CLOUD / OBSERVABILITY

- Implemented managed **GKE** provisioning and validation using **Kubernetes**, **GKE**, **Workload Identity**, and **Artifact Registry**, including cluster bootstrap, preflight checks, and observability stack wiring.
- Added observability and reliability features using structured logs, **Prometheus** metrics, and pod-level restart or OOM diagnostics to improve debugging and production stability.

Scholar — SAP Labs India

Aug 2023 - Jul 2024

Bengaluru, India

- Developed backend APIs for payroll systems in **SAP SuccessFactors** using Java, **Spring Boot**, **J2EE**, and **SAP S/4HANA**.
- Integrated microservices across internal services and wrote automations and unit tests for production workflows.

Game Developer Intern — Indian Institute of Technology Delhi

Dec 2021 - Jul 2022

Delhi, India

- Built a VR pit simulation in **Unity** and contributed to additional simulation work during the internship.

PROJECTS

MegaMario · C++, SFML

- Built a Mario-style platformer in a personal game engine with ECS, factory-based entity creation, collision handling, scene management, and animation control.

OpenGL Graphics Engine · C++, OpenGL

- Built a basic 3D graphics engine using **OpenGL**, focused on rendering pipeline fundamentals and low-level graphics programming.

2D Physics Engine · C++, SDL2

- Implemented a custom 2D physics engine with core simulation and collision behavior for game-oriented use cases.

Geometry Dash Clone · C++, SFML

- Built a Geometry Dash-style game using **SFML** and a custom 2D vector and ECS-driven architecture.

TECHNICAL SKILLS

Languages: C++, C#, Java, Python, CUDA

Systems / ML Infra: Modern C++, multithreading, OpenMP, SIMD (AVX), memory management, distributed training, checkpointing, Docker, Kubernetes, Volcano, Ray jobs

Backend / Platform: Spring Boot, J2EE, REST APIs, SQL, Kafka, Git, CMake

Graphics / Games: OpenGL, SFML, SDL, Unity 3D, Unreal Engine 5.1, Cocos2D-x

Math / CS: Linear algebra, 3D math, trigonometry, operating systems, computer architecture, digital design

ACHIEVEMENTS

- BYOG Game Jam 2021 and 2022: reached top 5 in popularity.
- Brackeys Game Jam 2021: ranked in the top 500 out of 2200 entries.

EDUCATION

Guru Gobind Singh Indraprastha University

Jul 2020 - Jun 2023

Bachelor of Computer Applications · New Delhi, India