

Jatin Jangir

Final Year Postgraduate, Department of Computer Science, Indian Institute of Technology, Kanpur

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Academic Qualifications

Year	Degree	Institute	CPI/%
2024 – Present	M.Tech. (CSE)	Indian Institute of Technology, Kanpur	8.86/10
2019 – 2023	B.E. (CSE)	RCOEM, Nagpur	9.00/10
2019	Maharashtra State Board(XII)	Peoples Jr. College, Yavatmal	78.31%
2017	CBSE (X)	MVM, Yavatmal	93.6%

Work Experience

- **DevOps Engineer, Devtron** (Jan 2023 – July 2024)
Gurugram Internship Certificate 📄 Relieving letter 📄
 - Removed namespace dependencies in installation, enabling **multiple Kubernetes deployments within the same cluster** and improving scalability.
 - Optimized **CI/CD pipelines & Alerting** using GitHub Actions, reducing build and deployment time.
 - Collaborated with enterprise clients to troubleshoot and resolve complex **Kubernetes cluster** issues.
 - Provided consultation on **EKS** and **AKS** cluster upgrades in **Zero Downtime**, improving system performance and security.
 - **Reduced Docker image size by 25%**, lowering storage and deployment time for multiple microservices.
 - Implemented a **log monitoring system** to reduce HTTP 4xx and 5xx errors, improving application reliability.
 - Contributed to **open-source MicroK8s integration** for Devtron, enhancing community adoption.
 - Migrated **monolithic microservice installation scripts** to modular Helm charts, improving maintainability and automation.
 - Deployed a scalable **Kubernetes cluster on Raspberry Pi**, enabling cost-efficient cloud-native deployments.
 - Improved **PostgreSQL migration process** by adding connection validation, retries, and custom iteration.**Technologies Used:** Kubernetes, Docker, Helm, GitHub Actions, PostgreSQL, EKS, AKS, MicroK8s, Raspberry Pi
- **PrimaThink Technologies Pvt. Ltd.** — Web Developer Intern (Remote) (Sep 2021 – Nov 2021)
Technologies Used: HTML, CSS, JavaScript, Bootstrap, TailwindCSS. Internship Certificate 📄

Research Work

- **Improving Data Movement Performance for GPU Workloads** (May 25 – Ongoing)
Thesis under the guidance of Prof. Debadatta Mishra
 - Exploring methods to reduce memory duplication between CPU RAM and GPU memory by enabling **Unified Virtual Memory (UVM)** to directly use pages mapped from files.
 - Identified key limitations, the absence of native file operations on GPU and redundant data copies in Unified Virtual Memory (UVM), leading to inefficient use of system RAM.
 - Analyzing usage scenarios in GPU-accelerated workloads where large datasets are file-backed (e.g., training data, graph datasets), showing potential to **save significant CPU RAM while improving GPU data access**.
 - Outlined future scope, including **integration with CRIU** for GPU checkpoint/restore, extending support to heterogeneous memory systems, and **enabling fine-grained page sharing between CPU and GPU** for high-throughput & HPC applications.**Technologies Used:** Linux Kernel, UVM, CUDA, NVIDIA GPU Driver, C.
- **Enhancing GPU Checkpoint/Restore Functionality in CRIU** 🌐 (Jan 25 – April 25)
Independent Study under the guidance of Prof. Debadatta Mishra
 - Investigated and reproduced results of **CRIUgpu**, a plugin-based extension of CRIU that enables checkpoint/restore of CUDA applications on NVIDIA GPUs.
 - Analyzed **plugin architecture and CUDA runtime interactions**, identifying limitations like GPU memory handling, race conditions, and lack of pre-dump support.
 - Implemented enhancements in CRIU for **pre-dump support for shared memory**, enabling iterative dump in GPU-intensive workloads.**Technologies Used:** C, CRIU, CUDA, NVIDIA GPU Driver, Linux (Ubuntu), Git, Shell Scripting.
- **Analytics of Epidemiological Data using Machine Learning Models** (Jan 22 – May 22)
Research Paper 📄 *Conference Certificate* 📄

Projects

- **Linear Models for Predicting PUF Behavior** 🌐 (Jan 25 – May 25)
Course Project CS771: Introduction to Machine Learning

- Derived a **linear model** to predict the outputs of **Multi-Layer Arbiter PUFs (Physical Unclonable Functions)** and reduced feature dimensionality from 256 to 87 using algebraic simplifications.
- Designed and implemented an **order-8 polynomial kernel SVM** to efficiently compute predictions in high-dimensional feature space.
- Formulated and solved a **constrained optimization problem** to recover individual delay parameters of a 64-stage Arbiter PUF from its linear model.
- Conducted extensive experiments with **Logistic Regression and Linear SVM**, analyzing effects of L1/L2 penalties, regularization strength, and convergence tolerance on accuracy and training time.

Technologies Used: Python, NumPy, Scikit-learn, Optimization Techniques.

• **AmazoLens: Big Data Visual Analytics for e-Commerce** 🌀

(Jan 25 – May 25)

Course Project CS661: Big Data Visual Analytics

- Built an interactive dashboard for Amazon's sales and customer data to **analyze trends, patterns for business growth**.
- Performed **customer segmentation** using RFM analysis to identify groups like Champions, Loyal, and At-Risk customers.
- Implemented **Market Basket Analysis (Apriori, FP-Growth)** to discover frequently co-purchased products and recommend product bundling strategies.
- Conducted **sentiment analysis** on customer reviews to uncover issues and customer opinions and **regional sales visualizations with Folium maps** and performed **sales forecasting** to guide marketing strategies and inventory planning.

Technologies Used: Python, React, D3.js, Scikit-learn, Transformers, Folium, ClickHouse(database).

• **Logminder: Automated Log-based Anomaly Detection** 🌀

(Aug 24 – Nov 24)

Course Project CS685: Data Mining

- Designed an end-to-end pipeline to **detect anomalies in large-scale system logs**, using parsing, semantic embeddings, and machine learning models.
- Built a log parsing system to transform unstructured logs into vector representations.
- Implemented and compared Logistic Regression, Decision Trees, and Feedforward Neural Networks for anomaly detection on the HDFS dataset.
- Developed a scalable backend integrated with **Kubernetes API and Docker**, enabling real-time collection of pod/container logs.
- Stored extracted metrics (error vs. non-error counts) as **time-series data in PostgreSQL**, supporting long-term trend analysis and visualization.
- Created a **Flask-based dashboard with Plotly charts** for interactive monitoring of namespace, container, and time-window specific anomalies.

Technologies Used: Python, Scikit-learn, PostgreSQL, Flask, Plotly, Docker, Kubernetes.

• **Study and Analysis of various Parallel programming Paradigms**

(Aug 24 – Nov 24)

Course Project CS610: Programming for Performance

- Implemented and optimized **GPU parallel algorithms** (2D/3D convolution, stencil computations) using **CUDA shared memory tiling, pinned memory, and UVM**, achieving significant throughput improvements on NVIDIA GPUs.
- Accelerated **CPU-bound computations** (matrix multiplication, prefix sum) with **Intel SIMD intrinsics** and multi-core parallelization via **OpenMP**, applying loop blocking/tiling for cache locality.
- Designed and implemented **concurrent data structures** in C++, including a thread-safe hash table (Pthreads) and a **lock-free stack** (atomic CAS), benchmarked against Intel TBB.
- Identified and resolved **performance bottlenecks** (false sharing, lock contention) in multithreaded applications using **perf and PAPI**, performing detailed microarchitectural cache/memory analysis.

Technologies Used: C++, CUDA, OpenMP, Pthreads, Intel TBB, SIMD (AVX2, SSE4), perf, PAPI

• **Miss-Minutes: AI-Driven Money Management Game** 🌀

(Jul 25 – Ongoing)

Self Project

- Designed an engaging **multiplayer game interface** in **React, Flask(Python), Redis(Database)** that models financial literacy concepts such as savings, Gov. bonds, stocks, index funds, and gold trading.
- Simulated **time-based wealth progression**, where each minute represents a year, with monthly price fluctuations, income cycles, and interest accrual on fixed deposits and bonds.
- Live competition against friends and **AI bots executing strategic trading algorithms**.

Technologies Used: Python, Time-Series Analysis, AI-Agent, HTML, CSS, JavaScript.

• **Namespace-Crawler: Kubernetes Controller** 🌀

(Aug 24 – Nov 24)

Self Project

- Developed a custom **Kubernetes controller** to watch Kubernetes Objects events and take action based on the presence of specific labels.
- Automate the synchronization of resources like Deployments, ConfigMaps and Secrets across multiple namespaces.
- Implemented logic to dynamically handle create, update, and delete events based on custom annotations, significantly **reducing manual configuration** in large environment and ensuring consistency.

- The project is built using Go and relies on the **Kubernetes Client-Go library to interact with the Kubernetes API server.**

Technologies Used: Go, Kubernetes, Docker, YAML.

Technical Skills

- **Languages:** C/C++, Python, GoLang, Bash, SQL
- **Cloud & DevOps:** Kubernetes, Docker, Helm, CI/CD, GitHub Actions, Git, AWS (EKS, EC2), Azure, GCP
- **Systems & HPC:** CUDA, OpenMP, Pthreads, Linux Device Drivers
- **AI/ML & Data Science:** NumPy, Pandas, PyTorch, Tensorflow, Scikit-learn
- **Web & Visualization:** React, Flask, D3.js, Plotly, HTML/CSS, Tailwind CSS, Redis, PostgreSQL

Positions of Responsibility

- Teaching Assistant - CSE, IIT Kanpur
 - **CS771:** Introduction to Machine Learning (Aug 24- Dec 24)
 - **ESC101:** Fundamentals of Computing (Jan 25- Apr 25)
 - **CS330:** Operating Systems (July 25 - Dec 25)
- Dept. Placement Coordinator - SPO, IIT Kanpur (Jun 25- Apr 26)
- Company Placement Coordinator - SPO, IIT Kanpur (Nov 24 -Dec 24)
- Orientation Team Member - ICS IIT Kanpur  (Dec 24 - Jan 25)

Relevant Courses

Data Structure Intro to ML Parallel Algorithms Compiler Design	Programming for Performance Big Data Visual Analytics Computer Architecture Data Mining	Computer Networks Cloud Computing Operating System Special topics in CS *
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* - Independent Study under the guidance of Prof. Debadatta Mishra covering topics over Container Checkpointing and Restoration on GPU.

Achievements

- 🎓 **GATE CSE 2024:** Secured **AIR 236** out of 123,967 candidates.
- 🎓 **GATE DA 2024:** Achieved **AIR 336** out of 39,210 candidates.
- 🎓 **GATE CSE 2022:** Secured **AIR 1766** out of 77,257 students.
- 🏆 **Smart India Hackathon 2022:** Selected as a **National Finalist** from over 200,000 students.
- 🏆 **College Technical Cup 2022:** Secured **First Place** in the annual Inter-Departmental technical quiz competition.
- </> **Leetcode:** Rank **38,609** worldwide. Achieved **25+** badges, including Annual Badge 2022, 500 Days Badge.

Certifications

- AWS Academy Graduate 
- Certified Kubernetes Application Developer (CKAD) Credential-ID: LF-qmi65r51yc 
- Certified Kubernetes Administrator (CKA) Credential-ID: LF-zrrf01xc9i 
- Cisco Cybersecurity Essentials 

Blogs & Articles

- **Securing Kubernetes Production:** Avoid These 11 Common Misconfigurations 
- **Time-Based Scaling** for Kubernetes Deployments 