Parmeet Virdi

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Education

University of Calgary Calgary, AB
Bachelor of Science in Computer Science *Aug. 2022 – Present*

- GPA: 3.7/4.0
- Relevant Coursework: Computer Networks, Distributed Systems, Machine Learning, Computer Vision

Technical Skills

Programming Languages: Java, Python, C, SQL, TypeScript
Backend & Distributed Systems: Java NIO, TCP/IP, Event-Driven Systems, Concurrency, Fault Tolerance, Replication, Leader Election
ML & Computer Vision: PyTorch, scikit-learn, NumPy, Pandas, OpenCV, Albumentations, COCO mAP
Tools & Platforms: Git, Linux, Bash, Docker, Gradle, Maven

Projects

Distributed Fault-Tolerant Chat System | *Java, Java NIO, TCP/IP, Docker, Gradle* Jan 2025 – Apr 2025

- **GitHub:** github.com/Distributed-IRChat
- Built an IRC-style distributed chat system using event-driven Java NIO with selectors and non-blocking channels to multiplex client and peer-server connections without per-connection threads.
- Implemented gossip-based replication with vector timestamps to preserve per-sender ordering under P-RAM consistency and ensure convergence under message duplication and reordering.
- Implemented reliability mechanisms including ACK-tracked write queues, unique message ID deduplication, client reconnect and resend buffering, and disk-backed message persistence for recovery.
- Implemented Bully leader election for Addressing Server failover and validated behavior using Docker with 50 clients, 10 chat servers, and 5 addressing servers, including peer-based log synchronization after failures.

Occluded Pet Detection | *Python, PyTorch, OpenCV, YOLOv8, EfficientDet, DETR* Sep 2025 – Jan 2026

- Designed an occlusion-robust object detection study for indoor cat and dog visibility loss using the Oxford-IIIT Pets dataset with 7,349 images and synthetic indoor-object occlusions from ADE20K.
- Built a data pipeline to derive bounding boxes from segmentation masks and generate controlled synthetic occlusions with minimum overlap constraints to simulate household occluders.
- Trained YOLOv8, EfficientDet-D0, and DETR under fixed training budgets and evaluated on a 74-image real occluded test set using COCO mAP at 0.50 and across 0.50 to 0.95 thresholds.
- Built an evaluation and analysis pipeline to inspect predictions under partial occlusion, including tools to review outputs across occlusion placement, lighting variation, and object geometry.

Genetic Algorithm Hyperparameter Tuner | *Python, scikit-learn, NumPy, pandas* Sep 2024 – Jan 2025

- Built a reusable genetic algorithm framework with population initialization, tournament selection, crossover, mutation, and elitism for tuning scikit-learn models using k-fold cross-validation.
- Achieved up to 150 times faster hyperparameter tuning compared to GridSearchCV while maintaining comparable model accuracy across multiple classifiers.
- Built an experiment harness to compare genetic algorithms against grid search and randomized search under aligned evaluation budgets, tracking best and average fitness per generation.
- Introduced constraint-aware operators for dependent hyperparameters such as Logistic Regression solver and penalty compatibility, reducing invalid configurations to near zero and improving convergence stability.

Experience

Web Developer — Local Restaurant | *WordPress, CSS, DNS, cPanel, GoDaddy* Sep 2025 – Present

- Developed and maintained a production WordPress website, improving layout consistency and mobile responsiveness across key pages and device breakpoints.
- Owned deployment and hosting operations including domain and DNS configuration, SSL setup, cPanel administration, and production updates to ensure reliability and maintainability.
- Implemented operational safeguards such as backups, security hardening, and plugin configuration to reduce downtime risk and simplify long-term maintenance.