

# SIDDHARTHA CHOUDHARY

Full Stack AI Engineer

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## WORK EXPERIENCE

Spherica Jewelry LLC, Toronto, Canada

Dec 2023 – Mar 2025

Artificial Intelligence Researcher

- **50% reduction in jewelry design iteration time** by designing and training a custom **Generative Adversarial Network (GAN)** for AI-driven pattern generation.
- **30% improvement** in GAN output quality by **preprocessing high-resolution** jewelry images (metal rings) with image augmentation techniques using TensorFlow.
- Integrated GAN-generated jewelry designs into an e-commerce platform, increasing **customer engagement** by **30%**.
- Enhanced diversity and quality of AI-generated designs by integrating Stable Diffusion API alongside GANs.
- **99.8% uptime achieved** in large-scale data engineering pipelines for image preprocessing (resizing, normalization, augmentation).
- Managed the end-to-end ML lifecycle, including model training, deployment, monitoring, and continuous optimization using **Docker, Kubernetes, and CI/CD pipelines**.
- **4x faster** training achieved by utilizing **external GPUs**, reducing model training significantly.
- 99% reduction in API response latency by implementing a **Flask-based back-end API** with **Cross-Origin Resource Sharing (CORS)** for seamless AI model communication.
- **100% real-time interactivity** enabled by developing a **WebGL-powered front-end UI** in Unity3D.
- 95% inference request efficiency attained by establishing a client-server protocol for AI model interactions.
- 20% increase in model stability through **checkpoint-based model saving** and automated training workflows, improving reproducibility.

Rythmos, Hyderabad, India

May 2019 – Jul 2022

Associate Consultant

- Debugged and authored bug fixes in the Unity Particle System and other core modules, improving **stability and performance by 30%**.
- Contributed to the Unity Gaming Platform source code, resolving **98% of reported bugs** across all release versions, including Long-Term Support (LTS) versions.
- Adapted to large, unfamiliar Unity codebases, efficiently handling and backporting bug fixes in IL2CPP and Mono scripting backends, achieving a **90% resolution success rate**.
- Engineered **adaptive difficulty AI-driven mechanics** using **Unity ML-Agents Toolkit**, optimizing player engagement.
- Developed **AI-assisted procedural content generation** using reinforcement learning and rule-based AI for dynamic level design and asset placements.
- Designed and integrated **50+ automated tests**, achieving a **95% test success rate** across Play mode, Edit mode, Integration, Graphics, and Performance tests.
- Utilized **NUnit, UnitTest++**, and Katana CI/CD pipelines, improving **testing efficiency by 40%**.
- Worked in an **Agile development** environment, participating in stand-ups, code reviews, and mentoring new team members to enhance productivity and performance.
- Authored technical documentation for code modules, features, and API usage.

## EDUCATION

Ontario Graduate Certificate in Artificial Intelligence with Machine Learning

2023 – 2024

- Courses: Advanced Deep Learning, NLP, Computer Vision, Machine Learning in Cloud Computing

Ontario Graduate Certificate in Enterprise Software Development

2022 – 2023

Bachelor of Technology in Computer Science Engineering

2015 – 2019

## PROJECTS

Cubic Run (<https://github.com/siddhurch/Cubic-Run>)

May 2024 - Present

- **35% performance improvement** by resolving threading and deadlock issues through **memory and frame optimizations**.
- AI-powered game bot with 30% enhanced efficiency, using Unity ML-Agents, behavior trees, and reinforcement learning for obstacle avoidance and strategic movement.
- **Google Play Games integration**, enabling seamless **authentication, authorization**, and leaderboard management via Unity Cloud.
- Real-time multiplayer development using **Photon Fusion**, ensuring **low-latency synchronization**.
- **Accelerometer-based touch controls** for enhanced mobile gameplay experience.
- Physics-based collision handling & explosion effects, with **event-driven** health reduction mechanics.

## Enhancing Vegetation and Land Cover Classification Accuracy (<https://github.com/siddhuc/Enhancing-Vegetation-and-Land-Cover-Classification-Accuracy>) Jan 2024

- Developed a supervised & unsupervised learning framework using **Random Forest, XGBoost, and K-Means Clustering** to classify vegetation and land cover types.
- Preprocessed and cleaned over **100,000+ geospatial data points**, handling cloud cover noise and inconsistencies in **OpenStreetMap** annotations.
- **Optimized feature selection**, reducing input **feature dimensionality by 35%** using Principal Component Analysis (PCA) while retaining classification accuracy.
- Reached **96.35% classification accuracy** with XGBoost, outperforming Random Forest (93.2%) and K-Means clustering (**silhouette score: 0.8535**).
- **Fine-tuned hyperparameters** using **GridSearchCV**, leading to an 8% reduction in classification errors and improved model robustness.
- Achieved a precision of 94.8% and recall of 95.2%, ensuring high reliability in vegetation classification.

## PDF Summary Generator (<https://github.com/siddhuc/PDF-Summary-generator>) Mar 2024

- Designed and implemented an **AI-powered document processing tool** utilizing OpenAI's GPT models and **LangChain** to enable automated language detection, summarization, and translation.
- Integrated **Streamlit** and **Gradio** for an interactive user interface, enabling seamless PDF uploads, real-time processing, and multilingual output visualization.
- Developed a structured translation module that translates the generated summary between English and French using a **Pydantic-based structured output approach**.
- Optimized document loading and parsing by leveraging **DirectoryLoader** and **PyPDFLoader**, ensuring efficient extraction of text from uploaded PDFs.

## SKILLS

- **Programming & Development:** Python, C#, Java (Spring Boot, Hibernate)
- **ML-Ops & DevOps:** Docker, Kubernetes, CI/CD, MLFlow
- **Cloud & Microservices:** Unity Cloud, AWS (S3, EC2, Lambda), Google Cloud AI, RESTful APIs, Microservices
- **Databases:** MySQL, MongoDB
- **Tools & IDEs:** Jupyter, Google Colab, Jira, GitHub, Mercurial, IntelliJ IDEA, Visual Studio, VS Code
- **Machine Learning & AI:** AutoML frameworks, Scikit-learn, NLP, Computer Vision, Feature Engineering
- **Libraries:** Pandas, NumPy, OpenCV
- **Data Visualization:** Matplotlib, Seaborn, Tableau

## CERTIFICATION

### Spring Boot 3, Spring 6 & Hibernate (Udemy) Mar 2025

- Skills: Spring Boot 3, Spring 6, Hibernate, Spring Core, Spring REST, Spring MVC, Spring Security, Thymeleaf, JPA, MySQL, Java, Maven.

## AWARDS & ACHIEVEMENTS

### Amazon AWS DeepRacer Competition Apr 2024

#### FIRST PLACE

- Clocked fastest lap time of 9.4 seconds, leading Team **EvolveML** to 1st place.
- Developed **reinforcement learning models** to train an autonomous race car.