# Houfu Chen

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## Summary

- Machine Learning Engineer with teaching experience in three undergrad/grad level AI (Artificial Intelligence) and Python courses, plus hands-on experience in operationalizing ML (Machine Learning) models, developing ML pipelines, and automating workflows.
- Featured Alumini in UofT MEng ML & Analytics Emphasis, strong data science and leadership skill.
- Experienced in deploying models in Agile production environments and optimizing their performance.

## Work Experience

**Teaching Assistant (Machine Learning & Python)**                01/2024 – Present
*University of Toronto*                                                          *Toronto, ON*

- Design and implement ML pipelines covering Feature Engineering, Advanced Analytics, K-Means, KNN, SVD, PCA, Neural Networks, and Gradient Descent.
- Evaluate and optimize machine learning models to ensure optimal performance and scalability.
- Mentored and provided guidance for students on ML concepts and techniques, demonstrating clear communication of complex technical material.

**QA-Dev (Multiple Companies)**                                          01/2020 - 08/2022
*Ford Motor; Imagine Communications; Teranet; Manulife*        *Waterloo, Mississauga & Oakville, ON*

- Deployed and operationalized automated testing systems, improving reliability by 10% and test coverage by 30%.
- Implemented DevOps pipelines with Git, automated testing, and code scanning technologies.
- Fixed SonarQube issues achieving 98% test coverage and developed BDD test scenarios.
- Built and maintained scalable infrastructure for UI automation frameworks and server health monitoring.

## Projects

**AI Facial Emotion Analysis System**                                          03/2025
*MLOps Implementation; Associate Machine Learning Engineer*                      *GitHub*

- Innovated end-to-end ML pipeline for facial analysis using DeepFace and MediaPipe with automated deployment.
- Created & deployed model endpoints for consistent contextual scene analysis and emotion correlation with high accuracy.
- Implemented ML model monitoring and versioning system with real-time performance metrics.

**Emergency Route Planner Framework**                                09/2024 – Present
*ML Pipeline Development; Machine Learning Engineer*                            *Toronto, ON*

- Built production-ready evacuation routing system using ML algorithms and LLM-based decision-making.
- Implemented ML infrastructure with agent-based simulations (OctoTools) and optimization tools.
- Developed CI/CD pipeline for continuous model improvement and deployment.

**ML Personal Projects**                                                       2024 - 2025
*MLOps and Model Deployment; Machine Learning Engineer*                          *GitHub*

- Reinforcement Learning (2024): Designed and deployed RL agent with monitoring and performance metrics.
- Financial Tool (2024): Built and operationalized LLM-powered financial service analysis tool.
- Food-Raccoon (2024): Implemented production ML pipeline for restaurant recommendation system integrating LLMs with location APIs.

## Skills

**Programming Languages:** Python, SQL, C, C++, C#, JavaScript, HTML

**ML/AI Tools:** TensorFlow, PyTorch, Scikit-learn, Large Language Models (LLMs), DeepFace, MediaPipe

**Data Engineering:** Pandas, NumPy, ETL pipelines, Spark, Data Factory, Databricks

**MLOps & DevOps:** Git, Docker, Kubernetes, Jenkins, Azure ML, Model Monitoring, Versioning, Lifecycle Management

**Cloud & Infrastructure:** Azure Stack, Google Cloud Platform, Linux, Cloud-native Architecture

## Education

**University of Toronto (Graduated in 03/2025)**        Master of Engineering in Electrical & Computer Engineering
**University of Waterloo (Graduated in 06/2023)**        Bachelor of Applied Science in Nanotechnology Engineering

## Certifications

**Stanford Algorithm & Data Structures Certification (01/2025)**

**Stanford & DeepLearning.AI - Machine Learning Specialization (03/2025)**