Jaspreet Singh Kalsi

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SUMMARY

AI Engineer with over 5 years of experience designing and deploying scalable, AI-driven systems. Expert in building GenAI and LLM-based applications, AI agents, and natural language processing tools using Python, LangChain, FastAPI, PyTorch, and TensorFlow. Proven success delivering secure, accessible, and high-performance applications in both government and private sectors. Strong background in cloud deployment (AWS, Azure), WCAG compliance, prompt engineering, and vector databases. Passionate about building AI tools that solve real-world problems and improve decision-making.

SKILLS

- **Languages: Python, JavaScript, TypeScript, HTML5, CSS3**
- **AI/ML Tools: PyTorch, TensorFlow, LangChain, LangGraph, LangSmith, MLflow, Numba, HuggingFace Transformers**
- **AI Domains: LLMs, AI Agents, NLP, Computer Vision, Deep Learning, Prompt Engineering**
- **Frameworks & Libraries: Flask, FastAPI, React, Angular, Node.js**
- **Databases: Chroma, Faiss, PostgreSQL, MySQL, MSSQL**
- **Cloud Platforms: AWS (S3, EC2, Lambda), Azure (Microsoft Graph API), Docker**
- **Other Tools: Git, Celery, JWT, QnAMaker, WCAG Compliance, Linux**
- **Methodologies: Agile, DevOps, Distributed Systems, RESTful APIs, Microservices**

WORK EXPERIENCE

Government of Canada

Web Communications Advisor - Canadian Transportation Agency(CTA)   **Apr 2025 - Present**
- Led design and deployment of **LLM-powered chatbot** to simplify air travel complaint processes.
- Integrated **AI tools for text summarization**, classification, and knowledge extraction using LLMs.
- Conducted accessibility audits and resolved WCAG compliance issues.
- Developed WCAG-compliant web apps and internal automation tools, reducing steps by 42%.

Technical Lead - Immigration, Refugees & Citizenship Canada(IRCC)   **Feb 2024 - Dec 2024**
- Led development of **WCAG-compliant web applications**, enhancing accessibility for millions of users.
- Automated repetitive tasks, reducing process steps by 30% and improving team efficiency.
- Collaborated on **responsive web system design**, ensuring seamless cross-device functionality.
- Provided **technical leadership** and **mentorship** on best practices for **system design** and **development**.
- Ensured project adherence to **regulatory compliance** and **technical standards**.

Senior IT Developer - Canada Revenue Agency(CRA)   **Oct 2023 - Feb 2024**
- Enhanced **chatbot functionality** using **Angular** and **AWS**, reducing query response times by 25%.
- Implemented new **chatbot features** based on management specifications, increasing user engagement by 30%.
- Contributed to **scalable, AI-driven infrastructure** for the CRA website's chatbot.
- Technologies used: **Angular**, **AWS**(S3, EC2, Lambda), **QnAMaker**, **Docker**.

Freelance Software Engineer   **Aug 2024 - Present**
- Developed full-stack apps and integrated **AI-driven insights using LLMs and LangChain**.
- Built NLP-enabled platforms to improve client decision-making and customer experience.
- Delivered up to 40% performance gains through AI optimization in client projects.

Computer Vision Scientist - Enphase Energy, Montreal   **Apr 2019 - Apr 2023**
- Built deep learning models for **roof outline detection, trees detection**..
- Optimized **computational pipelines** for **LiDAR data processing**, reducing processing time by 60%.
- Designed **AI-powered models** for **roof outline**, **surface**, and **tree detection**, achieving 95% accuracy.

● Mentored junior team members in **deep learning projects**, enhancing team productivity.

Web Design Instructor - CDI College, Montreal   **Aug 2019 - Dec 2021**
● Developed and delivered **web design curriculum**, incorporating **HTML5**, **CSS3**, **JavaScript**, and **jQuery**.
● Supervised student projects, provided feedback, and facilitated hands-on learning.

MEAN Stack Developer - OnGraph Technologies Limited   **Dec 2015 - June 2017**
● Developed software using various **programming languages** and **technologies**.
● Participated in **Agile development processes** and contributed to project milestones.

PROJECTS
GenAI Projects
● **Chatbot-q-and-a**: **LLM-powered** conversational agent using **LangChain** and **vector search** over **custom documents**: https://github.com/js-kalsi/chatbot-q-and-a
● **Restaurant-genai**: **AI assistant** for **restaurant planning** with **food recommendations** and **reservation features** via **LLMs**: https://github.com/js-kalsi/restaurant-genai
● **Text2SQL**: Converts **natural language questions** to **SQL queries** using an **LLM** and **schema-aware prompt templates**: https://github.com/js-kalsi/text2SQL

SimcoeMeats Factory Automation Project
● Developed a **Full-stack factory management platform** (**Angular**, **Flask**, **JWT**, **TypeScript**, **MySQL**) for factory operations, featuring **secure session management** and **role-based access** (Entry/Office modes).
● Planned **AI-driven** enhancements: **demand prediction** and **LLM-powered natural language queries**.

IRCC Internal Client's Projects:
● Designed and implemented **WCAG-compliant web pages** for immigration policy launches (**WET**, **JavaScript**, **jQuery**, **HTML5**, **CSS3**, **Adobe Experience Manager**, **Git**).
● Automated internal tools, reducing task completion time by 25%.

CRA Chatbot:
● Improved **chatbot functionality** through **AI integration** and **scalable infrastructure** (**Angular**, **AWS**: S3, EC2, Lambda, **QnAMaker**, **Docker**), significantly reducing user wait times.

Object Detection Applications:
● Developed **deep learning models** for **building outline**, **roof surface**, and **tree detection**, achieving 95% accuracy (**Python**, **PyTorch**, **Flask**, **Docker**, **AWS S3**, **PostgreSQL**).

Roof and Panel Shading Pipeline:
● Reduced shading analysis time from 5 min to 30 sec using task queue architecture.
● Tech: Python, Flask, Celery, Numba, PVWatts-Tool.

LiDAR Conversion Pipeline:
● Engineered a **scalable LiDAR data preprocessing pipeline** using **distributed systems** (**Python**, **Flask**, **Celery**, **React**, **Docker**).

EDUCATION
Masters of Applied Science in Information Systems Security   **2017- 2019**
Concordia University, Montreal, Quebec
Thesis: Color Image Segmentation By Integrating Spatial Information Using Semi-Bounded Finite Mixture Models

RESEARCH PAPERS
● **Color Image Segmentation Using Generalized Inverted Finite Mixture Models By Integrating Spatial Information:** https://ieeexplore.ieee.org/document/8781499
● **Color Image Segmentation Using Semi-bounded Finite Mixture Models by Incorporating Mean Templates:** https://link.springer.com/chapter/10.1007/978-3-030-23876-6_12