

ALI JAHANI

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https://jahaniam.github.io/

SUMMARY

- 5+ years of industry experience in **machine learning**, **mlops**, and **computer vision**. I love leading innovative projects and staying up to date with the latest industry trends and research.
- I enjoy production quality coding, developing large-scale training pipelines, and deploying ML solutions in production

EXPERIENCE

Senior Software Developer

Oct 2022 - Dec 2023

Avidbots Corp., Kitchener, ON (Autonomous Cleaning Robots)

- Building **Machine Learning Platform** to facilitate the ML projects lifecycle at Avidbots e.g. smart data collection, ETL pipelines, monitoring, training and model evaluation, experiment tracking, and model deployment
- Built a data-lake and CI/CD ETL pipelines for our robot fleet for machine learning projects
- Designed and implemented Personal Identifiable Information Removal package for GDPR compliancy and privacy
- *Technologies: AWS (EKS, EMR, EC2), Dagster, ROS, Tensorflow, Pytorch, Docker, Opencvino, Apache Spark, Terraform, Kubernetes, Bitbucket Pipelines, Neptune, mlflow, Apache Iceberg*

Software Developer

Apr 2020 - Oct 2022

Avidbots Corp., Kitchener, ON (Autonomous Cleaning Robots)

- **Semantic Segmentation Tech Lead** - Deployed **Avidbots' first ML model in production** on our robots
- Performed various pruning and quantization techniques to improve model inference speed by up to 90%
- Implemented **semi weakly supervised** training to boost performance by 3%
- Designed and implemented **active learning** based image selection for an **auto annotation** tool using U^2 Net
- Led mentorship of mitacs interns and provided L&L talks for new industry trends on AI
- *Technologies: Tensorflow, Pytorch, Docker, Opencvino, Streamlit, ROS, Flatland Simulation, Nvidia ISAAC, Python, C++, OpenCV, Pandas, MongoDB, CVAT*

Computer Vision Engineer

Sep 2019 - Mar 2020

Dot Technology Corp., Edmonton, AB (Autonomous Tractors for Broadacre Farming)

- Developed a 3D farm Simulator for fast prototyping and synthetic dataset collection
- Fine-tuned state-of-the-art semantic segmentation and object detection models for a semi-auto annotation tool
- *Technologies: Python, C++, Unreal Engine, Tensorflow, Pytorch, Detectron2, OpenCV, ROS, Carla*

Research & Teaching Assistant

Sep 2016 - Aug 2019

University of Alberta, Edmonton, AB

- Used LiDAR and Stereo images (semi-supervised) to improve state of the art single-image depth estimation accuracy by ~3%
- Integrated deep learning depth estimation with SLAM to recover scale and improve accuracy and robustness
- *Technologies: Python, Tensorflow, Pytorch, OpenCV, ROS*

3D Game Developer Intern

Nov 2017 - Sep 2018

vrCAVE - Edmonton, AB

- Implemented **rule-based AI agents** and in-game hint system in multiplayer virtual reality escape room games
- *Technologies: Git, HTC VIVE, Unreal Engine*

EDUCATION

MSc, Computer Science (University of Alberta, AB)

Sep 2016 - Aug 2019

Thesis: **Semi-Supervised Single Image Depth Estimation Using Deep Neural Network**

BSc, Electrical Engineering (University of Tehran, Tehran)

Sep 2011 - May 2016

Thesis: **Real-time Video Stabilization and Mosaicing**

SKILLS

Programming: Python (6+ years), Modern C++ (Proficient)

ML/DL Tools: Pytorch, Tensorflow, Opencv, Keras, Nvidia triton, Scikit-learn, Intel CVAT, MLflow, Neptune, W&B, Langchain

MLOps/DevOps: Dagster, Docker, AWS Sagemaker, MLflow, Streamlit, Flask, FastAPI, Terraform, Kubernetes, Bitbucket Pipelines, Github actions

Cloud: AWS (EKS, EMR, EC2, S3, Sagemaker, cognito)

Big Data Analysis Frameworks and Databases and Tables: MongoDB, MySQL, MariaDB, Sqlite3, PySpark, Pandas, DuckDB, MotherDuck, Apache Iceberg, Apache Parquet, CockroachDB, Pinecone Vector database

Robotics, Computer Vision: ROS, Open3d, OpenCV, Unreal Engine, Nvidia ISAAC Sim, Flatland Simulation

PUBLICATIONS & PATENTS

- *System and Method of Semantic Segmentation for a Cleaning Device*
Ali Jahani, Egor Bredikhin, Adel Fakh (Submitted to US Patents, Avidbots Corp. 2023)
- Unsupervised Stereo Matching with Surface Normal Assistance for Indoor Depth Estimation
Xiule Fan, Ali Jahani, Baris Fidan, Soo Jeon (Submitted to MDPI Sensors 2023)
- *Semi-Supervised Monocular Depth Estimation with Left-Right Consistency Using Deep Neural Network*
A Jahani, SY Loo, and H Zhang (ROBIO 2019 **Best Conference Paper Award**) [PDF] [Source Code] [Demo]
- *CNN-SVO: Improving the Mapping in Semi-Direct Visual Odometry Using Single-Image Depth Prediction*
SY Loo, A Jahani, S Mashohor, SH Tang, and H Zhang (ICRA 2019) [PDF] [Source Code] [Demo]
- *Real-time video stabilization and mosaicking for monitoring and surveillance*
A Jahani, H Moradi (ICROM 2016) [PDF] [Source Code] [Demo]

SELECTED PROJECTS

Retrieval Augmented Generation for Law

- A Framework to get answers of a law question based on a public database of court cases. It performs similarity search on pinecone vector database and generate answers based on top matching cases using GPT4.
- *Technologies:* OpenAI embedding, GPT4 API, Pinecone, Langchain, Streamlit

Simple ML-Pipeline [Source Code]

- An **ml-pipeline** with supports for **large-scale training**, **hyperparameter tuning**, CI/CD tests, and model endpoint deployment, cloud/local deployment, and experiment tracking.
- *Technologies:* AWS Sagemaker, **Nvidia Triton Server**, Weights and Biases, Github Actions, Keras

MyAIPanel.com

- An AI-based app designed to help small businesses in their advertising on Telegram
- Schedules automated messages to different groups of interests in Telegram
- Telegram Listener, i.e. uses LLM/ChatGPT to analyze chats that are related to the business of interest and notifies them

Crop Growth Stage Classification [blog] [Demo]

Finalist Group @ATB DATATHON, Edmonton

- Developed and demoed real-time deep neural network to classify the growth stages of the crop to help farmers
- *Technologies:* Python, Tensorflow, Keras, Scikit-learn, OpenCV

Image Segmentation of Choroideremia Disease [PDF]

Machine Learning Course

- Implemented ML algorithms such as SVM, Random Forest, UNet for pixel-wise classification of retina images