ALI JAHANI

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SUMMARY

- Senior software developer with expertise in **machine learning**, computer vision, and robotics. I enjoy leading innovative projects and staying up to date with the latest industry trends and research.
- A proven track of developing and deploying ML solutions in production

EXPERIENCE

Senior Software Developer - Machine Learning Oct 2022 - Present
Avidbots Corp., Kitchener, ON

- Building **Machine Learning Platform** to facilitate the ML projects lifecycle at Avidbots e.g. smart data collection, monitoring, training, experiment tracking, and model deployment
- Built a data-lake for our fleet to be used for future machine learning projects
- Designed and implemented Personal Identifiable Information Removal package for GDPR compliancy
- *Technologies: Dagster, ROS, **Tensorflow**, **Pytorch**, Docker, Openvino, Apache Spark, Terraform, Kubernetes, Bitbucket Pipelines, Neptune, Apache Iceberg,*

Software Developer - Perception Apr 2020 - Oct 2022

- **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
  *Technologies: **Tensorflow, Pytorch, Docker**, Openvino, Streamlit, ROS, Flatland Simulation**,** Nvidia ISAAC, Python, C++, OpenCV, Pandas, MongoDB, CVAT*

Computer Vision Engineer Sep 2019 - Mar 2020
Dot Technology Corp., Edmonton, AB

- 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*

SKILLS

Programming: Python (6+ years), Modern C++ (Proficient)
ML/DL Tools: Pytorch, Tensorflow, Openvino, Keras, Nvidia triton, Scikit-learn, Intel CVAT, MLflow, Neptune, W&B
MLOps/DevOps: Dagster, Docker, AWS sagemaker, MLflow, Streamlit, Flask, FastAPI, Terraform, Kubernetes, Bitbucket Pipelines, Github actions
Big Data Analysis Frameworks and Databases: MongoDB, MySQL, MariaDB, Sqlite3, PySpark, Pandas
Robotics, Computer Vision: ROS, Open3d, OpenCV, Unreal Engine, Nvidia ISAAC Sim, Flatland Simulation

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PUBLICATIONS & PATENTS

- *System and Method of Semantic Segmentation for a Cleaning Device*
  Ali Jahani, Egor Bredikhin, Adel Fakih (Submitted for US Patents, Avidbots Corp. 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]*

EDUCATION

MSc, Computer Science Sep 2016 - Aug 2019
University of Alberta, Edmonton, AB
*Thesis: **Semi-Supervised** Single Image Depth Estimation Using Deep Neural Network*

BSc, Electrical Engineering Sep 2011 - May 2016
University of Tehran, Tehran
Thesis: Real-time Video Stabilization and Mosaicing

SELECTED PROJECTS

Retrieval Augmentatied Generation for Law
- A Framework to get answers of a law question based on a public database of court cases
- *Technologies*: OpenAI embedding, Pinecone, Langchain, Streamlit

Simple ML-Pipeline *[Source Code]*
- An **ml-pipeline** for digit classification example with supports for CI/CD, cloud/local deployment, experiment tracking, large scale training , and hyper parameter tuning.
- *Technologies*: AWS Sagemaker, Nvidia Triton Server, Weights and Biases, Github Actions, Keras

MyAIPanel.com
- A telemarketing AI-based app for small businesses designed to help them in their advertising on Telegram
- Schedules automated messages to different groups of interests in Telegram
- 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*

2DGrid Mapping and Navigation using Monocular Camera *[Demo]* Robotics Course
- Improved state-of-the-art ORBSLAM 2 framework for navigation tasks
- *Technologies: C++, ROS*

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