ALI JAHANI

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EXPERIENCE

Software Developer - Perception   Apr 2020 - Present
Avidbots Corp., Kitchener, ON

- **Semantic Segmentation Tech Lead** - Deploying Avidbots' first ML model in production
- Designed and implemented ML lifecycle pipelines e.g. data collection, annotation, training, testing, and monitoring
- 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 an **auto annotation tool** using U^2 Net
- Implemented **active learning** based image selection for annotation
- *Technologies: **Tensorflow, Pytorch, AWS, Docker**, Openvino, Streamlit, ROS, Flatland Simulation, Nvidia ISAAC, Python, C++, OpenCV, Pandas, MongoDB*

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

- Developed a 3D farm Simulator for fast prototyping and synthetic dataset collection
- Collected dataset in fields for combine object detection
- Fine-tuned state-of-the-art semantic segmentation 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 (as **supervised**) and Stereo images (as **unsupervised**) to improve state-of-the-art single image depth estimation accuracy by ~3%
- Proposed new evaluation based on cleaned ground truth LiDAR
- Integrated **deep learning depth estimation** with SLAM to recover scale and improve accuracy and robustness
- Taught *Introduction to Computing Science* to non-computer science students
- *Technologies: Python, Tensorflow, Pytorch, OpenCV, ROS*

3D Game Developer Intern   Nov 2017 - Sep 2018
vrCAVE - Edmonton, AB

- Implemented a rule-based AI and in-game hint system in multiplayer virtual reality escape room games
- Pitched and implemented new successful ideas**,** e.g. destructible meshes
- Performed various profiling and optimizations to reach 90 fps
- Created wiki manual documentation for customers
- *Technologies: Git, HTC VIVE, **Unreal Engine***

SKILLS

Programming: Python (4+ years), Modern C++ (Proficient)
ML/DL Tools: Pytorch, Tensorflow, Openvino, Keras, Scikit-learn, Intel CVAT, MLflow
Database: MongoDB, MySQL, Pandas
Robotics, Computer Vision: ROS, Open3d, OpenCV, Unreal Engine, Nvidia ISAAC Sim
Optimization and Numerical Analysis: Numpy, g2o, Scipy
Visualization: Streamlit, Rviz, Matplotlib, OpenGL, PowerBI, Plotly
Others: AWS, Git, Docker

PUBLICATIONS

- *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

Relevant Coursework: **Deep Learning**, **Machine Learning**, **Computer Vision**, **Computer Graphics**, Robotics
Thesis: Semi-Supervised Single Image Depth Estimation Using Deep Neural Network

BSc, Electrical Engineering   Sep 2011 - May 2016
University of Tehran, Tehran

Relevant Coursework: Advanced Programming, Linear Algebra, Engineering Probabilities and Statistic
Thesis: Real-time Video Stabilization and Mosaicing

SELECTED PROJECTS

Crop Growth Stage Classification *[blog] [Demo]*   **Finalist Group** @ATB DATATHON, Edmonton (2019)

- Developed a real-time deep neural network to classify the growth stages of the crop to help farmers
- Performed a live demo on the stage
- *Technologies: Python, Tensorflow, Keras, Scikit-learn, OpenCV*

2DGrid Mapping and Navigation using Monocular Camera *[Demo]*   Robotics Course (2017)

- Improved state of the art ORBSLAM 2 framework for navigation tasks
- *Technologies: C++, ROS*

Direct Sparse Odometry vs ORB-SLAM *[Demo]*   Computer Vision Course (2017)

- Compared direct and indirect methods in Simultaneous Localization and mapping algorithms
- *Technologies: C++, ROS*

Image Segmentation of Choroideremia Disease *[PDF]*   Machine Learning Course (2016)

- Implemented ML algorithms such as **SVM, Random Forest, UNet** for pixel-wise classification of retina images
- *Technologies: Python, MATLAB, Caffe*

CERTIFICATES

- **Sensor Fusion** NanoDegree (Udacity) [In Progress]
- Deep Learning Specialization (deeplearning.ai on Coursera)
- C++: Advanced topic (Linkedin)