ALI JAHANI

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EXPERIENCE

Computer Vision Scientist Sep 2019 - Present
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, Tensorflow, Pytorch, Detectron2, OpenCV, ROS, Carla, UE4*

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
- *Technologies: Git, HTC VIVE, Unreal Engine 4*

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 Statistics
Thesis: Real-time Video Stabilization and Mosaicing

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]*

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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
- Finalist group (top 6 out of 42)
- *Technologies: Python, Tensorflow, Keras, Scikit-learn, OpenCV*

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

- Improved state-of-the-art ORBSLAM2 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
- Due to small dataset size, achieved good results by using bagging methods
- *Technologies: Python, MATLAB, Caffe*

SKILLS

Programming: Python (4+ years), Modern C++ (Proficient)
ML/DL Tools: Tensorflow, Pytorch, Scikit-learn
Robotics and Computer Vision: ROS, OpenCV, Carla, Unreal Engine
Optimization and Numerical Analysis: g2o, Scipy, Numpy
Visualization: PowerBI, Plotly, Matplotlib, OpenGL
Database: MySQL, Pandas
Others: Git, Docker

CERTIFICATES

Deep Learning Specialization (deeplearning.ai on Coursera) Mar 2019

- Neural Networks and Deep Learning
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
- Structuring Machine Learning Projects
- Convolutional Neural Networks
- Sequence Models

VOLUNTARY

- ICRA2019, IROS2017, and AI-GI-CRV2017 conferences
- Leader of convocation video clips teams