Patrick Youssef

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Education

University of Califonia, San Diego   Mar. 2022
Master of Science, Computer Science   *La Jolla, CA*

- GPA 3.95/4.0; Deep Learning and Robotics Focus
- **Relevant Coursework:** Graduate Algorithm Design & Analysis, Computer Networks, Recommender Systems & Web Mining, Advanced Computer Vision, Deep Visual Learning, Robotic State Estimation, Probabilistic Reasoning, Ethics of Data Science

University of California, Irvine   Mar. 2020
Bachelor of Science, Mechanical Engineering   *Irvine, CA*

Skills

- **Programming:** Python, JavaScript, HTML, CSS, MATLAB, R, C++
- **Technologies:** NumPy, MatplotLib, Pandas, PyTorch, OpenCV, Keras, TensorFlow, Gatsby, Git, Linux
- **First Principles:** Machine Learning, Numerical Methods, Linear Algebra, Optimization, Algorithms

Work Experience

SpaceX   Jun. 2019 – Aug. 2019
Software Engineering Intern   *Hawthorne, CA*

- Overhauled Crew Dragon's flight simulation pipeline to enable full launch-to-land simulations and reduce update time by 70%
- Automated updating 500+ legacy configurations to utilize the new pipeline while cleaning out deprecated simulations
- Executed functional and regression testing on 10+ critical verification simulations to ensure the changes had no adverse affects
- Improved constraint checking architecture to enable multi-channel constraints that reduced configuration errors by 80%
- Implemented Python statistics scripts on the cluster to accumulate 100+ performance metrics checked against mission constraints

SpaceX   Mar. 2019 – Jun. 2019
Vehicle Engineering Intern   *Hawthorne, CA*

- Developed computer vision software to automate critical vehicle component inspection with 50% fewer errors in 20% the time

Projects

Neural Radiance Fields (NeRF)   Present

- NeRF model in PyTorch with modern changes and comparing the results to those from the original paper and custom rendered data
- Distributed training of the model using HuggingFace tools on Lambda Cloud with a YAML configuration structure for different jobs

Roadway Segmentation   Jun. 2021

- Semantic segmentation on CityScapes implemented with PyTorch using a modified U-Net with ImageNet based transfer learning
- The usage of transfer learning and modified model parameters yielded a 50% reduction in loss and 30% higher pixel accuracy

Deep Grayscale Image Colorization   Mar. 2021

- Self-supervised grayscale image colorization on Places365 using a multi-head pre-trained and custom feature convolutional network
- Implemented a LAB color space conversion to enable easily scalable self-supervised learning with simple colorized images

Personal Website - PatrickYoussef.com   Jun. 2020

- Project portfolio, blog, first step into web development, and general home on the web to help share and present interesting topics
- Built using GatsbyJS, React, 20+ custom components, and MDX to help make the site easy to work with and expand for new content

Other Experience

HyperXite Design Project   May. 2018 – Mar. 2020
Systems & Software Lead   *Irvine, CA*

- Managed 30+ members in system trade studies, vehicle software, and development of high-fidelity Python/Simulink simulations

FIRST Robotics Team 3476   Jun. 2017 - Mar. 2020
Technical Mentor   *Irvine, CA*

- Coached 20+ students in classical computer vision, control theory, and mechanical design to build a top 1% competing robot

Introductory MATLAB Course - UC Irvine   Sep. 2017 – Dec. 2019
Undergraduate Teaching Assistant   *Irvine, CA*

- Conducted biweekly office hours, wrote/proctored exams, and revised homework/challenge assignments over 3 course terms