

# Patrick Youssef

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[github.com/patrickyoussef/](https://github.com/patrickyoussef/)

[patrickyoussef.com](http://patrickyoussef.com)

## Education

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### University of California, San Diego

*Master of Science, Computer Science*

Mar. 2022

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

*Bachelor of Science, Mechanical Engineering*

Mar. 2020

Irvine, CA

## Skills

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- **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

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### SpaceX

*Software Engineering Intern*

Jun. 2019 – Aug. 2019

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

*Vehicle Engineering Intern*

Mar. 2019 – Jun. 2019

Hawthorne, CA

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

## Projects

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### 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

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### HyperXite Design Project

*Systems & Software Lead*

May. 2018 – Mar. 2020

Irvine, CA

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

### FIRST Robotics Team 3476

*Technical Mentor*

Jun. 2017 - Mar. 2020

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

*Undergraduate Teaching Assistant*

Sep. 2017 – Dec. 2019

Irvine, CA

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