Leron Julian

LeronJulian.github.io | LeronJulian@Hotmail.com | 321-948-8779

Research Interests

Computer Vision, Computational Photography, Machine and Deep Learning.

Education

2019 - 2024 PhD (Electrical & Computer Engineering) at **Carnegie Mellon University**
Advisor: Aswin Sankaranarayanan
Thesis: Computational Imaging For Precise Prediction of Solar Irradiance.
2019 - 2022 M.S. (Electrical & Computer Engineering) at **Carnegie Mellon University**
2015 - 2019 B.S. (Computer Science) at **Morehouse College**

Experience

Carnegie Mellon University, *Graduate Research Assistant* August 2019 - Present

- Using computer vision and deep-learning-based predictive methods to forecast the availability of solar irradiance by imaging the spatial and temporal dynamics of atmospheric conditions.
- Developing novel computational imaging systems.

Samsung Research America, *Computer Vision Research Intern* June 2023 - August 2023

- Pioneered a proof of concept using Neural Radiance Fields (NeRF) to develop a real-time immersive telepresence application using a single monocular camera.

Idaho National Laboratory, *Data Analyst Intern* June 2019 - August 2019

- Enhanced predictive maintenance efficiency by developing regression-based machine learning models to automate crack length prediction given piezoelectric sensor data and constant fatigue loading profiles.
- Implemented this model in an online monitoring of Nuclear Power Plant assets such as generators; resulting in increased operational effectiveness.

NBCUniversal, *Software Engineer Intern* June 2018 - August 2018

- Revamped larger scale CNBC website from legacy PHP and MySQL to modern technologies including Node.js, JavaScript, GraphQL, MongoDB, and React.js, with focus on improving UI/UX elements.

Publications

Julian, Leron et al. (2018). "The Development of a Conversational Agent Mentor Interface Using Short Message Service (SMS)". In: *Proceedings of the 2018 ACM SIGMIS Conference on Computers and People Research*. Association for Computing Machinery.

Julian, Leron and Aswin C. Sankaranarayanan (2021). "Precise Forecasting of Sky Images Using Spatial Warping". In: *ICCV Workshop on Physics-based Vision meets Deep Learning*.

Projects

Enhanced Interaction Using Eye-Tracking For Virtual Reality Scene

- Improved interactions between users and objects within virtual and mixed-reality scenes using eye-tracking and the Meta Quest Pro headset.
- Developed using Unity and C# programming language.

Dynamic Graphs For Point Cloud Completion

– Improved point cloud completion (inpainting) using a Dynamic Graphs.
– Added k-NN dynamic graphs into the learning pipeline as a prior to model the overall structure of the input, resulting in a more accurate reconstructed point cloud.
– Implemented using PyTorch and PyTorch3D.

Novel View Synthesis of Transparent Objects using NeRF

– Improved traditional Neural Radiance Fields (NeRF) for novel view synthesis of transparent objects using shape from distortion and shape refinement.

Color-Filtered Aperture for Image Depth Segmentation

– Used an RGB coded aperture to capture a depth image (RGB-D) in a single image capture
– Developed using Unity and C# programming language.

Semi-Supervised Learning For Image Classification

– Investigated the effects that traditional regularization and consistency regularization methods had on performance of the self-training semi-supervised learning (SSL)
– Tested model on MNIST and STL-10 Datasets

Skills

Python (Proficient - 9 years of experience)
MATLAB (5 years of experience)
R
Pytorch (5 years of experience)
Blender
C++ (Proficient - 9 years of experience)
Java
HTML/CSS/JavaScript
TensorFlow
Unity

Teaching

CMU-18661 Machine Learning for Engineers
C-SCORE (Python and Computer Vision)
Morehouse-CSC160 Programming 2 (C++)

Graduate Coursework

Intro to XR systems
Sports Technology
Geometry-Based Vision
Computational Photography
Convex Optimization
Image & Video Processing
Intermediate Optics
Learning Based 3D Computer Vision
Estimation, Detection & Learning
Machine Learning
Computer Vision