Sukrit Arora

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EDUCATION	**University of California, Berkeley**, May 2021 *M.S., Electrical Engineering and Computer Science [Advisor: Michael Lustig]* *B.S., Electrical Engineering and Computer Science (May 2020)*

RELEVANT COURSES

Computer Vision*, Computational Photography, Statistical Signal Processing, Parallel Computing*, Statistical Learning Theory, High Dimensional Data Analysis, Machine Learning, Algorithms, Digital Image Processing, Digital Signal Processing, Probability Theory, Information Theory, Embedded Systems, Digital Design (FPGA)

*in progress

LANGUAGES

Python, C++, Verilog, Matlab, C, R, RISC-V, SQL, Java, Swift (iOS)

WORK EXPERIENCE

Computational Imaging Lab [Prof. Lustig], *Graduate Researcher*   May 2018 - Present

- Engineered a deep decoder generative network for image denoising and subsampled 3D magnetic resonance (MR) image reconstruction. [Conference Abstract][Code]
- Formulated a volumetric MR image stitching solution to minimize overlap artifacts

UC Berkeley EECS Department, *Undergraduate Student Instructor*   Jan 2018 - Dec 2019

- Devices and Systems & Computer Architecture: Led discussions and labs of 50 students on the fundamentals of circuit design, control and signals theory, and computer architecture
- Optimization [Prof. Bayen] & Signals [Prof. Ayazifar]: Created new, application-based labs and homework related to stock price tracking, communication systems, and image compression

Apple Inc., *Product Security Intern*   May 2017 - Aug 2017

- Created a Command Line Interface to perform complex queries on a distributed graph database (under NDA)
- Designed and implemented a server automation project (under NDA)

PROJECTS

Computational Photography Projects
| Colorizing the Prokudin-Gorskii Photo Collection | Image Straightening, Sharpening, Hybrids, and Blending
| Face Morphing | MNIST Fashion Classification and Facade Segmentation (CNNs)
| Image Warping and (Auto)-Mosaicing | Light Field Camera Processing, Seam Carving, HDR Imaging |

Facial Recognition Using Learned Low Dimensional Image Representations [Paper]
Used several different low dimensional image representations (Decimation, **Haar** Wavelet, **PCA**, **Convolutional Autoencoder**) to improve the performance of a **dictionary-based** classification algorithm for facial recognition

RISC-V CPU and Audio Synthesizer on FPGA [Report]
Made a 60 MHz, 3-stage pipelined, RISC-V CPU with user I/O and an NCO audio synthesizer.

Localization and Unpredictable Surveillance with Drones [Demo Video]
Using **IR Reflectors** and a system of **Motion Capture** cameras, localized and controlled a drone to randomly visit waypoints while avoiding an adversary turtlebot

Image Object Removal [Presentation]
Combined **Mask R-CNN** and **Generative Image Inpainting (GAN)** architectures in order to inpaint objects in a scene

Radio Modem and Image Compression Algorithm [Presentation]
Created our own variant of **JPEG image compression** and an **AFSK modem** to transmit images across a room. Placed third in the competition.

Self-Inverting Pendulum [Demo Video]
Created a self-inverting pendulum by combining a **LQR Controller** with a **Leunberger Observer** for state estimation and Bang-Bang control for swing-up.