# Anand Jain

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## EDUCATION

**University of Chicago** *B.S.*, Computer Science. **Expected Jun 2021**
**Santa Clara High School** **2017**

## COURSES

•Abstract Linear Algebra •Algorithms •Computer Systems •Discrete Math •Electronics •Interactive Devices •Mathematical Logic •Molecular Engineering •Quantum Computation

## SKILLS

**Languages:** Python, Go, Rust, Julia, Bash, C/C++, MySQL, LaTeX
**Packages:** PyTorch, Gym, TensorFlow, DiffEq.jl, Pandas, Flask
**Spoken:** Fluent English. Classroom Hindi, Spanish, and Mandarin

## EXPERIENCE

**Fermilab - LSST Machine Learning Intern** **Jun - Aug 2019**
•Researched applications of neural differential equations in astronomy for the Large Synoptic Survey Telescope (LSST)
•Used PLAsTiCC Astronomical Kaggle dataset to train a neural network to approximate the differential equation of different objects' light curves (brightness over time)
•Presented poster of my work on Neural-ODEs at 2019 LSST Conference in Arizona
•Worked with peers and mentors to create a high level API for Auto-ML and visualization of astronomy datasets, primarily in PyTorch and Matplotlib
**tools:** DifferentialEquations.jl, PyTorch, TensorFlow, Matplotlib, Python, Julia
**src :** deepskies/cosmoNODE and deepskies/dsutils

## PROJECTS

**gym-sips: reinforcement learning in sports betting on google cloud**
•Concurrent scraping ∼1000 games/day of odds, scores on Linux VM to Cloud SQL
•Created discrete and continuous action space gym environment for asset allocation
•Tested the PPO, SAC, and DDPG algorithms from OpenAI's Spinning Up in RL
•Agent learns to hedge across time and returns a positive net reward on test set
•Currently porting scraper to Rust
**tools:** pytorch, gym, spinningup, go
**src :** github.com/anandijain/sips (/sipgo => /sipoxide) and /gym-sips

**sippyart: variational-autoencoders for music generation**
•Built tool to recreate images and 1-2 second sections of audio using convolutional variational autoencoders running on GPU
•Model learns to recreate melody better than rhythm, examples in README
**tools:** pytorch, torchaudio, torchvision, opencv
**src :** github.com/anandijain/sippyart

**myquantum: the quantum learners repo**
•Wrote basic quantum math package in Julia to learn/teach basic linear algebra
•Implements common 1-qubit gates, arbitrary 2-qubit control gates, arbitrary rotation
•Functions for checking if normed, unitary, hermitian, and generating Bell states
•Goal: Build circuit interface and perform QFT on my own simulated QC
**tools:** Julia, LinearAlgebra.jl
**src :** github.com/anandijain/MyQuantum

## ACTIVITIES

**UCQuantum (.org) - Founder/President** **Aug 2019 - Now**
•Undergraduate Student Organization of ∼50 facebook group members, ∼10 active
•Toured Prof. David Schuster's lab and learned about cooling to superconducing temperatures and software interfaces to quantum computers
•Planning a hackathon in spring to make Prof. Schuster's computers compatible with QuTiP and QISKit