Xinyun (Leo) Liu

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EDUCATION

Rice University — Houston, TX
BS in **Computer Science**, BS in **Physics** GPA: 3.7/4.0 — Aug 2017 - May 2021

SKILLS

Programming Languages: Proficient – Python | Java Familiar – JavaScript| C++ | SQL
Other Technical Skills: React | Spark | Linux | Functional Programming | Parallel Programming

SELECTED PROJECTS

ChatApp: A full-fledged chatting app — Rice University | Jan 2020

Java | UML | MVC | OOP | Computer Networking

- Designed, developed, and documented a P2P chatting that supports any format of message and chatrooms
- Implemented the MVC framework and the Visitor Design Pattern on a Java program with 4000+ lines of code.
- Gained valuable experience in object-oriented design and program testing.

Fate Website — Rice University | Jan 2020

Java | JavaScript | React | Python | SQL | CSS | JSON

- Designed algorithms that automate the process of data processing
- Implemented SQL to store both the personal data and text data
- Deployed React to build a website that hosted by my own server that can be accessed everywhere

Pretty Pictures: Image Breeding and Mutation — Rice University | Nov 2018

Java | JavaScript | JSON | Functional Programming | Genetic Algorithms | Spark

- Designed data structures (alleles, geneTree, imageFunction, etc.) that streamlines representing, composing, and randomizing image functions through functional programming
- Implemented a genetic algorithm that iteratively improves existing gene trees through crossbreeding and mutation to produce artificial images
- Integrated the backend computation with a web page to enhance user experience

WORK EXPERIENCES

Solar Physics Research Group, Rice University — Houston, TX | Aug 2019 – Present

Undergraduate Researcher
Python | Machine Learning | GAN | Data Analysis & Visualization

- Used Streamlit (an app framework for Machine Learning) to build an app that can visualize spectrum data from solar corona and monitor the machine learning process that uses gigabytes of data
- Processed linear data as picture and used GAN to recover the heating event with only hundreds of well-chosen pictures
- To validate the physics model of the heating event and make the algorithm applicable to other data recovery job

Bonner Nuclear Laboratory, Rice University — Houston, TX | May 2018 – August 2018

Undergraduate Researcher Assistant
C++ | Distributed Computing | Machine Learning | ROOT | Linux

- Analyzed the data of tens of millions of collisions of J/psi mesons and strange charm mesons collected from LHC
- Used boost decision tree, rectangular cut and multi-layer perceptron to train the data to get a better selection of the signal through TMVA
- Manipulated data stored in trees and visualized them via ROOT
- Optimized the C++ software in the Linux environment and increased the signal significance by 200%