VIKRAM NAYAR

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EDUCATION AND SKILLS

Rice University Houston, TX
Bachelor of Arts in Computer Science Expected May 2021
Relevant coursework: Adv. Functional Programming, Adv. Object-Oriented Design, Distributed Systems, Compiler Construction, System Design, Algorithms II, Engineering Design, Linear Algebra
Programming languages: Java, Python, C, Haskell, MATLAB, HTML/CSS
Frameworks/Libraries/Tooling: Pytorch, Spark, VAVR, JUnit, RMI, QuickTheories, Gradle, GitHub, SVN
Technologies/Skills: Unix, MVC, NLP, Networking, I/O, Deep Learning, API Design, Pixel Animation

WORK EXPERIENCE

Rice University, Houston, TX
Teaching Assistant for Advanced Object-Oriented Programming (COMP 310) Aug. 2020 – Present

- Led laboratory sections, hosted help sessions for Java-written system design assignments, and graded student work

Computational Visualization Center, University of Texas Austin, TX
Programmer (Python) May 2020 – Present

- Contributed to a forthcoming research paper covering de novo drug discovery using deep reinforcement learning
- Trained and optimized stack recurrent neural network (with gated recurrent units) to generate valid ligands using protein-ligand pairs from the Protein Data Bank
- Designed a variational autoencoder to selectively filter molecular substructures in order to make otherwise large and unreadable data easily analyzed by scientists

RELEVANT PROJECTS

RBox Framework, Rice University Houston, TX
Programmer (Java) and Head of Fault Tolerance Lead Aug. 2020 – Present

- Designing and deploying a distributed system framework for multiplayer online games, providing game developers with a low-latency, scalable, fault tolerant way of synchronizing game state (works for a wide variety of game genres)
- Creating a multiplayer .io style game to demo the system's scalability, including servers that will disconnect at random times during the game to test fault tolerance
- Utilizing Raft consensus algorithm to elect leaders when there are faults and to synchronize the metadata in the federated portion – using MongoDB as a metadata store, and basic TCP/RPC libraries for communication

Chat App, Rice University Houston, TX
Programmer (Java) Mar. 2020 – Apr. 2020

- Built peer-to-peer network API capable of transferring messages of any kind (text, images, videos, applications, and more) to multiple users using Java RMI and a proxy based system – used by 60+ users
- Developed chat application with concurrent message sending, handling of network errors without failure, and ability to send users custom message processing algorithms

Malloc, Rice University Houston, TX
Programmer (C) Mar. 2020 – Apr. 2020

- Constructed dynamic memory allocator using segregated fits approach with ability to allocate, reallocate, and free arbitrary blocks of data
- Achieved throughput of 5.7 million operations per second with less than 15% heap fragmentation

PERSONAL PROJECTS

Duel Game Remote
Programmer (Java) and Animator Jun. 2020 – Present

- Currently working on an arcade shooter game – animating enemies and bosses, and designing a dispatcher system
- Game logic and UI written in Java, animations designed in Hexels 3

96.1 KTRU Radio, Rice University Houston, TX
DJ and Head Photographer Aug. 2019 – Present

- Curated a weekly radio show for local Rice area and online listeners; setlists included rap, jazz, indie, and classic rock
- Photographed live concert events on campus for the university newspaper