Zhiqin "Bill" Qian

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Education

Rice University **Houston, USA**
Bachelor of Arts, Computer Science *August 2019 – Present*

- GPA: 3.94/4
- Research Interests: Robotics, Human-Robot Interaction, Human-AI Interaction, Reinforcement Learning
- Relevant Coursework:
  - Computer Science Core: Algorithms, Data Structures, Object-Oriented Programming, Computer Systems, Parallel Programming, Compiler Construction
  - Artificial Intelligence: Reinforcement Learning, Statistical Models and Algorithms
  - Applied and Pure Math: Stochastic Modeling, Analysis, Linear Algebra, Statistics, Multivariable Calculus, Geometry
  - Cognitive Science: Intro to Psychology, Intro to Cognitive Science, Sciences of the Mind, Intro to the Study of Language

Honors, Awards

2019, 2021: President's Honor Roll (Based on semester GPA, approximately the top 30 percent of all undergraduates receive this academic recognition.)

Research Experience

Unhelkar Lab, Rice University **Houston, USA**
Research assistant *May 2021 - Present*

- Developed a photorealistic and easily reconfigurable computer-based testbed with Unity for conducting simulated human-robot interaction experiments.
- Automated and synchronized data collection from physiological sensors so that the dataset produced by the testbed can provide comprehensive information on cognitive features.
- Co-authored a manuscript that will be soon submitted to IEEE Robotics and Automation Letters (RA-L) highlighting the novelty of this dataset.
- Currently leading a study that uses physiological data to infer one's cognitive states (i.e. workload) to aid human behavior modeling.
- Created an interface that produces a replay of a completed task and periodically gathers self-reported mental states data during the replay.
- Developing a versatile pipeline that performs signal processing on physiological data and analyzes the interaction between physiological, environment, and reported data.

Treangen Lab, Rice University **Houston, USA**
Research assistant *May 2020 - Jan 2021*

- Curated data of DNA sequences with taxonomic and genetic annotations from 8 publicly available datasets for benchmarking analysis.
- Benchmarked SeqScreen's[1] performance on 1) identifying the species and genetic identity of DNA sequences and 2) detecting fingerprints of virulence of DNA sequences against 12 similar programs.
- Used the benchmarking results to showcase SeqScreen's outstanding performance and demonstrated the limitations of earlier software.
- Co-authored a published paper detailing the SeqScreen pipeline.

Work Experience

Rice University **Houston, USA**
Teaching Assistant for COMP 310, Advanced Object-Oriented Programming and Design *Fall 2022*

- Held weekly office hours on various design patterns, modeling complex physical systems via encapsulation and abstraction, and programming scalable networked systems.
- Helped 50+ students debug their software systems during weekly lab sessions.
- Graded weekly coding projects.

1 SeqScreen uses ensemble learning to detect the threat of input DNA sequences. The ensemble learning model takes in the species and genetic information identified by SeqScreen and outputs a label to categorize the potential harm of the sequence.

Rice University **Houston, USA**
Teaching Assistant for COMP 382, Reasoning About Algorithms *Fall 2021*
- Held weekly office hours on data structures, graph algorithms, dynamic programming, randomized algorithms, and NP-Completeness.
- Guided 50+ students through practice problems during lab sessions.
- Graded bi-weekly homework assignments, the midterm and final exam.

Rice University **Houston, USA**
Teaching Assistant for COMP 182, Algorithmic Thinking *Spring 2021*
- Held weekly office hours on algorithms and their complexity, proof writing, recursion, relations, graph theory, and discrete probability.
- Developed and maintained an auto-grader tool to automate the grading of students' coding submissions.
- Graded the midterm and final exam.

Oshman Engineering Design Kitchen, Rice University **Houston, USA**
Design Engineer *Fall 2019*
- Designed and built 3 robot-themed puzzles for the Children's Museum of Houston.
- Integrated electrical components with physical components of the puzzles so that they can reset and give feedback to children.

Publications

Published

June 2022: Balaji, A.*[2], Kille, B.*, Kappell, A. and Godbold, G., Diep, M., Elworth, R., **Qian, Z.**, Albin, D., Nasko, D., Shah, N., Pop, M., Segarra, S., Ternus, K., Treangen, T. SeqScreen: accurate and sensitive functional screening of pathogenic sequences via ensemble learning. Genome Biol 23, 133 (2022).

In Progress

November 2022: Savko, L.*, **Qian, Z.***, Unhelkar, V. Multimodal Human Behavior Dataset with Annotated Latent States in a Rescue Environment.

Talks

April 2022: "A Testbed for Studying Human-Robot Collaboration During Disaster Response," Rice Undergraduate Research Symposium. Rice University, Houston, TX.

Participations

December 2022: 4th IFAC Workshop on Cyber-Physical & Human-Systems, Houston, TX.

Volunteering

Office of Academic Advising, Rice University **Houston, USA**
Peer Academic Advisor *Feb 2020 - Present*
- Oversaw and coordinated academic advising programs during orientation week for 100+ new students.
- Holds monthly office hours to help students navigate through academic procedures and resources.

Skills

Programming Languages: Proficient - Python, Java, C#; Familiar - C, C++

Languages: English (bilingual proficiency), Mandarin (native proficiency)

Interpersonal Skills: Communication, Collaboration, Leadership

2 The names of first authors are followed by an asterisk.