Bill Qian

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Education

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

- GPA: 3.94/4
- Research Interests: Human-Robot Interaction, Robotics, Reinforcement Learning, Human-AI Interaction
- Relevant Coursework:
  - Computer Science Core: Algorithms, Data Structures, Object-Oriented Programming, Computer Systems, Parallel Programming, Compiler Construction
  - Artificial Intelligence: Reinforcement Learning, Interactive Machine Learning, Statistical Models and Algorithms
  - Applied and Pure Math: Stochastic Modeling, Analysis, Linear Algebra, Statistics, Multivariable Calculus, Geometry, Calculus on Manifolds
  - 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*

Project 1: Simulation Testbed for Human-Robot Teamwork

- Developed a photorealistic and easily reconfigurable computer-based testbed in 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 one's cognitive states (i.e. workload).
- Co-authored a manuscript that will soon be submitted to IEEE Robotics and Automation Letters (RA-L) highlighting the novelty of this dataset.

Project 2: After Action Review to Improve Human-Robot Teamwork

- Currently leading a study that uses physiological data to infer one's cognitive states to aid human behavior modeling.
- Created an interface that produces a replay of a completed task and periodically gathers self-reported cognitive states data during the replay.
- Designed and performed in-person user experiments.
- Developed a versatile pipeline that performs signal processing on physiological data and analyzes the interaction between physiological, self-reported, and Unity environment data.
- Authoring a manuscript that describes our success in inferring one's cognitive states from physiological and demographic 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.

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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.

Work Experience

Rice University   **Houston, USA**
Teaching Assistant for COMP 182, Algorithmic Thinking   *Jan 2021 - May 2021, Jan 2023 - Present*
- 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 homeworks, midterms and final exams.

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

Rice University   **Houston, USA**
Teaching Assistant for COMP 382, Reasoning About Algorithms   *Aug 2021 - Dec 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.

Oshman Engineering Design Kitchen, Rice University   **Houston, USA**
Design Engineer   *Aug 2019 - Dec 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.
- Hold monthly office hours to help students navigate through academic procedures and resources.

Skills

PROGRAMMING LANGUAGES: Proficient - Python, Java, C#; Familiar - C, C++

LANGUAGES: English, Mandarin

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