Raquel Ana Bush

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Driven computer science MS student. NSF CyberCorps Scholarship for Service recipient.

Education

- **Master of Science in Computer Science** (*Expected May 2026*)
  - GPA: 4.0
- **Bachelor of Science in Computer Science** (*May 2025*)
  - Artificial Intelligence concentration, Mathematics minor
  - GPA: 4.0
  - Big Data Club (Vice President 2024-2025), Navigating Leadership, Math Circle
- **Associate of Science in Mathematics and Computer Science** (*2023*)
  - Certificate - Java Programming
  - GPA: 4.0

Experience

- **Graduate Researcher** (*2025*)
  - Funding: National Science Foundation (NSF)
  - Trained and evaluated multiple machine-learning models on the EMBER 2018 dataset to benchmark detection performance, analyze feature importance, and assess robustness to adversarial manipulation, with the goal of advancing the effectiveness and resilience of automated malware detection in evolving threat environments. Preparing a research paper for publication.
- **Team Lead, Fog of War Chess Assistant Capstone Project** (*2024*)
  - Client: NUWC Division Newport
  - Leading a team to develop an AI-powered chess assistant that adapts modern chess engine decision-making for Fog of War variant constraints, leveraging AI to simulate incomplete information scenarios. Designing a collaborative assistant tool that strategically supports a user in exploiting their opponent's biases, integrating NLP to interpret user input and influence move suggestions for the chess engine.
  - Overseeing project milestones, coordinating team responsibilities, and ensuring alignment with client requirements and expectations.
- **Research Assistant, University of Massachusetts Dartmouth College of Engineering** (*2024*)
  - Aided in developing wearable device using Arduino Nano 33 BLE Sense Rev2, with a focus on sensor programming, power management integration, and remote data storage.
  - Handled hardware design, software development, and system integration.
- **Research Assistant, Duke Empathy Development Lab** (*2019-2020*)
  - Recruited research participants.
  - Collected data for ongoing studies using Matlab.

Personal Projects

- **Masqueraded File Checker:** Created a program that checks if the file extension matches the hex file signature for each file within a given folder.
- **Harmoniac:** Developed a music recommendation system utilizing content-based filtering and k-means clustering to overcome the cold-start problem.
- **PopOpinions**: Created a Twitter sentiment search application utilizing NLP techniques.
- **Analysis of a Spotify Collaboration Network for Small-World Properties:** Applied Big Data and graph theory techniques to study a large feature collaboration network of artists in order to uncover structural patterns of great significance to recommendation systems and industry research.
- **Synthetic Number Generator:** Generated synthetic handwritten numbers using GAN with discriminator training on real vs. fake detection.
- **Smart Hangman:** Created a hangman game that dynamically changes the word, making it difficult to beat.
- **Personal website:** Developed a responsive, interactive portfolio website using HTML, React, and Tailwind CSS to showcase professional experience, technical skills, and projects.

Skills

- Java
- Python
- C++
- C
- AI/ML
- Neural networks
- NLP
- APIs
- OOP
- Linux
- Critical thinking
- Problem solving
- Collaboration
- Teamwork
- Communication
- Bilingual English/Portuguese

Community Involvement

- **Intern, California Desert Chorale** (*2018-2019*)
  - Contributed to the ensemble as a vocalist for the concert season as invited and sponsored by the Chorale.
- **Intern, Dr. Raul Ruiz for Congress** (*2018*)
  - Spread the word about Congressman Dr. Raul Ruiz's political platform and connected members in the community with information and resources for voting.
- **Worship Team member, Our Savior's Palm Springs** (*2015-2019*)
  - Contributed as a guitarist and vocalist for Sunday worship services and other events.

Relevant Coursework

- Cyber Defense & Operations
- Parallel & Distributed Software
- Digital Forensics
- Network Security
- Computer Architecture
- Data Structures & Algorithms
- Artificial Intelligence
- Data Mining
- Machine Learning
- Statistics
- Linear Algebra
- Probability
- Discrete Mathematics II
- Calculus III
- Differential Equations
- Small World Networks
- Advanced Computer Systems
- Design of Operating Systems