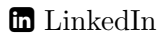


PAKHI SINHA



LinkedIn



GitHub

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EDUCATION

University of California Santa Cruz, USA

September 2021 - December 2024

B.S. Computer Science

CGPA: 3.75/4.00

Sarah Matthews Scholarship

SKILLS

Languages C/C++, Python, JavaScript, MATLAB, HTML, CSS

ML Libraries Pytorch, PANDAS, Scikit Learn, Numpy

Others SQL, Blender, Git, Tableau

WORK & RESEARCH EXPERIENCE

Research Assistant

August 2023 - Present

Research Internship in Cognitive Psychology - Computational and Experimental Cognition Lab

University of California Santa Cruz

- Enhanced video processing pipeline to account for numerous experimental conditions by demonstrating proficiency in libraries like **ffmpeg** and **librosa** to clean and process participant videos for speech production through reading-aloud tasks
- Utilized OpenFace to extract 3D visual features, elucidating data that help us conclude how individuals make use of **visual cues (facial expressions and head movements) to emphasize words**
- Adapted existing preprocessing pipeline for singular word analysis to suit sentence-level verbal emphasis, allowing analysis on where emphasis is placed depending on if the sentence is a question or a statement

Research Assistant

June 2023 - September 2023

Tech4Good Lab, University of California Santa Cruz

■ *Crocetti 2007*

- Demonstrated adaptability in diverse statistical tools by transitioning frameworks to utilize Pingouin and Statsmodels instead of Python libraries like Pandas, Numpy, & Semopy
- Contributed to analysis of **Crocetti (2007)**, which utilizes **Cronbach's alpha, Confirmatory Factor Analysis** (producing several statistics, notably, GFI, CFI, & RMSEA)
- Applied **Utrecht-Management of Identity Commitments Scale (U-MICS)** to deepen understanding of identity formation in college students

Research Assistant

November 2022 - June 2023

Social & Emotional Technology Lab, University of California Santa Cruz

- Successfully developed **WebXR applications** using **Three.js** library, enabling immersive experiences that load seamlessly in web browsers
- Enabled enhanced user interactions by collaborating with a multidisciplinary team on integrating **pass-through features** (detecting real-world surroundings) in **Virtual Reality** using Meta Quest Developer Hub

Technical Intern

November 2019 - December 2019

Make-A-Wish Foundation, India

- Performed data backup procedures to secure and analyze children's wishes of 4 categories (I wish to be, I wish to meet, I wish to go, I wish to have)
- Contributed to strategic planning by summarizing performance statistics using Salesforce
- Demonstrated effective communication skills in presenting aforementioned reports to supervisors

PROJECTS

Multi Threaded HTTP Server

October 2023 - December 2023

University of California Santa Cruz

 *Repository*

- Engineered a multi-threaded HTTP server utilizing a thread-pool design to manage concurrency through **N-Way policy synchronization**, ensuring coherent and atomic **linearization** of client requests
- Employed a hashmap data structure to store previous file accesses, and reader/writer synchronization mechanisms associated with them to allow multiple threads to read a resource concurrently, but grant only one thread exclusive write access
- Utilized **GDB** to monitor thread behavior, aiding in debugging, ensuring safe concurrent access to shared resources, resulting in avoiding deadlocks and race conditions

Lempel-Ziv Compression and Decompression algorithm

February 2023 - March 2023

University of California Santa Cruz


 *Repository*

- Leveraged **trie data structure** and lookup table mechanism to achieve optimal compression ratios while maintaining fast encoding and decoding speeds, while facilitating efficient storage and retrieval of compressed data
- Ensured reliability in data compression and decompression processes by utilizing **bit manipulation techniques** to extract and reconstruct variable length codes and associated symbols
- Incorporated byte order swapping routines to accommodate both little-endian and big-endian systems, achieving **cross-platform compatibility**

Software for PET data visualization & updating DAC levels for RIL

October 2022 - January 2023

Radiological Instrumentation Lab, University of California Santa Cruz

 *Repository*

- Co-authored a **cross-platform GUI**, to conveniently visualize data from PET system and update configuration files, contributing to **research initiatives in biomedical imaging**
- Conducted comprehensive research on various packages and frameworks to implement desired features (creating pop-up windows, etc.), demonstrating proactive approach to development
- Proficiently authored user-friendly documentation for software installation and setup, offering a clear step-by-step tutorial for end-users across different operating systems

COURSEWORK

Undergraduate

Data Structures & Algorithms, Computer Architecture, Computer Systems Design, Machine Learning, Computer Programming

OTHER EXPERIENCES

Tutor

January 2024 - Present

Course: Principles of Computer Systems Design

- Demonstrated expertise in C programming language, aiding 50+ students through developing an HTTP server, including handling GET and PUT requests, and response generation
- Applied advanced debugging techniques to identify and resolve complex coding errors in students' projects and assignments, including memory leaks, segmentation faults, resulting in significant improvements in code functionality and optimality

Tutor

September 2023 - December 2023

Course: Data Structures & Algorithms

- Utilized visual aids, diagrams, and interactive online resources to supplement classroom instruction and reinforce key concepts such as arrays, linked lists, trees, graphs, and searching algorithms

Co-President

September 2021 - November 2022

Rotaract Club of Santa Cruz County

- Organized fundraisers for organizations like Habitat for Humanity, and The Homeless Garden Project
- Reestablished team after COVID-19, increased participants to events by 20% by focusing on outreach teams
- Attended SOAR leadership workshops, and orchestrated regular meetings with a clear goal, and decided steps to follow through to achieve said goal