Pamela Nguyen

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EDUCATION

The University of Texas at Austin, Austin, TX *December 2022*
Bachelor of Science in Mathematics, Computational Physics

- Certificate in Elements of Computing, Scientific Computation & Data Sciences
- Recipient of the Melvin J. Rieger Scholarship Fund in Physics (2022)
- Relevant Coursework:
    - Mathematics: Numerical Methods I/II, Probability, Mathematical Statistics, Differential Equations with Linear Algebra, Scientific Programming, Advanced Calculus for Applications II, Matrices and Matrix Calculations, Vector Calculus, Game Theory
    - Computer Science: High Performance Computing (HPC), Introduction to Statistical Computing, Elements of Data Analytics, Elements of Databases, Data Structures and Algorithms, Elements of Software Design, Introduction to Research
    - Physics: Circuit Theory and Electronics, Thermodynamics, Wave and Optics, Modern Physics and Lab, Quantum Mechanics, Classical Mechanics, Classical Electrodynamics

SKILLS

Technical/Computer Skills: Proficient in C++, Java, Python: NumPy, pandas, scikit-learn, matplotlib, PyTorch, SymPy, SciPy; Jupyter Notebooks, Bash/Unix/Linux, MATLAB, LaTex
Familiar with Google Cloud Platform, SQL, Postgres, BigQuery, NoSQL, Fortran 90
Languages: Spanish (A1), French (A2), English (Native), Vietnamese (Social)
Interests: Data Analysis, Machine Learning, Quantitative Research, Photography, Law: Intellectual Property & Business

PERSONAL AND ACADEMIC PROJECTS

Senior Research Thesis, Austin TX Jan 2022 - Dec 2022
Personal Academic Project

- Filtered, sorted, plotted and correlated the effects of rDNA copy number extremities on gene expression and genomic variation of over a million C. elegans records provided by the Million Mutation project. Used: Python: pandas, matplotlib, NumPy, seaborn
- Independent research thesis under the guidance of a professor to scientifically compute, research, and analyze millions of C. elegans strain records.

GNU and Intel C++ Compiler Optimizations, Austin TX Sept 2022
Academic Project

- Experimented, researched, and sped up a C++ file using compiler transformations on both Intel (icc) and GNU (g++) compilers on the Texas Advanced Computing Center (TACC) Frontera nodes. Used: C++, bash, Frontera (TACC), Matlab

Infectious Disease Simulation, Austin TX Oct 2019 - Dec 2019
Academic Project

- Model and tracked disease propagation within a population from an infectious person statistically using an explicit SIR model in C++.
- Analyzed and plotted the effects that contagion probabilities, population sizes, contact spreading probabilities, and inoculation percentages had on the contagiousness of the disease until the population obtained herd immunity in Matlab. Used: C++, bash, Frontera (TACC), Matlab

RDBMS Hardware and Software Optimizations, Austin TX May 2022
Academic Project

- Deployed, tested, and improved the runtime of a relational database management system (RDBMS) environment on a Compute Engine instance in GCP using Postgres 13. Used: Postgres, Python, GCP, Git, bash

- Improved the latency of writing 8 million records by adjusting the batch size, upgrading the bandwidth, and increasing the CPU.

Ensemble Classifiers Analysis on Credit Card Transactions, Austin TX Nov 2021
Academic Project
- Partitioned the data for cross validation using a stratified k-fold and fitted scikit-learn machine learning algorithms: AdaBoost and Random Forests, on over 140,000+ credit card transactions to predict fraudulent charges.
- Concluded the random forest algorithm yielded a higher accuracy of determining fraudulent charges when calculating the TPR, PPV, FPR and plotting the ROC curves for each fold. Used: Python: scikit-learn, matplotlib

Hierarchical Clustering on Raw Ballots Casts from Presidential Candidates, Austin TX Nov 2021
Academic Project
- Implemented Scipy hierarchical clustering functions to plot dendrograms using various proximity measures: ward, min, and max, on data provided by The American Presidency Project to calculate their Cophenetic Correlation Coefficient (CPCC). Used: Python: scikit-learn, Sci-Py
- By observing and clustering the voting tendencies of states, I was able to identify swing states which will be useful for election predictions.

Comparison of Numerical Solvers for Nonlinear Equations, Austin TX Feb 2022
Academic Project
- Developed C++ scripts to use the numerical methods: fixed point iteration, Newton-Raphson method, secant method, and Newton-bisection method to find the maximum deflection point of a loaded bookshelf given the Young's modulus
- By tabulating and plotting the relative error at each iteration in Matlab, I was able to graphically compare the accuracy and speed of each algorithm to prove that the Newton-Raphson method converged the fastest. Used: Matlab, C++, Excel

Raspberry PI Retro Gaming Console, Austin TX Sept 2021 - Dec 2021
Personal Project
- Designed a schematic for a customizable portable handheld gaming console capable of installing wireless software updates and downloading retro GameBoy and Nintendo 64 games.
- The console consisted of an energy efficient over-discharge protection circuit, Game Boy housing shell, and Raspberry Pi Zero W installed with Recalbox. Used: Raspberry Pi, bash, soldering iron, drills, rotary tools

EXPERIENCE

UT Austin: Molecular Biosciences, Austin TX January 2019 - Present
Undergraduate Researcher under Professor Elif Sarinay Cenik
- Generated and executed computational pipelines using Python (pandas, NumPy, seaborn, matplotlib), Bash, and R for parsing, visualization, statistical analysis, and other processing of data generated by NGS workflows.
- Produced and tested bash pipelines that converted raw sequencing data (FASTQ, FASTA) to binaries (BAM) in order to save storage and create readable variant data (VCF) for analysis. This pipeline was used to convert all sequencing data in the lab.
- Improved the efficiency (-20 mins per 1TB of data) and the accuracy (+8%) of the sequencing pipelines by generating test data, adjusting pipeline parameters, and increasing CPU/RAM.
- Consistently communicates with peers, professors, and researchers on implementing modern research tactics and improving accuracy of results and data.
- Senior Research Thesis: Filtered, sorted, plotted and correlated the effects of rDNA copy number extremities on gene expression and genomic variation of millions of C. elegans records. Used: Python: pandas, NumPy, seaborn

Juni Learning May 2022 - Present
Computer Science and Mathematics Instructor

- Execute advanced computer science lesson plans including basic data structures, object-oriented programming, and machine learning algorithms over Zoom for students ages 8-18 while adapting to student needs and interests. Skills used: Python: Keras, NumPy, SciPy, Scikit-Learn, Java, C++, Scratch
- Communicate with family members on a regular basis, providing updates and maintaining records on student progress and results from learning assessments.

Apple, Austin TX
Specialist June 2022 - Present

- Providing daily customer service to hundreds of customers by uncovering customer needs, then following through with enlightening solutions and building long lasting relationships
- Bringing Apple products, services and ecosystem to life through demos, personalization, and answers to customer questions

Technical Advisor March 2020 - Jan 2021

- Knowledgeable in operating and troubleshooting iOS and MacOS devices while remaining up-to-date with the latest technologies and solutions applicable to company products.
- Consistently exudes professionalism and maintaining privacy when handling customer information while sustaining standard average handle time and customer satisfaction.

UT Austin: White Dwarf Stars Research, Austin TX June 2019 - Aug 2019
Undergraduate Researcher under Professor Mike Montgomery

- Implemented and created Jupyter Notebooks using Python and libraries such as NumPy, Scipy, Sympy and PyTorch to analyze and simulate white dwarf stars data. Such tasks included the creation and calibration of dark and flat frames to calculate aperture photometry.
- Obtained flat and dark data from the McDonald Observatory with given possible white dwarf star coordinates. Acquired over 4+ days' worth of data. Skills used: Python (NumPy, SciPy, Sympy, PyTorch)

Texas Archeological Research Lab (TARL), Austin TX Jan 2019 - June 2019
Student Associate

- Systemized, documented, distributed and maintained all library materials within the TARL library and internal archeological databases. Skills used: Excel
- Archived 100+ archeological documents and publications into the databases and physical library.

Portia Talley Law, Killeen TX June 2018 - Jan 2019
Intern

- Prepared and cataloged attorney documents for family law, mediation, and small business cases. Aided and archived 10 cases regarding such areas of law during the duration of the internship.
- Researched specific questions of law and policy and while noting detailed information during consultations and hearings.
- Additional tasks include scheduling client consultations, completing client intake forms, and answering calls regarding attorney prices and bundles. Skills used: Lawpay and CaseFox.