Andy Kapoor

16 Brentwood, Irvine, CA, 92620
andyklego@gmail.com | 949-413-0675
LinkedIn

I am a bioinformatics and software development enthusiast with proficiency in data analysis, sequence analysis, CAD design, 3D printing, Linux, Python, and web development tools. My collegiate background in computer science and biochemistry has taught me data analysis skills, particularly in processing and visualizing complex datasets with R. I have demonstrated leadership in organizing events and managing project development, and have been recognized for academic excellence through prestigious awards. My interdisciplinary research contributions span computer architecture, computational biology, molecular biology, and environmental studies. Currently, I am entering a Materials Science and AI in Materials M.S. program at Duke University, where I continue to advance my passion and expertise in software engineering, data analysis, computational biology, and web development through both research and practical experience.

Professional Experience

Bioinformatics Student Employee

Southern California Coastal Water Research Project, Costa Mesa, CA | September 2023 - Present

- Multiple sequence analyses using Linux-based QIIME 2 software for a publication on Environmental DNA studies; statistical analyses of results
- Data Visualization
- Created Python-based scripts using NCBI Entrez Programming Utilities for querying and downloading custom sequence & taxonomic data in Linux servers.
- Used rCRUX to create custom sequence reference libraries.
- Developed an HTML-based website to visualize study sites and enhance data accessibility.

Microbiology Laboratory Student Employee

Southern California Coastal Water Research Project, Costa Mesa, CA | June 2023 - Present

- Worked with scientists and graduate students on environmental studies using sewage exfiltration methods.
- Data Entry
- Conducted large-volume DNA extractions quantified with the Qubit fluorometer.
- Utilized vacuum filtration systems with MC and PC filters for organism sample collection before DNA extraction.
- Maintained laboratory space and adhered to sterile techniques.

Computer Science Laboratory Researcher

Concordia University Irvine, CA | May 2023 - December 2023

- Conducted research and development on the university's autonomous drone project.
- Used CAD design and mSLA 3D printing to create support/mounting parts for components such as the camera, flight controller, and antenna.
- Tested optimal operating conditions and compared software for manual control of the drone.

Molecular Biology Laboratory Manager

Concordia University Irvine, CA | January 2023 - September 2023

- Maintained molecular biology lab space and assisted with lab setups for classes.
- Worked through site-directed mutagenesis studies (PCR, DPN1 Digest, Restriction Digest, CIAP, Ligation, Transformation, Minipreps).
- Created bacterial stocks and stock plates.
- Performed growth assays, primer design, sequence analysis, and gel electrophoresis (DNA and Protein), Sanger sequencing, Qubit fluorometer quantification, and custom protocol design.
- Maintained media stocks and performed machine maintenance.
- Assisted students with thesis projects.

Teaching Assistants

Concordia University Irvine, CA | January 2023 - December 2023

- Assisted with lab setups and grading for Bio 112 (General Biology II) in Spring 2023.
- Provided support for lab setups and grading in Biology 308 (Molecular Genetics) and Biology 371 (Neuroscience) in Fall 2024.
- Assisted Bio 111 (General Biology I) TAs with their duties.

Biology III Tutor

Concordia University Irvine, CA | August 2022 - January 2023

- Tutored Concordia University Irvine students enrolled in Biology III (General Biology I).
- Created lesson plans and reviewed course content to effectively teach and support students for daily coursework, quizzes, labs, and exams.

Education

Bachelor's of Science

Concordia University Irvine, CA | August 2021 - July 2024

Biochemistry major and Computer Science minor graduate from Concordia University Irvine.

Master's of Science in Materials Science and AI in Materials Certification
Duke University, Durham, NC | August 2024 - May 2026
Incoming Master's Student at Duke University

Key Skills

- Data Processing, Analysis, Visualization
- Statistical Testing
- EDNA Sequence Analysis
- Linux, CLI, Bash, Shell, Python, C#, R
- Web Development
- CAD Design
- Protocol Design
- Laboratory Techniques
- 3D Printing
- Research & Development
- Software Testing
- Interdisciplinary
- Eager Learner
- Critical Thinking
- Communication
- Leadership & Management
- Tenacity & Grit
- Determination

Related Projects

- Gaze Data Time Series Autocorrelation Analysis in R
- Data Analysis and Interpretation in R
- Statistical Tests in R (Chi Squared Goodness of Fit, Chi Squared Contingency, Shapiro Wilk, Z test, Binomial Test, one sample T-test, paired T-test, Fisher's Exact, Welch's approximate, ANOVA, Tukey Kramer, Logistic Regression, Correlation, Regression, F-test, Levine's, Spearman Rank, Multiple Regression, Mann Whitney U, Kruskal Wallis, Permutation Test)
- Data Validation Checks for Environmental DNA Experiments
- State COVID Population Data Modeling and Visualization
- Assessment of Rosetta Ab Initio, AlphaFold, AutoDock in computational simulations
- QIIME 2 16S Sequence Analysis and Data Visualizations in Linux
- Local BLASTN Nucleotide Database Queries

- Creating reference libraries with rCRUX
- Creating Custom Gene Sequence Databases in Linux
- River Sensor Current Flow Data Visualization
- Small Binary File Client and Server (Networking)
- Markov Chain Text Generation
- Sorting Algorithms (Data Structures)
- Monte Carlo Circle Area Prediction
- Playfair Cipher Encryption and Decryption Algorithms
- Image Manipulation with Python CImage Library
- Numerical Analysis Convergence Algorithms (In Python: Bisection Method, Fixed Point Iteration, Newton's Method, Muller's Method, Neville's Method, Cubic Spline Interpolation, Richardson's Method)
- Undergraduate Research: Overexpression model of CCS1 and SOD1 in yeast (Studying Physiology of Amyotrophic Lateral Sclerosis), Investigation of Computational Modeling Accuracy in Malate Dehydrogenase Structure Predictions and Interactions (Linux Implemented Rosetta Ab Initio, AlphaFold, AutoDock Vina, PyMol), Autonomous drone studies.

Accomplishments

Congressional Award Gold Medal

The Congressional Award | *June 2023*

Awarded for exceptional leadership, completing 400 hours of volunteer public service, 200 hours of personal development, 200 hours of physical fitness, and a 5-day, 4-night expedition, all within a minimum of 24 months.

2x Dean's List

Concordia University Irvine | *July 2024*

2x Dean's List recipient, recognized for academic excellence by maintaining a high GPA and ranking in the top percentile of students at Concordia University Irvine.

2x Presidential Academic Showcase

Concordia University Irvine | *July 2024*

Achieved 3rd place in Tier 2 for Molecular Biology Research and 4th place in Tier 1 for Molecular Dynamics Simulations/Computational Biology Research.

Affiliations

Congressional Award Diversity Ambassador

I serve as a Diversity Ambassador for the Congressional Award Foundation, promoting inclusivity and diversity within the program. I interacted with diverse communities to raise awareness about the award's opportunities, facilitated workshops and events at the Gold Medal Summit to encourage participation from underrepresented groups, and collaborated with foundation members to develop strategies for fostering a more inclusive environment.

Molecular Biology Student Researcher

As a student researcher in the molecular biology laboratory at Concordia University, I worked on Amyotrophic Lateral Sclerosis research regarding Superoxide Dismutase (SOD1) and its Copper Chaperone (CCS1), to create overexpression models and understand the physiology of the proteins.

Phi Delta Epsilon (Former Member and President)

As a member and former president of Phi Delta Epsilon, I created events, secured guest speakers, and facilitated communication between members, the board, and local and national chapters, upholding the values of philanthropy, deity, and equity while leading initiatives to support medical students and community health efforts.

Omicron Delta Kappa (Former Member)

As a member of Omicron Delta Kappa, I embodied the society's core values of leadership, scholarship, and service, contributing to campus initiatives and fostering academic excellence and community involvement.

Beta Beta Beta Biological Honors Society (Former Member)

As a member of Beta Beta Beta Biological Honors Society, I promoted the society's mission to advance the understanding and appreciation of biological study and research through academic excellence, scholarly pursuits, and community service.

CUI American Chemical Society Branch (Former Vice President)

As Vice President of the CUI American Chemical Society branch, I supported the advancement of chemistry as a science and profession, organizing events and activities that fostered scientific curiosity, professional development, and community outreach.

CUI Association of Computing Machinery Branch (Former Student Representative)

As a Student Representative for the CUI Association of Computing Machinery, I created guest speaker events, donated a 3D printer, and set up the machine for student use,

promoting the ACM's values of advancing computing as a science and profession through educational and professional development opportunities.

Symphony Orchestra Cellist

I was a cellist in the symphony orchestra, participating in rehearsals and concerts, as well as continuous practice to master complex repertoires. I worked closely with fellow musicians and the conductor to deliver quality performances.

Volunteering

Orthopaedic Physician Shadow

(16300 Sand Canyon Ave, Irvine, CA, 92618) | February 2022 - December 2023

Gained firsthand experience in orthopedic medicine by shadowing a physician and observing patient consultations, procedures, and post-operative care. I acquired knowledge of diagnostic techniques, treatment plans, and the day-to-day responsibilities of an orthopedic specialist.

Neurosurgery Shadow

(101 The City Dr S, Orange, CA 92868) | January 2022 - December 2023

I shadowed a neurosurgeon specializing in epilepsy, observing patient consultations, surgical procedures, and the implantation of Vagus Nerve Stimulators (VNS). Studied diagnostic techniques, treatment plans, and the difficulties of managing epilepsy through neurosurgical interventions.

Pediatric Cardiologist Shadow

(3440 E La Palma Ave, Anaheim, CA 92806) | November 2022 - November 2022

I shadowed a pediatric cardiologist, observing patient evaluations, diagnostic procedures, and treatment planning for children with heart conditions. Gained exposure to echocardiograms, electrocardiograms, and other cardiac imaging techniques, as well as patient interactions and the management of congenital and acquired heart diseases in a pediatric setting.

Emergency Room Volunteer

(6640 Alton Pkwy, Irvine, CA 92618) | June 2021 - July 2023

I restocked IV carts, assisted nurses, shadowed nurses when applicable, made beds, and transported patients in wheelchairs, supporting the operation of the emergency room and patient care.

ICU Shadow

(6640 Alton Pkwy, Irvine, CA 92618) | February 2023 - June 2023

I shadowed an ICU intensivist, observing critical patient care, advanced life support techniques, and the management of complex medical conditions. Learned about ventilator management, medication administration, and the coordination of multidisciplinary care teams in a high-acuity setting.

Healthcare Ministry

(4515 Portola Pkwy, Irvine, CA 92620) | December 2018 - July 2024
Healthcare Ministry for Saddleback Church Irvine North.