Digvijay Jani

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Education

University of California, San Diego
La Jolla, CA

Bachelor of Science in Chemical Engineering
September 2018 - June 2022

- Minors in Biology, Chemistry, and Data Science

Work Experience

UC San Diego: School of Medicine - Center for ALS Research & Therapy
La Jolla, CA

Research Assistant
September 2020 - Present

- Worked with Dr. John Ravits to identify mechanisms & therapeutic targets of neuronal degeneration in ALS, due to repeat expansions in C9orf72.
- Identify proteins binding to G_4C_2 & G_2C_4 repeat expansions in C9orf72 RNA transcripts of cells afflicted by ALS & determine full sequence and structure of repeat expansions.
- Implement various techniques to investigate appropriate targets for antisense oligonucleotide therapies.
- Performed lab chores and contributed to the design, execution, and interpretation of experiments.

UC San Diego: School of Medicine - Center for Neural Repair
La Jolla, CA

Research Assistant
February 2020 - Present

- Worked with Dr. Armin Blesch on identifying mechanisms influencing neuronal plasticity and regeneration in the mammalian nervous system.
- Implemented various techniques to investigate the potential role of neural stem cells and biomaterials in spinal cord regeneration.
- Assisted with projects addressing the structural changes associated with pain development after spinal cord injury.
- Validated findings in rodent models through gene therapy.

UC San Diego: National Center for Microscopy and Imaging Research
La Jolla, CA

Computational Neuroscience Intern
August 2019 - Present

- Computational neuroscience study in software development for large-scale biomedical image analysis.
- Implemented deep neural networks and image processing pipelines with regard to learning, memory, and inter-neuron communication.
- Developed a Python program to generate colored meshes from label volumes and isolate unique regions.

UC San Diego: School of Medicine - Altman Clinical & Translational Research Institute
La Jolla, CA

Undergraduate Research Assistant
September 2019 - April 2020

- Worked with Dr. Derek Welsbie on developing a neuroprotective strategy for glaucoma.
- Implemented various techniques to identify drug targets in primary mouse and stem cell-derived human retinal ganglion cells.
- Assisted with projects addressing the signaling pathway in retinal ganglion cell death.
- Validated findings in rodent models using gene therapy.
- Performed lab chores and helped with the design, performance, and interpretation of experiments.

University of California, San Diego - School of Medicine - Department of Pathology
La Jolla, CA

Digital Pathology Intern
September 2018 - August 2019

- Digital pathology research group verifying the viability of digital scans of tissue slides to replace physical samples.
- Helped pull slides from archives, scanned slides with a digital slide scanner, and shadowed Dr. Valasek's diagnoses of the slides.
- Developed and maintained a database comparing the diagnoses between a physical slide and a digital copy.

University of California, Irvine - Claire Trevor School of the Arts
Irvine, CA

Mechatronics Laboratory Intern
July 2017 - September 2017

- Worked with Professor Simon Penny on the Orthogonal project that attempted to build a self-sailing sailboat, controlled by a radio interface.
- Tasked with physically building the boat and working with Arduino micro-controllers to control a DC motor for autonomy.
- Applied rudder control through various integrated circuits and configured radio communication between wireless nRF modules.

Leadership

American Institute of Chemical Engineers
La Jolla, CA

Project Manager
November 2020 - Present

- Led a team of 7 undergraduate students to research methods of ethanol extraction, as an alternative to distillation.
- Analyzed the advantages and disadvantages of current industry practices regarding ethanol extraction.
- Taught students how to approach an academic research paper and prepare research proposals.

Research Engineer
May 2020 - Present

- Design and build a portable vertical axis wind turbine for on-campus implementation and local STEM outreach.
- Analyze data to determine optimal conditions and parameters for turbine function.

CyberPatriot National Youth Cyber Defense Competition

Placentia, CA

Volunteer Mentor

November 2015 - June 2018

- Specialized in Linux (Ubuntu & Debian) and Cisco Networking.
- Created practice virtual images for the students to hone their skills.
- Contributed to curriculum for securing Windows/Linux workstations/servers, laying foundation for multi-year national semifinalist ranking.
- Taught 70+ middle & high school students how to secure Windows and Linux servers, workstations, and services like Apache and DNS.
- Ranked in top 20 teams nationally and reached national semifinals competition 3 years in a row.

Blind People's Association of India

Ahmdebadad, Gujurat, India

Technology Lab Volunteer

November 2014 - December 2014

- Taught children how to use computers, using a software called Jaws that read commands and screen content.
- Created e-books for college students by scanning hard copies for use by Jaws.
- Assisted visually impaired adults with resumes, job and scholarship applications.

Fullerton Sister City Chinese Exchange Program

Placentia, CA

Student Volunteer

July 2015 - August 2016

- Assisted with language development for Chinese students by conducting various games and activities to help them master the English language, such as writing a professional letter and generating a complex vocabulary through Scrabble.
- Learned about the differences between two cultures and gained various social skills by interacting and communicating with people who spoke a different language.

Skills

Techniques	Cell Culture, Confocal Microscopy, Genotyping, IF Staining, Immunoprecipitation, qRT-PCR, RNA-Seq, Western blot
Languages	Bash, C, C++, Python, Java (including Android), MATLAB, PowerShell, R
Tools/Frameworks	Amazon Web Services, CellProfiler, Fiji, Git, ImageStudio, LaTeX, Linux, Microsoft Office, RStudio, Zeiss ZEN

Honors & Awards

2018	**National Semifinalist**, CyberPatriot X Platinum Tier	*Garden Grove, CA*
2018	**Recipient**, National Merit Commended Scholar	*Placentia, CA*
2018	**Recipient**, AP Scholar with Distinction	*Placentia, CA*
2018 - 21	**Recipient**, UC San Diego Provost Honors	*La Jolla, CA*
2018	**Finalist**, California State University, Fullerton President's Scholarship	*Fullerton, CA*
2018	**Finalist**, California State University, Fullerton University Honors	*Fullerton, CA*
2017	**3rd Place**, California Mayor's Cyber Cup	*Garden Grove, CA*
2017	**1st Place**, Varsity Tennis Empire League	*Placentia, CA*
2017	**Finalist**, Valencia High School Distinguished Scholar	*Placentia, CA*
2016	**Regional Finalist**, CyberPatriot VIII & IX - Gold & Platinum Tiers	*Garden Grove, CA*
2016	**2nd Place**, CyberPatriot VIII Gold Tier State	*Garden Grove, CA*
2015	**Recipient**, California Scholarship Federation	*Placentia, CA*

Writing

The Effects of Digital Piracy on the Economy of the Music Industry

Author

August 2017 - December 2017

- Analyzed the effects of digital piracy on the economy of the global music industry on consumers and produce through several economic models and came to the conclusion that digital piracy has both unique negative and positive consequences.

Personal Projects

Computational Model of Epithelial-Mesenchymal Transition in Breast Cancer

La Jolla, CA

Contributor

April 2020 - Present

- Generated a computational model of a cell with breast cancer undergoing epithelial-mesenchymal transition and associated pathways.

FlyerScanner

La Jolla, CA

Contributor

October 2019

- Used AWS Comprehend ML to analyze photos of event flyers and extract information such as event titles, descriptions, dates, and times.
- Employed open source ical4j library to manage events and generate .ics files for event export, in compliance with iCalendar standard
- Built application for users to enter data into calendar applications for increased productivity, without tedious manual entry

Presentation

SDHacks 2019 *La Jolla, CA*

Presenter *October 2019*

- Introduced and demonstrated the FlyerScanner project developed during SDHacks 2019 for judging.

Relevant Coursework

Honors General Chemistry	Three quarter honors sequence covering quantum mechanics, orbital theory, and bonding.
Organic Chemistry	Three quarter sequence covering organic reactions, bonding theory, and methods of analysis.
General Chemistry Laboratory	Training in analytical, inorganic, physical, and synthetic techniques.
Organic Chemistry Laboratory	Intro to techniques,such as separation, purification, and spectroscopy.
Engineering Computation (MATLAB)	Intro to solution of engineering problems using computational methods.
Material & Energy Balances	Stead & time-based material & energy balances using DOF analysis, kinetics, and equilibrium.
Chemical Engineering Thermodynamics	Thermodynamic behavior of substances, solution properties, and phase equilibrium.
Data Structures for Data Science	Simple Python data structures, recursion, & object-oriented programming.
Data Structures & Algorithms for Data Science	Programming techniques, such as encapsulations, interfaces, and advanced data structures.
Physics: Mechanics	Calculus-based physics covering vectors, motion, work, energy, and rotational kinematics.
Physics: Electricity & Magnetism	Calculus-based physics covering charges, electric fields, capacitors, currents, and resistance.
Physics: Fluids, Waves, & Thermodynamics	Calculus-based physics covering fluid mechanics, sound, entropy, optics, and diffraction.
Physics Laboratory: Electricity & Magnetism	Lab course covering circuits, oscillations, resonance, damping, and magnetic fields.
Calculus & Analytic Geometry	Vector geometry, partial differentiation, double-triple integration, and extrema.
Differential Equations	Ordinary & partial differential equations, Laplace transforms, and series solutions.
Vector Calculus	Change of variables in multiple integrals, line integrals, Taylor series, and surface integrals.
Linear Algebra	Matrix algebra, elimination, eigenvalues & eigenvectors, and MATLAB computational solutions.

Professional Affiliations

2020 - 22 **International Society of Pharmaceutical Engineering**, Project Researcher

2019 - 22 **Data Science Society**, Member

2018 - 22 **American Institute of Chemical Engineers**, Project Manager & Research Engineer

2018 - 22 **Chem-E-Car**, Member

2016 - 18 **Valencia 3-D Printing**, Member

2014 - 18 **International Baccalaureate**, Diploma Recipient

2014 - 18 **Valencia Technology**, Diploma Recipient

2014 - 18 **Valencia Speech & Debate**, Member

2015 - 18 **Air Force Association's CyberPatriot**, Mentor

2014 - 18 **Valencia Varsity Tennis**, Athlete