Samvardhini Sridharan

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EDUCATION

Bachelor of Science in Genetics and Genomics with minors in Statistics and Professional Writing June 2020
University of California, Davis – College of Biological Sciences
Honors Thesis: Topological statistics in genome analysis
PI: Dr. Javier Arsuaga, UC Davis Department of Mathematics and Molecular Cell Biology

RESEARCH EXPERIENCE

Undergraduate Research Associate Jan 19 – Jun 20
Dr. Javier Arsuaga, Professor of Mathematics and Molecular Cell Biology, UC Davis

- Conceived and optimized topological algorithms to quantify the entanglement of the yeast genome
- Employed various bioinformatics toolboxes including Juicer, Juicebox, KnotPlot, PASTIS and programming languages JAVA and Python, and R
- Conducted literature review on the evolutionary path of the Rabl configuration in yeast

Genentech Biological Technologies Summer Intern Jun 19 – Sep 19
Brian Murphy, Manager, Pharma Technical Development, Genentech, South San Francisco

- Assisted in the digital transformation efforts for 20 years of historical assay data
- Employed Python, JAVA, and R to analyze, display, and migrate data from different databases into SQL
- Used Tableau and PowerBI to manage data and create dynamic visualizations
- Created an app to automate paperwork and template filling
- Worked closely with mentors in biotechnology as part of the gLINX (Genentech Leader Intern Exchange), and gained valuable insights on industry research

Undergraduate Research Associate Jul 17 – Jun 19
Alexander Q. Vining, Graduate Student in Animal Behavior, UC Davis

- Developed a simulation-based machine learning (ML) model to identify movement properties of animal leaders, eliminating the need for simultaneous tracking data
- Referenced mathematical models to create an agent-based model in Python
- Used support vector machines, random forest methods and semi-variograms to generate synthetic data
- Participated in data analytics efforts, and used classification algorithms including logistic regression, multivariate regression, and basic model building

Undergraduate Research Associate Jun 17 – Jun 19
Dr. Janet Foley, Professor of Medicine and Epidemiology, UC Davis School of Veterinary Medicine

- Researched the evolutionary history of pathogen *Anaplasma phagocytophilum*
- Utilized bioinformatics and phylogenetic software to generate, determine, and classify host species.
- Tools included MEGA, NCBI BLAST, and CLC
- Applied quantitative tools including Python and Linux OS to create comprehensive and reproducible phylogenetic trees
- Applied basic molecular biology techniques, including PCR, DNA extraction, and gel electrophoresis to generate sequences
- Worked with ArcGIS and other information systems to help create figures for papers and presentations.

Stanford Canary Center Summer Research Intern Jun 18 – Sep18

Dr. Ahmed El Kaffas, Post-Doctoral Research Scholar, Department of Radiology, Stanford University

- Fabricated a biomedical device, "flow phantom" to test ultrasound microbubbles
- Used PDMS and spun sugar (cotton candy) to generate prototypes and molds accurately representing the architecture of blood vessels
- Diluted ethanol solutions to aide in the dissolution of spun sugar in PDMS matrix
- Assisted with radiological data collection efforts, and data processing using R, MATLAB, and Python
- Collected and compiled primary source research papers for the assembly of a review paper

Research Associate in Emergency Medicine Jan 17 – Aug 17

UC Davis School of Medicine, Emergency Department

- Collaborated closely with Research Coordinators at the UC Davis Department of Emergency Medicine to collect patient information for studies in the ER.
- Employed basic data science techniques, including data evaluation and exploratory data analysis.
- Worked with different electronic medical records (EMR) platforms.
- Observed emergency department operations, data collection efforts and patient care.

WRITING EXPERIENCE

Undergraduate Writing Intern, University Writing Program Mar 20 – Present

Ashley Vater, Training Analyst, Innovation Institute for Food and Health, Siegel Lab

- Transitioned a laboratory manual that faculty in an NSF-Funded network are using for integrating enzyme engineering research into the classroom to a collection of Protocols.io protocols.
- Copyedited and made stylistic decisions as fit such that the manual can easily walk students through designing, building, and testing novel mutations to investigate sequence-structure to enzymatic function relationships.
- Supported a **c**ourse-based **u**ndergraduate **r**esearch **e**xperience (CURE) that is set to expand to serve hundreds of students across the US in engaging in enzyme engineering research.
- Applied technical writing, editing, and formatting skills for the new publication venue
- Used creative insight to map the existing content to the new platform

Undergraduate Research Intern, University Writing Program Jan 19 – Jun 19

Dr. Ellen Hartigan-O'Connor, Associate Professor of History, and Associate Dean of Graduate Studies

- Conceptualized and conducted independent research in the Department of History, titled *American Women in Science: A Wikipedia Project*
- Performed extensive library and literature searches of two female scientists in the 20th century
- Collaborated with experts at the UC Davis Shield's Library to communicate with historians at the Smithsonian and Museum of Natural Sciences, New York
- Wrote and edited two Wikipedia pages on research subjects, made necessary edits as part of the peer review process, and shared findings with a cohort of interns

Opinion Columnist, *The California Aggie* Jan 18 – Mar 18

- Wrote ten opinion columns based on topics on science, technology, engineering, and mathematics (STEM) as well as a feature length article "The Big Sick: Films with Minorities Don't Get a Pass"
- Worked directly with writers and editors to revise, edit, and provide feedback for future columns

INVITED TALKS

Sridharan, S., P. Maxime G., and Arsuaga, J. Topological statistics in genome analysis. Oral presentation delivered at the UC Davis Department of Mathematics Research Conference, Davis, CA, October 2019.

Sridharan, S., P. Maxime G., and Arsuaga, J. Topological Statistics in Genome Analysis. Oral presentation delivered at the NSF's Research Training Group Mini-Conference, Davis CA, June 2019.

POSTER PRESENTATIONS AND ABSTRACTS

Sridharan, S., P. Maxime G., and Arsuaga, J. Topological statistics in genome analysis. Oral presentation delivered at the 31st Annual Undergraduate (Virtual) Research Conference, Davis, CA, April 2020.

Sridharan, S., Vining, Alexander. Identifying movement properties of animal leaders using machine learning. Poster presentation at the 30th Annual Undergraduate Research Conference, Davis, CA, April 2019.

Sridharan, S., Vining, Alexander. Identifying movement properties of animal leaders using machine learning. Abstract accepted to the 2018 Women in Machine Learning Workshop, Montreal, QC, Canada, December 2018.

Sridharan, S., El Kaffas, A. Fabrication of a complex flow phantom for 3D Dynamic Contrast Enhanced Ultrasound (3D-DCEUS) imaging using cotton candy. Poster Presentation at the 2018 Canary CREST Poster Symposium, Stanford, CA, August 2018.

Sridharan, S., Foley, J. Comparing evolutionary histories of pathogen *Anaplasma phagocytophilum* in ungulate and non-ungulate species. Poster presentation at the 29th Annual Undergraduate Research Conference, Davis, CA, April 2018.

TEACHING EXPERIENCE

Undergraduate Reader Sep 19 – Jun 19

UC Davis Department of Statistics

- Graded student homework, projects, and quizzes for STA100 (Applied Statistics for Biological Sciences), for over 200 students
- Graded student homework for STA106 (Applied Statistical Methods: Analysis of Variance), for over 120 students
- Interacted closely with professors and Teaching Assistants to develop answer keys and maintain confidential student records.

HONORS

College of Biological Sciences Distinguished Scholar Award/ UC Davis Outstanding Performance Citation, UC Davis, June 2020

College of Biological Sciences, Department Citation, UC Davis, June 2020

1st Prize Recipient, Norma J. Lang Prize for Undergraduate Information Research. Project: *Early Breast Cancer Detection via Novel Radiomics Techniques and Ultrasonography*. UC Davis, May 2019 ($1000)

Aggie Alumni Advancing STEM Award, UC Davis, March 2019. ($1410)

1st Prize Recipient, USBTD/Genentech's Outstanding Student Award Scholarship in Molecular Cell Biology, UC Davis, October 2018 ($2500)

REFERENCES

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