# Sho Sniderman Takeshita

## EDUCATION

***University of Maryland - College Park (UMD)*** Expected May 2024
Majors: Computer Science and Biology GPA: 3.925/4.000 Integrated Life Sciences Honors College

## EXPERIENCE

***Laboratory of Molecular and Thermodynamic Modeling***, Jeffery Klauda January 2023 - Present
Undergraduate Researcher

- Using NAMD to perform molecular dynamic simulations of protein and lipid interactions in alzheimers

***Pfizer Computational Biology Group***, Brent Kuenzi June 2022 - August 2022
Computational Biology Intern

***Center for Bioinformatics and Computational Biology (CBCB)***, Mihai Pop Lab June 2021 - August 2021
CBCB Research Intern, UMD

- Conducted a bioinformatics research project with 1 other intern (See below: Testing Binnacle Coverage Estimation in Projects)
- Learned about De Novo Gene Assembly and Genomic Binning
- Presented research to UMD CBCB

***The Catholic University of America***, Justin Chung Lab June 2019 - August 2019
Research Intern

- Analyzed genes that are co-expressed with Keratin 19 for a bioinformatics project (See below: Keratin 19 Gene Co-Expression Analysis in Projects)
- Presented my project to my lab, research class, and the Washington Junior Academy of Sciences
- Wrote a research paper on Keratin 19 gene Co-Expression Analysis project (https://tinyurl.com/shok19)
- Analyzed scratch assays and merged PI and DAPI stained images with Image J

## PROJECTS

***Enzyme Stability Regression*** (https://tinyurl.com/enzymepred), Data Science December 2022

- Worked with a partner via Colab to determine the melting points of mutated enzymes from a Kaggle dataset
- Used Levenshtein distance to group protein sequences into wildtype groups
- Used PyRosetta library and the relative strain energy formula to determine the risk of unfolding
- Achieved a spearman correlation coefficient of .838 on split test data from the training dataset using a random forest regressor

***Testing Binnacle Coverage Estimation***, Mihai Pop Lab June 2021 - August 2021

- Edited Python code to test 3 different average calculations with 1 intern to optimize Binnacle
- Tested different versions on stool sample data from Human Microbiome Project
- Discovered that using a 10% trimmed mean results in improved contiguity, completeness, and contamination of genomic bins produced

***Detecting Malaria in Cells***, BigTh!nk AI November 2020

- Fine-tuned malaria parasite detection convolutional neural network (CNN) with 1 teammate using Keras and Tensorflow in Google Colab
- Measured 96% accuracy for CNN using a confusion matrix

***Keratin 19 Gene Co-Expression Analysis***, Chung Lab June 2019 - December 2019

- Compiled data of genes coexpressed with K19 from Oncomine and other papers online
- Used DAVID to sort genes based on relation to pathways
- Compared genes expressed in different cell settings and genes in the 4 most significant pathways
- Discovered 124 genes exclusively co-expressed with Keratin 19
- Discovered 1 gene found in all top 4 significant pathways from DAVID analysis

## PROGRAMMING LANGUAGES

Most Experience - Python, Java, OCaml
Some Experience - R, C
Dabbled - JavaScript, MATLAB, Ruby

## TECHNICAL SKILLS

Scikit-learn, PyTorch, Pandas, Numpy, SciPy, Linux, GitHub, Keras, TensorFlow, PyRosetta, Google Colab, NAMD, VMD, HTML, CSS, Slurm, Autodesk Inventor, Excel, PowerPoint, Word

## RELEVANT COURSEWORK **In Progress**

| | |
|---|---|
| Computer Science | **Data Structures**, Machine Learning, Bioinformatic Algorithms, Data Science, Programming Language Technologies and Paradigms, Computer Systems, Organization of Programming Languages, Object-Oriented Programming 1 and 2 |
| Science | Biochemistry, Molecular Genetics, Cell Biology Lectures, Cell Biology, **Physics 1** Organic Chemistry 1 and 2, Genetics and Genomics, Organismal Biology |
| Mathematics | **Design and Analysis of Algorithms**, Algorithms, Discrete Structures, Applied Probability and Statistics, Linear Algebra, AP BC Calculus (Calculus 1 and 2) |

## ACTIVITIES

***Internal Vice President*** 2020 - Present

Japanese American Student Association, University of Maryland

- Planned and lead 5 events for Big/Little Week annually
- Guided and matched 30 Little applicants to Bigs annually
- Interviewed J-rep applicants annually
- Planned and organized 2 retreats for about 20 members

***Project Team*** 2020 - 2021

BigTh!nk AI, University of Maryland

- Learned Python syntax, basic deep learning, and supervised ML concepts
- Worked on Detecting Malaria in Cells project