Nicole Pagane

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https://github.com/npagane

Education

Johns Hopkins University 2015 - 2019
Biophysics B.A. & Space Science and Engineering Minor
3.82 GPA, Deans List (all semesters) & graduated with general honors
Relevant Coursework:
Models and Algorithms in Biophysics, Biological Physics, Statistical Physics and Thermodynamics, Data Structures, Molecular and Cellular Systems Biology, Intermediate Programming, Introduction to Probability, Project in Design: Pharmacokinetics

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Research

Research Assistant in the Risca Lab 2019 - present
Laboratory of Genome Architecture and Dynamics, Rockefeller University
– Building bioinformatic pipelines for data processing and analysis of genomics datasets
– Developing a worm-like chain model of DNA to simulate mesoscale chromatin structures in collaboration with the Spakowitz Lab (Chemical Engineering, Stanford University)
– Investigating the intra and inter-fiber geometries and entanglement of multiple fiber systems that form condensates

Undergraduate Research Assistant in the Roberts Lab 2017 - 2019
Department of Biophysics, Johns Hopkins University
– Used an information theoretic approach to analyze stochastic simulations of yeast cell chemotaxis decision-making processes with the RDME software Lattice Microbes
– Developed a computational chromatin modification model in yeast to study the effects of transcriptional frequency on nucleosome positioning along the linear genome

Summer Intern with the LISA Pathfinder Team 2017
Gravitational Astrophysics Laboratory, NASA Goddard Space Flight Center
– Assisted in constructing a pipeline to detect micrometeorite impacts on the space-based gravitational wave instrument LISA Pathfinder under the mentorship of Dr. Ira Thorpe

Undergraduate Research Assistant in the Marchionni Lab 2016 - 2017
Department of Oncology, Johns Hopkins University School of Medicine
– Curated publicly available omics datasets from GEO for a machine learning study on divergence analysis to create predicative models of cancer diagnosis and prognosis

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Other Work

Lead Software Developer for GermCraft 2018
Department of Biophysics, Johns Hopkins University
– Developed a Meteor web application to teach biophysics and coding through Blockly visual programming to be used in the Biophysics Research for Baltimore Teens program
– Mentored two high school students on front-end development and biophysical concepts

Teaching Assistant for Protein Engineering & Biochemistry Lab 2017 - 2019
Department of Biophysics, Johns Hopkins University
– Prepared stock for lab sections throughout the week and assisted Dr. Carolyn Fitch in material development to refine this exploratory novel protein laboratory course

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Publications

Micrometeoroid Events in LISA Pathfinder
J. I. Thorpe, J. Slutsky, J. Baker, T. Littenberg, S. Hourihane, **N. Pagane**, P. Pokorny, D. Janches, & the LISA Pathfinder Collaboration
The Astrophysical Journal Sep. 2019

Digitizing omics profiles by divergence from a baseline
W. Dinalankara, Q. Ke, Y. Xu, L. Ji, **N. Pagane**, A. Lien, T. Matam, E. Fertig, N. Price, L.Younes, L. Marchionni, D. Geman
Proceedings of the National Academy of Sciences Apr. 2018

Police Reform versus Abolition: A Numbers Perspective
Nicole Pagane
Medium Jul. 2020

Presentations
∗ = poster
† = talk

Coarse-graining DNA mechanics to study mesoscale chromatin geometries and interdigitation
† Joint Mathematics Meeting AMS Special Session Jan. 2021
† Asilomar Chromatin, Chromosomes, and Epigenetics *(submitted abstract)* Dec. 2020

Computational biology and the Risca lab
† RockEDU Science Cafe Series for High School Students Jul. 2020

Optimal hospital selection for EMS transport of COVID-19 patients
† Johns Hopkins CBID COVID-19 Design Challenge Mar. 2020

Probing mesoscale chromatin structure: bridging experiment and theory with computation
∗ Tri-Institutional Computational Biology & Medicine Open House Feb. 2020

The 'fragile' nucleosome and RICC-seq in mouse embryonic stem cells
∗ Stem Cells, Development, and Cancer Retreat at Rockefeller University Sep. 2019

Nucleosome dynamics: modulating repair and transcriptional frequency
∗ Johns Hopkins Biophysics Undergraduate Research Festival May 2019

Micrometeorite science with LISA Pathfinder
∗ 231st American Astronomical Society Meeting, Washington D.C. Jan. 2018
∗ NASA Goddard Space Flight Center Summer Intern Research Symposium Aug. 2017

Technical Proficiencies
Python, Fortran, Linux, C, C++, Git, MATLAB/GNU Octave, Java, R, JavaScript, HTML, CSS, Mathematica, PyMOL, LaTeX, Lattice Microbes, Meteor Web Apps, Slurm

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Other Experiences

Intern with the Correctional Association of New York 2019 - present
Computational consultant under the guidance of Evan Misshula
– Optimized a web scraper application to monitor and assess the location and well-being of New York state inmates

Coordinator and Camp Counselor with Camp Kesem 2017 - 2019
Volunteer & Outreach Coordinator with Camp Kesem at Johns Hopkins University
– Summer camp counselor for children (aged 6-18) who have a parent affected by cancer
– Led volunteer recruitment, counselor selection and training, and general body meetings
– Promoted awareness of our services to the Baltimore community and acted as a main point of contact for the organization

Significant computational side projects
– Analyzed NYPD arrest data with mechanistic modeling to quantitatively explore and compare theories of police reform and abolition Jul. 2020
– Wrote a script to automate the generation of SARS-CoV-2 testing reports to enable Rockefeller University to scale up their COVID-19 testing abilities Jun. 2020
– Simulated the transport of COVID-19 patients to develop and benchmark different EMS response strategies, as part of the JHU CBID Design Challenge Mar. 2020