Curriculum Vitae

Jennifer Lu

Position: Ph.D. candidate
Steven Salzberg lab
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EDUCATION

08/2015 – Present
Ph.D. Candidate in the Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD. Researching the usage of next-generation sequencing for diagnosing bacterial, fungal, or viral infections in human corneal and brain samples. Analyzing microbial DNA sequence complexities, similarities, and contamination. Thesis Advisor: Dr. Steven Salzberg

09/2011 – 12/2014
Bachelors of Science in Chemical and Biomolecular Engineering from Johns Hopkins University, Baltimore, MD. GPA 3.87/4.00 Minored in Computer Science

RESEARCH EXPERIENCE

08/2014 – 04/2015
Student Researcher for Dr. Rebecca Schulman's Nanotechnology Lab at Johns Hopkins University, Baltimore, MD. Evaluated the design, assembly, and fabrication of DNA-origami structures. Assessed the kinetics of dimer formation between DNA-origami structures.

05/2012 – 08/2012
Student Intern for the Laboratory of Receptor Biology and Gene Expression at the NIH, NCI, Bethesda, MD. Research on various Chromosome Conformation Capture experiments and the experimental biases present in Hi-C experiments. Developed programs in Perl and R to transform and analyze data produced in Hi-C experiments.

05/2014 – 12/2014
Student Intern for Dr. Navin Varadarajan's Single Cell Lab, at the University of Houston, Houston, TX. Developed an interface in Python allowing users to process and store microscopy data from single-cell assays while quantifying intercellular interactions in each assay. Employed the MySQL database system to store microscopy data for future analysis.

01/2013 – 11/2013
Student Researcher for Dr. Jeffrey Gray's Rosetta Lab at Johns Hopkins University, Baltimore, MD. Developed a Python-based interface to allow accelerated and automated benchmarking of protein modeling scripts.

WORK AND VOLUNTEER EXPERIENCE

10/2015 – Present
Thread Volunteer, Head of Family, and Grandparent, Baltimore, MD. Engaged with underperforming high school students, encouraging improved academic achievement and personal growth. Coordinated a "family" of volunteers to provide a network of support for Baltimore City high school students. Motivated relationships between volunteers and students.

09/2017 – Present
Teaching Assistant for Statistical Mechanics and Thermodynamics at Johns Hopkins University, Baltimore, MD. Class taught by Dr. Michael Beer. Taught weekly section classes of smaller groups, engaging students in understanding statistical mechanics and thermodynamics and their application in biological systems.

02/2017 – 05/2017
Teaching Assistant for Introduction to Genomic Research at Johns Hopkins University, Baltimore, MD. Class taught by Dr. Steven Salzberg. Guided students in learning Unix commands and python coding. Introduced students to the concepts of genomic assembly, metagenomic sample analysis, DNA sequencing technology, RNA-seq, and various alignment algorithms and technologies. Specifically guided students in using programs such as the SPAdes assembler, MUMmer aligner tool, Kraken classifier, Centrifuge classifier, Bowtie aligner, TopHat and HISAT spliced aligners, and StringTie assembler.

09/2013 – 12/2013
Classroom Assistant for Immediate Programming at Johns Hopkins University, Baltimore, MD. Class taught by Dr. Yair Amir. Assisted students with the development of data structures and programs in the programming languages of C and C++ while teaching students about C/C++ memory management and code development

10/2011 – 05/2015
Classroom Audio/Visual Technician at Johns Hopkins University, Baltimore, MD. Provided technical support for professors using the Johns Hopkins technology-enhanced classrooms. Distributed and managed audio and visual equipment for guest speakers, professors, and performances throughout the Johns Hopkins campus in both classroom and auditorium settings.

PUBLICATIONS

SUBMITTED

Z. Li, F. P. Breitwieser, **J. Lu,** A. S. Jun, S. L. Salzberg, C. G. Eberhart. *(awaiting review)*. "Diagnosing corneal infections in formalin fixed specimens using next generation sequencing." *Ophthalmology*.

FIRST AUTHORED, PEER-REVIEWED PUBLICATIONS

J. Lu, F. P. Breitwieser, P. Thielen, S. L. Salzberg, (2017). "Bracken: estimating species abundance in metagenomics data." *PeerJ Computer Science*, 3:e104 https://doi.org/10.7717/peerj-cs.104

CO-AUTHORED, PEER-REVIEWED PUBLICATIONS

F.P. Breitwieser, **J. Lu,** S.L. Salzberg, (2017). "A review of methods and databases for metagenomic classification and assembly." *Briefings in Bioinformatics*, bbx120 https://doi.org/10.1093/bib/bbx120

J. Fern, **J. Lu,** R. Schulman, (2016). "The Energy Landscape for the Self-Assembly of a Two-Dimensional DNA Origami Complex." *ACS Nano,* 10(2), 1836-1844.

A. Merouane, N. Rey-Villamizar, Y. Lu, I. Liadi, G. Romain, J.S. Lee, **J. Lu**, A. Rao, N. Varadarajan, B. Roysam. (2015). "Automated Profiling of Individual Cell-Cell Interactions from High-throughput Time-lapse Imaging Microscopy in Nanowell Grids (TIMING)". *Journal of Bioinformatics,* 31(19), 3189-3197.

PRESENTATIONS

J. Lu, F. P. Breitwieser, S.L. Salzberg. (05/12/2017). "Improving draft genomes of human pathogens for use in metagenomic studies", Presented at the Biology of Genomes Conference, Cold Spring Harbor Laboratory, NY.

J. Lu (01/2017) "Bracken: Bayesian Reestimation of Abundance with KrakEN" Presented at the bi-weekly Joint Biostats-Genomics Lab Meeting, Johns Hopkins University, Baltimore, MD.

J. Lu, N. Varadarajan, B. Roysam. (07/2014). "Bioinformatics of Single Cell Microscopy." Presented at the University of Houston Research Experience for Undergraduates Poster Session, Houston, TX.

SKILLS

SOFTWARE ENGINEERING

Operating Systems	Linux/Unix, Microsoft Windows XP, 7-10, Mac OS X
Programming Languages	C, C++, Python, Perl, R, Java, MATLAB®, LaTeX, HTML
Databases	MySQL

LABORATORY SKILLS

Proficient in general laboratory skills, spectrophotometry, PCR and microscopy
Limited training in plasmid DNA isolation and gel electrophoresis

LANGUAGES

English (native), Chinese (conversational), Spanish (conversational)