Shilpa Nadimpalli Kobren

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Education

2018 **Ph.D. in Computer Science** • Princeton University
Thesis: Detecting and Analyzing Variation in Protein Interaction Interfaces
Advisor: Mona Singh

2013 **M.Sc. in Computer Science** • Princeton University

2011 **B.Sc. in Biology & Computer Science**, *summa cum laude* • Tufts University
Thesis, Awarded Highest Honors: Correcting Protein Multiple Structural Alignments by Sequence Peeking
Advisor: Lenore Cowen

Awards & Honors

08/2015 **Siebel Scholar, Class of 2016** *awarded annually for academic excellence and demonstrated leadership to 93 top students from the world's leading graduate schools*

09/2011–09/2015 **NSF Graduate Research Fellowship** *for graduate study in STEM disciplines*

09/2011–09/2015 **Princeton Gordon Wu Fellowship** *for engineering graduate study*

05/2011 **Tufts James Schmolze Award** *for top undergraduate achievement in computer science*

05/2010 **Google Anita Borg Memorial Scholarship** *for women in computer science*

08/2007–05/2011 Tufts Neubauer Scholarship *for aptitude in research; grants to fully cover all four years of undergraduate student loans (1 in 10 of ∼1500)*

04/2011 Tufts Class of 1882 Prize Scholarship *for intellectual leadership (1 in 4 of ∼5000)*

04/2010 Tufts Audrey Butvay Gruss Award *for scientific achievement (1 in 4 of ∼5000)*

06/2009–10/2009 CRA-W/CDC Distributed Research Experiences for Undergraduates Fellowship

09/2008–05/2009 CRA-W Multidisciplinary Research Opportunities for Women Fellowship

06/2008–09/2008 NSF/NIH Southern California Bioinformatics Summer Institute Fellowship

05/2006 Massachusetts State Science Fair, 1st Place Award

Publications

2018 **SN Kobren**, B Chazelle, M Singh. (2018). "An integrative approach to identify preferentially altered interactions in human cancers." *Manuscript resubmission imminent.*

2018 **SN Kobren**, M Singh. (2018). "Systematic domain-based aggregation of protein structures highlights DNA-, RNA- and other ligand-binding positions." *Nucleic Acids Research*. in press: gky1224.

2015 **S Nadimpalli**, AV Persikov, M Singh. (2015). "Pervasive variation of transcription factor orthologs contributes to regulatory network divergence." *PLoS Genetics*. 11: e1005011.

2012 N Daniels, **S Nadimpalli**, L Cowen. (2012). "Formatt: Correcting protein structural alignments by incorporating sequence alignment." *BMC Bioinformatics*. 13: 259–266.

2011 **S Nadimpalli***, N Daniels*, L Cowen. (2011). "Formatt: Correcting protein structural alignments by sequence peeking." *Proceedings of the 2011 ACM Conference on Bioinformatics, Computational Biology, and Biomedicine*. 2: 315–319.

2009 J Rieffel, F Sauders, **S Nadimpalli**, H Zhou, S Hassoun, J Rife, B Trimmer. (2009). "Evolving soft robotic locomotion in PhysX." *Proceedings of the 2009 ACM Conference on Genetic and Evolutionary Computation*. 2: 315–319.

Research & Work Experience

08/2018 – Present **Postdoctoral Research Fellow**, Harvard Medical School • *Boston, MA*
Developing translational bioinformatics applications that combine insights from genomics data and electronic health records to improve diagnoses of rare diseases under Dr. Isaac S. Kohane

03/2012–06/2018 **Graduate Research Assistant**, Princeton University • *Princeton, NJ*
"Detecting and Analyzing Variation in Protein Interaction Interfaces"
Investigated the evolution, natural variation, and disease-related mutation of cellular networks through analysis of protein interaction interfaces under Prof. Mona Singh

Undergraduate Research Assistant, Tufts University • *Medford, MA*

01/2010–05/2011 *"Formatt: Correcting Protein Multiple Structural Alignments by Sequence Peeking"*
Improved the Matt protein structural aligner by incorporating a sequence alignment correction step and validating using objective measures under Prof. Lenore J. Cowen

09/2008–05/2009 *"Modeling the Neuro-Mechanical Control of a Soft-Tissue Organism"*
Evolved a solution representing the firing of neurons for muscle contraction using genetic algorithms to successfully elicit motion in a SoftBot under Prof. Soha Hassoun

06/2009–10/2009 **Summer Intern, Bioinformatics Dept**, Virginia Tech • *Blacksburg, VA*
"Cataloging Animal Retrocopies for Retrotransposon Model"
Developed a genome annotation independent algorithm to identify and classify retrocopies and chimeric genes given a transcriptome under Prof. Liqing Zhang

06/2008–09/2008 **Summer Intern, Biochemistry Dept**, University of California, Los Angeles • *Westwood, CA*
"Discovery of Novel Metabolic Types of Bacterial Microcompartments"
Implemented a pipeline to analyze oceanic metagenomic sequencing data for bacterial microcompartment (BMC) shell proteins to identify potentially novel metabolic BMC types under Prof. Todd Yeates

05/2007–08/2007 **Summer Intern, Preclinical Dept**, Shire Pharmaceuticals • *Cambridge & Lexington, MA*
Set up a secure database containing clinical and research reports for drugs in production or under testing.

06/2006–09/2006 **Summer Intern, Microbiology Dept**, Univ. of Massachusetts Medical School • *Worcester, MA*
"Identification of Genes Involved in Expansion of Chromosomal Repeat in E. Coli"
Developed a series of knockout bacterial strains and tested viability of bacteria and amplification of a specific chromosomal repeat under Prof. Anthony Poteete

Teaching & Mentoring Experience

11/15/2018 **Guest Lecturer in Computational Biology**, Tufts University • *Medford, MA*
Gave 1-hour lecture on DNA motif finding algorithms to undergraduate and graduate students in *CS167*.

01/2016–02/2017 **Mentor for First-Year Graduate Students**, Princeton University • *Princeton, NJ*
Spring 2016 Coadvised Computational Biology student project on finding functional domain positions
Fall 2016 Coadvised Computer Science student project on uncovering protein binding pocket mutations

06/2013–07/2013 **Mentor for Undergraduate Students**, Princeton University • *Princeton, NJ*
Summer 2013 Co-advised three undergraduates on a summer project through the Summer Programming Experiences program to build a secure voting mobile application

09/2012–05/2013 **Assistant Instructor**, Princeton University • *Princeton, NJ*
Fall 2012 & Spring 2013 Taught precepts twice weekly for *COS126: General Computer Science*, held office hours (∼10 hours/week), graded assignments and proctored midterm and final exams.
*Top rated (4.5/5 on average) by students for all precepts taught over both semesters.

09/2009–05/2010 **Teaching Assistant**, Tufts University • *Medford, MA*
Fall 2009 & Spring 2010 Attended lectures, assisted in labs, held office hours (∼10-18 hours/week) and graded assignments for two courses *CS40: Machine Structure and Assembly Language Programming* and *CS80: Programming Languages*.

02/2009–06/2009 **High School Bioinformatics Instructor**, Somerville High School • *Somerville, MA*
Analyzed soil metagenomic data to discover new microbes and led four spring seminars for students about gene sequencing and alignment algorithms. Project funded via an HHMI ARRAYS grant.

Presentations

Invited Talks

10/25/2018 Computational approaches for uncovering disease-relevant variation in protein interactions, *'Rising Stars in Computer Science' Symposium at Tufts University, Medford, MA*

03/08/2018 Data-driven approaches for uncovering functional variation in protein interactions, *Harvard Medical School, Department of Biomedical Informatics, Open Insights Seminar Series, Boston, MA*

01/09/2018 Data-driven approaches for uncovering functional variation in protein interactions, *Flatiron Institute, Center for Computational Biology (CCB), New York City, NY*

11/03/2017 Integrative approaches to discover preferentially altered interactions in cancer, *Lewis-Sigler Institute for Integrative Genomics 2017 Retreat, Princeton, NJ*

09/26/2017 Data-driven approaches for discovering perturbed interaction interfaces in cancer, *University of Massachusetts Data Science Seminar Series, Amherst, MA*

09/13/2017 Data-driven approaches for discovering perturbed interaction interfaces in cancer, *'Rising Stars in Data Science' Symposium at UChicago, Chicago, IL*

01/06/2017 Discovery of rare cancer driver mutations affecting protein interaction interfaces, *Princeton Area Alumni Association First Friday Series, Princeton, NJ*

01/06/2016 Pervasive variation of TF orthologs contributes to regulatory network divergence, *Icahn Institute Think & Drink Symposium, Princeton, NJ*

Platform Presentations

08/02/2017 Structure-informed approach to discovering perturbed interaction interfaces in cancer, *NY Area Meeting in Quantitative Biology, Cold Spring Harbor, NY*

04/02/2011 Formatt: Correcting protein structural alignments by incorporating sequence homology, *Tufts 13th Annual Undergraduate Research Symposium, Medford, MA*

Posters

11/15/2015 Pervasive variation of transcription factor orthologs contributes to regulatory network divergence, *RECOMB/ISCB Conference on Regulatory and Systems Genomics, Philadelphia, PA*

03/20/2014 Pervasive binding specificity variation of Cys_2-His_2 zinc finger orthologs suggests trans mutations as major drivers of regulatory network divergence, *Systems Biology Meeting: Global Regulation of Gene Expression, Cold Spring Harbor, NY*

04/09/2011 Formatt: Correcting protein structural alignments by sequence peeking, *3rd Annual New England Undergraduate Computing Symposium, Boston, MA*

10/09/2009 Cataloging Animal Retrocopies: An Annotation-Independent Methodology, *Midwest Women in Computing Conference, Chicago, IL*

Panels

08/22/2017 Women in Bioinformatics (WiB), *ACM Conference on Bioinformatics, Computational Biology, and Biomedicine, Boston, MA*

10/02/2015 Questions about Going to Graduate School in Computer Science, *Department of Computer Science at Princeton University, Princeton, NJ*

03/28/2013 Getting More Out of Office Hours, *Princeton University McGraw Teaching Center, Princeton, NJ*

04/09/2011 Graduate School Application Process and Visit Experience, *3rd Annual New England Undergraduate Computing Symposium, Boston, MA*

Service & Outreach

08/2017 **ACM BCB'17 Student Activity Co-Chair** and referee, *Boston, Massachusetts, USA*

05/2017 **RECOMB 2017 referee**, *Hong Kong*

07/2010, 07/2014 **ISMB 2010 & 2014 Student Volunteer** and referee, *Boston, Massachusetts, USA*

05/2012–02/2015 **Princeton Graduate Student Government**, *Computer Science Representative, Events Board Member*

07/2012–05/2014 **Princeton Jewish Graduate Students and Young Professionals**, *President*

09/2011–05/2018 Princeton Graduate Women in Science and Engineering, *Mentoring Program Participant*

08/2011–Present Tufts Alumni Admissions Program, *Applicant Interviewer*

09/2008–05/2011 Tufts Admissions Office, *April Open House Host, Voices Host, Speaker at Engineering Open House*

09/2007–05/2011 Tufts Association for Computing Machinery, Women, *Mentor & Outreach Contact*