

# Shilpa Nadimpalli Kobren

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Currently seeking a position as a postdoctoral researcher in the Boston or New York City areas.

## Education

- exp. 2017 **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

- 2017 **SN Kobren**, B Chazelle, M Singh. (2017). "An integrative approach to identify preferentially altered interactions in human cancers." *Manuscript under review*.
- 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). "Format: Correcting protein structural alignments by incorporating sequence alignment." *BMC Bioinformatics*. 13: 259–266
- 2011 **S Nadimpalli\***, N Daniels\*, L Cowen. (2011). "Format: 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

- 03/2012 – Present **Graduate Research Assistant**, Princeton University • *Princeton, NJ*  
*“Detecting and Analyzing Variation in Protein Interaction Interfaces”*  
Investigating 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 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

- 01/2016–02/2017 **Mentor for First-Year Graduate Students**, Princeton University • *Princeton, NJ*  
*Spring 2016* Quantitative & Computational Biology graduate student project: “Identifying functional protein domain positions using population variation data”  
*Fall 2016* Computer Science graduate student project: “Framework for structural integration of nonsynonymous mutations in protein binding pockets”
- 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 *Illumina*-sequenced soil metagenomic data to discover new soil microbes, and led four spring seminars for Somerville High School students about gene sequencing, alignment algorithms, and BLAST. Project funded via a Tufts University Chemistry Department HHMI ARRAYS grant.

## Presentations

### Invited Talks

- 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<sub>2</sub>-His<sub>2</sub> 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, *ACM Conference on Bioinformatics, Computational Biology, and Biomedicine, Boston, Massachusetts*
- 05/2017 **RECOMB 2017 referee**, *21st Annual International Conference on Research in Computational Molecular Biology, Hong Kong*
- 07/2010, 07/2014 **ISMB 2010 & 2014 Student Volunteer** and referee, *International Conference on Intelligent Systems for Molecular Biology, Boston, Massachusetts*
- 05/2012–02/2015 **Princeton Graduate Student Government**, *Computer Science Representative, Events Board Member*
- 09/2011–Present Princeton Graduate Women in Science and Engineering, *Mentoring Program Participant*
- 08/2011–Present Tufts Alumni Admissions Program, *Applicant Interviewer*
- 07/2012–05/2014 Princeton Jewish Graduate Students and Young Professionals, *President, Coordinator*
- 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*

References available upon request.