# Abhinav Nellore

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*I am a computational biologist interested in systematically cataloging human genetic variation to develop metrics for distinguishing important variation from unimportant variation. The underlying questions that excite me are: how can we effectively quantify the information compressed and encoded in human DNA? How many distinct "expression states" are realized under the umbrella of human variation, across cell types and populations? To help address these questions, I develop and deploy tools for performing integrative analyses of many high-throughput sequencing samples.*

## Experience

**DEPTS. OF *BIOSTATISTICS* AND *COMPUTER SCIENCE*** **2013-PRESENT**
**JOHNS HOPKINS UNIVERSITY (BALTIMORE, MD)**
**POSTDOCTORAL SCHOLAR BETWEEN LABS OF BEN LANGMEAD AND JEFF LEEK**

My research has focused on developing and deploying scalable software called Rail-RNA for integrative analysis of thousands of RNA sequencing samples. Visit http://rail.bio for more information.

**DEPT. OF *HUMAN GENETICS*** **2012-2013**
**UNIVERSITY OF CALIFORNIA, SAN FRANCISCO (SAN FRANCISCO, CA)**
**POSTDOCTORAL SCHOLAR, JUN S. SONG'S LAB**

I participated in writing software for identifying nucleosome positions from MNase-seq data (NSeq) and performing quality control of ChIP-seq data (CHANCE) in **Java** and **Matlab**, respectively. I also did published research involving 1) the mechanisms underlying the development of melanoma, and 2) lncRNAs in neural stem cells of mice.

**JIFF, INC. (PALO ALTO, CA)** **2011**
**MOBILE APP DEVELOPER**

I coded part of JiffPad (language: **Objective-C**), an iPad app that helps doctors create teaching materials for their patients. JiffPad was presented at TechCrunch Disrupt SF 2011's Startup Battlefield and was available in the App Store through 2012.

**PRINCETON CONSULTANTS (PRINCETON, NJ)** **2010-2011**
**SENIOR ASSOCIATE**

NetJets is a fractional jet company; instead of buying their own jets and hiring their own flight crews, NetJets customers buy fractions of crewed jets and make flight reservations shortly before takeoff. This poses a large-scale optimization problem: how can one schedule flights and assign crews to minimize operational costs? I maintained software written in **Java** and **C#** that solves this problem.

## Education

**DOCTOR OF PHILOSOPHY, PHYSICS (STRING THEORY)** **2010**
**PRINCETON UNIVERSITY (PRINCETON, NJ)**

Thesis: Applications of the gauge/gravity duality
Adviser: Steven S. Gubser

**BACHELOR OF SCIENCE, PHYSICS** **2005**
**UNIVERSITY OF MARYLAND, COLLEGE PARK**

Thesis: Quantizing exotic states in *SU(3)* soliton models
Adviser: Thomas D. Cohen
GPA: 3.925 (graduated with high honors)

## Awards

Postdoctoral Poster Award (for NSeq), UCSF Biomedical Sciences, 2012
Princeton University Department of Physics Teaching Award, 2010
Princeton University Centennial Fellowship, 2005-2010
National Defense Science and Engineering Graduate Fellowship (NDSEG), 2005-2008

## Talks

1. *An analysis of splicing variation across the sequence read archive with Rail-RNA*. Genome Informatics, Cold Spring Harbor Lab, October 2015.

2. *Rail-RNA: analyzing many RNA sequencing samples with Elastic MapReduce*. Amazon Web Services Public Sector Symposium, Washington, DC, June 2015.

3. *Scalable and integrative analysis of many RNA sequencing samples with Rail-RNA*. Center for Computational Genomics, Johns Hopkins University, April 2015.

4. *Scalable software for analyzing many RNA sequencing samples*. Young Investigators Symposium, Johns Hopkins University, October 2014.

**Below, my name is highlighted in fields where authorship order is relevant.**

## Preprints

1. **A Nellore**, A Jaffe, J Fortin, J Alquicira-Hernández, L Collado-Torres, S Wang, R A Phillips, N Karbhari, K D Hansen, B Langmead. "Human splicing diversity across the Sequence Read Archive," bioRxiv; http://dx.doi.org/10.1101/038224 (**computational biology**)

2. **A Nellore**, C Wilks, K D Hansen, J T Leek, B Langmead. "Rail-dbGaP: a protocol and tool for analyzing protected genomic data in a commercial cloud," bioRxiv; http://dx.doi.org/10.1101/035287 (**computational biology**)

3. **A Nellore**, L Collado-Torres, A Jaffe, J Morton, J Alquicira-Hernández, J T Leek, B Langmead. "Rail-RNA: scalable analysis of RNA-seq splicing and coverage," bioRxiv; http://dx.doi.org/10.1101/019067 (**computational biology**)

## Publications

4. **A Nellore** and R Ward. "Recovery guarantees for exemplar-based clustering," *Information and Computation*, vol. 245, October 2015, pages 165-180 (**machine learning**)

5. A Ramos, A Diaz*, **A Nellore***, R Delgado, K-Y Park, G Gozales-Roybal, M Oldham, J S Song, and D Lim. "Integration of genome-wide approaches identifies lncRNAs of adult neural stem cells and their progeny in vivo," *Cell Stem Cell*, vol. 12, issue 5, 2 May 2013, pages 616-628 (**computational biology**; *equal contribution)

6. R Haq, J Shoag, P Andreu-Perez, S Yokoyama, H Edelman, G Row, D Frederick, A Hurley, **A Nellore**, A Kung, J Wargo, J S Song, D Fisher, Z Arany, and H Widlund. "Oncogenic BRAF regulates oxidative metabolism via PGC1a and MITF," *Cancer Cell*, vol. 23, issue 3, 18 March 2013, pages 302-315 (**computational biology**)

7. **A Nellore**, K Bobkov, E Howe, A Pankov, A Diaz, and J S Song. "NSeq: a multithreaded Java application for finding positioned nucleosomes from sequencing data," *Frontiers in Genetics*, vol. 3, 11 January 2013 (**computational biology**)

8. A Diaz, **A Nellore**, and J S Song. "CHANCE: comprehensive software for quality control and validation of ChIP-seq data," *Genome Biology*, vol. 13, 15 October 2013, pages R98 (**computational biology**)

9. A Nellore. "Applications of the gauge/gravity duality," thesis at Princeton University, September 2010 (**string theory**)

10. S S Gubser and A Nellore. "Ground states of holographic superconductors," *Physical Review D*, vol. 80, issue 10, 11 November 2009 (**string theory**)

11. A Cherman and A Nellore. "Universal relations of transport coefficients from holography," *Physical Review D*, vol. 80, issue 6, 9 September 2009 (**string theory**)

12. A Cherman, T Cohen, and A Nellore. "Bound on the speed of sound from holography," *Physical Review D*, vol. 80, issue 6, 3 September 2009 (**string theory**)

13. S S Gubser and A Nellore. "Low-temperature behavior of the Abelian Higgs model in anti-de Sitter space," *Journal of High Energy Physics*, vol. 2009, page 8, 1 April 2009 (**string theory**)

14. S S Gubser and A Nellore. "Mimicking the QCD equation of state with a dual black hole," *Physical Review D*, vol. 78, issue 8, 29 October 2008 (**string theory**)

15. S S Gubser, A Nellore, S S Pufu, and F D Rocha. "Thermodynamics and bulk viscosity of approximate black-hole duals to finite-temperature quantum chromodynamics," *Physical Review Letters*, vol. 101, issue 13, 23 September 2008 (**string theory**)

16. A Cherman, T D Cohen, and A Nellore. "Quantization of exotic states in SU(3) soliton models: a solvable quantum mechanical analog," *Physical Review D*, vol. 70, issue 5, 11 November 2004 (**nuclear theory**)

17. T D Cohen, D C Dakin, R F Lebed, and A Nellore. "Pion-nucleon scattering relations at next-to-leading order in 1/N," *Physical Review D*, vol. 69, issue 5, 16 September 2004 (**nuclear theory**)

18. T D Cohen, D C Dakin, A Nellore, and R F Lebed. "Excited baryon decay widths in large N QCD," *Physical Review D*, vol. 69, issue 5, 1 March 2004 (**nuclear theory**)

19. G Oskam, **A Nellore**, R L Penn, and P C Searson. "The growth kinetics of TiO2 nanoparticles from titanium (IV) alkoxide at high water/titanium ratio, *The Journal of Physical Chemistry B*, vol. 107, issue 8, pages 1734-1738 (**materials science**)