Princy Parsana

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Current position

2014 - 2020 (expected)	**PhD candidate**, *Computer Science*, Johns Hopkins University, USA.

Education

2013	**MS Bioinformatics**, *Johns Hopkins University*, USA.
2011	**B.Tech, M.Tech Integrated Biotechnology**, *Padmashree Dr. D.Y. Patil University*, India.

Research Experience

2014-Present — **Graduate Research Assistant**, *Department of Computer Science*, Johns Hopkins University, USA.

Advisor: Dr. Alexis Battle; Co-advisor: Dr. Kenneth Pienta

Developed methods and designed analysis to understand the genetic and molecular basis of transcriptional regulation and disease can be found below:

- Gene co-expression and regulatory networks
  - Impact of known and latent artifacts in gene expression on reconstruction of gene co-expression networks [1] {sva_network} - collaboration with Dr. Jeffrey Leek
  - Network based prediction and subtyping models for diseases – application in Prostate cancer
  - Leverage co-expression networks to identify functional & regulatory genetic variants – application in Autism Spectrum Disorder
- Effective utilization of publicly available gene expression resources
  - Develop methods for systematic use of public RNAseq data from $recount$ project ($> 70,000$ RNAseq samples) for reconstruction of co-expression and regulatory networks
  - Designed approach for integration of gene expression data from multiple small sample cancer cell line studies across different tissue types to identify global expression patterns of metastasis [6]
- Genetic effects on gene expression in human tissues As a part of Battle lab, I've had the opportunity to be on analysis working group of the GTEx consortium.
  - Understand the functional basis and mediation of trans-eQTLs effects (trans regulatory variants), co-lead analyst [5]
  - Identify sex-biased allele specific expression across human tissues

2013 - 2014	**Sr. Research Data Analyst**, *Department of Urology*, Johns Hopkins University School of Medicine, USA.
	PI: Dr. Kenneth Pienta
Summer 2013	**Summer Research Assistant**, *Harvard School of Public Health*, USA.
	Advisors: Curtis Huttenhower, Giovanni Parmigiani; Mentor: Levi Waldron
	○ Created curatedCRCData - a Bioconductor package that provides manually curated data collection for gene expression meta-analysis of patients with colorectal cancer. [4]
2012 - 2013	**Graduate Research Assistant**, *Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins*, USA.
	Advisor: Stephen Baylin; Mentor: Hariharan Easwaran
	○ Co-designed pipeline to identify DNA methylation signatures in response to Azacytidine treatment in Non-Small Cell Lung Cancer cell lines treated. [12]
Summer 2012	**Graduate Student Intern**, *Dana Farber Cancer Institute*, USA.
	Advisors: Curtis Huttenhower, Giovanni Parmigiani; Mentor: Levi Waldron
	○ netPCA - developed a principal component based network method for disease subtyping in colorectal cancer [4]

Relevant Coursework

CS & ML	Introduction to Machine Learning, Probabilistic Graphical Models, Algorithms, Database systems
Computational Biology	Computational Molecular Medicine, Computational Genomics

Skills

R, Python, Unix, Bash

Machine learning, statistical modeling, data analysis

LaTeX

Publications

[1] Princy Parsana, Claire Ruberman, Andrew E Jaffe, Michael C Schatz, Alexis Battle, and Jeffrey T Leek. Addressing confounding artifacts in reconstruction of gene co-expression networks. *Genome biology*, 20(1):94, 2019.

[2] Haley D Axelrod, Kenneth C Valkenburg, Sarah R Amend, Jessica L Hicks, Princy Parsana, Gonzalo Torga, Angelo M DeMarzo, and Kenneth J Pienta. Axl is a putative tumor suppressor and dormancy regulator in prostate cancer. *Molecular Cancer Research*, 17(2):356–369, 2019.

[3] Sridhar Nimmagadda, Mrudula Pullambhatla, Ying Chen, Princy Parsana, Ala Lisok, Samit Chatterjee, Ronnie Mease, Steven P Rowe, Shawn Lupold, Kenneth J Pienta, et al. Low-level endogenous psma expression in non-

prostatic tumor xenografts is sufficient for in vivo tumor targeting and imaging. *Journal of Nuclear Medicine*, 59(3):486–493, 2018.

[4] Siyuan Ma, Shuji Ogino, Princy Parsana, Reiko Nishihara, Zhirong Qian, Jeanne Shen, Kosuke Mima, Yohei Masugi, Yin Cao, Jonathan A Nowak, et al. Continuity of transcriptomes among colorectal cancer subtypes based on meta-analysis. *Genome biology*, 19(1):142, 2018.

[5] GTEx Consortium **(Co-Lead Analyst)**. Genetic effects on gene expression across human tissues. *Nature*, 550, 2017.

[6] Princy Parsana, Sarah R. Amend, James Hernandez, Kenneth J. Pienta, and Alexis Battle. Identifying global expression patterns and key regulators in epithelial to mesenchymal transition through multi-study integration. *BMC Cancer*, 2017.

[7] Yusuke Shiozawa, Janice E Berry, Matthew R Eber, Younghun Jung, Kenji Yumoto, Frank C Cackowski, Hyeun Joong Yoon, Princy Parsana, Rohit Mehra, Jingcheng Wang, et al. The marrow niche controls the cancer stem cell phenotype of disseminated prostate cancer. *Oncotarget*, 7(27):41217, 2016.

[8] Kimberly R Kukurba, Princy Parsana, Brunilda Balliu, Kevin S Smith, Zachary Zappala, David A Knowles, Marie-Julie Favé, Joe R Davis, Xin Li, Xiaowei Zhu, et al. Impact of the x chromosome and sex on regulatory variation. *Genome research*, 2016.

[9] James E Verdone, Princy Parsana, Robert W Veltri, and Kenneth J Pienta. Epithelial–mesenchymal transition in prostate cancer is associated with quantifiable changes in nuclear structure. *The Prostate*, 75(2):218–224, 2015.

[10] Steven M Mooney, Princy Parsana, James R Hernandez, Xin Liu, James E Verdone, Gonzalo Torga, Calvin A Harberg, and Kenneth J Pienta. The presence of androgen receptor elements regulates zeb1 expression in the absence of androgen receptor. *Journal of cellular biochemistry*, 116(1):115–123, 2015.

[11] Dongya Jia, Mohit Kumar Jolly, Marcelo Boareto, Princy Parsana, Steven M Mooney, Kenneth J Pienta, Herbert Levine, and Eshel Ben-Jacob. Ovol guides the epithelial-hybrid-mesenchymal transition. *Oncotarget*, 6(17):15436, 2015.

[12] John Wrangle, Wei Wang, Alexander Koch, Hariharan Easwaran, Helai P Mohammad, Frank Vendetti, Wim VanCriekinge, Tim DeMeyer, Zhengzong Du, Princy Parsana, et al. Alterations of immune response of non-small cell lung cancer with azacytidine. *Oncotarget*, 4(11):2067, 2013.

For a complete list of my publications please visit [Google Scholar](#)

Teaching Experience & Certifications

Spring 2016 — **Teaching Assistant**, *Computational Genomics-Data Analysis*, CS438/638, Dept. of Computer Science, Johns Hopkins University.
Instructor: Alexis Battle
- Upper level undergraduate and Graduate level class with over 40 students
- Responsible for grading, formulating assignments and solutions

Spring 2017/19 — **Guest Lectures**, *Computational Genomics-Data Analysis*, CS438/638, Dept. of Computer Science, Johns Hopkins University.
- Missing data, Expectation Maximization and Gaussian Mixture Models (2017)
- Network Learning (2017, 2019)

Fall 2017 — **Co-instructor**, *Data Science - Applications in healthcare and genomics*, Johns Hopkins University.
Co-instructed HEART course - a one credit class focused around the idea of introducing your domain of research to freshmen at Whiting School of Engineering at Johns Hopkins (with Anand Malpani)
- Held one session each week for a class of 19 students with majors in Computer Science, Chemical and Biomolecular Engineering and Applied Mathematics and Statistics
- Instructed on topics that included introductory statistics, linear algebra, and basic machine learning methods
- Employed interactive approaches to encourage student engagement. e.g. use of iClicker
- Designed and held in class lab sessions where students practiced programming exercises in R or python

Summer 2019 — **Attendee**, *Teaching Institute at Johns Hopkins*, JHU Teaching Academy.

Conference/Meetings

Oct 2019 — **Invited attendee**, Rising Stars Biomedical, 2019.

Aug 2019 — **Talk**, *Methods and data integration for reconstruction of gene co-expression networks*, Leena Peltonon School of Human Genomics.

Oct 2018 — **Platform Talk**, *Addressing confounding artifacts in reconstruction of gene co-expression networks*, American Society of Human Genetics.

April 2017 — **Grad Cohort Workshop**, *Selected Attendee*, Computing Research Association - Women.

Oct 2015 — **Poster - Reviewer's choice abstract**, *Global expression patterns and key regulators in Epithelial to Mesenchymal Transition*, American Society for Human Genetics.

April 2015 — **Grad Cohort Workshop**, *Selected Attendee*, Computing Research Association - Women.

Mentoring

Fall 2018 - Present	Prashanthi Ravichandran, PhD student Biomedical Engineering
Mar 2018 - June 2019	Amy He, Masters student Computer Science
Spring 2018	Mia Liliana Boloix, Undergraduate student Computer Science
Fall 2015, Spring 2016	Qing Li, Masters student Computer Science

Software

curatedCRCData, Bioconductor package

netPCA, R package

sva_network, function in R package

Professional Service and outreach

Junior Reviewer	○ RECOMB 2019 (Alexis Battle) ○ Machine Learning in Computational Biology (Alexis Battle) ○ Machine Learning in Systems Biology (Alexis Battle) ○ Nature Methods (Jeffrey T. Leek)
Reviewer	○ Women in Machine Learning Workshop (2019) ○ BBA Gene Regulatory Mechanisms
Johns Hopkins	**Student member** of the Johns Hopkins Diversity Leadership Council (2019-20)

Computer Science @ JHU	○ **Panelist**, Intersession (2019) - Navigating through grad school
	○ **Graduate Council Head** (2017 - 19)
	   - Led effort to form Graduate Student Council at CS. Helped bring several student concerns to the notice of department administration
	   - Envisioned and supported professional development activities for students including: a) student seminar series aimed at giving a platform for senior PhD students to practice job talks and get feedback from a broad audience, and b) informal student talks - an opportunity for PhD students to explain their science to a general 'non-science' audience; aimed at building science communication skills
	○ **Faculty Czar** (2015 - 2016)
	   - Attended CS faculty meetings and shared relevant notes with the PhD students in the department

GRACE **Professional Development Chair**, Graduate Women in Computer Science and ECE(2017-18)

IGSA @ JHU **President**, Indian Graduate Students' Association (2014)