

# Hirak Sarkar

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## Education

- Ph.D in Computer Science** 2020 (expected)  
Efficient Processing and Statistical Inference in RNA-seq data, *advisor: Prof. Rob Patro*  
University of Maryland, MD
- MS in Computer Science** 2014 - transferred  
Improving storage and alignment methodologies for RNA-seq data, *advisor: Prof. Rob Patro*  
Stony Brook University, NY  
GPA: 3.9/4.00
- Masters of Technology (Computer Science)** 2011-2013  
Indian Statistical Institute, Calcutta  
1<sup>st</sup> Class (Hons.)
- Bachelor of Technology (Computer Science and Engineering)** 2007-2011  
West Bengal University of Technology  
GPA: 8.88/10

## Publications (Bioinformatics)

1. *Terminus enables the discovery of data-driven, robust transcript groups from RNA-seq data.*, by Hirak Sarkar, Avi Srivastava, Hector Corrada Bravo, Michael I. Love and Rob Patro. [**ISMB'20**]
2. *A Bayesian framework for inter-cellular information sharing improves dscRNA-seq quantification*, by Avi Srivastava, Laraib Malik, Hirak Sarkar, Rob Patro. [**ISMB'20**]
3. *Alignment and mapping methodology influence transcript abundance estimation*, by Avi Srivastava, Laraib Malik, Hirak Sarkar, Mohsen Zakeri, Charlotte Sonesson, Michael I. Love, Carl Kingsford, Rob Patro. [Submitted **Genome Bio.**]
4. *Minnow: A principled framework for rapid simulation of dscRNA-seq data at the read level*, by Hirak Sarkar, Avi Srivastava and Rob Patro [**ISMB'19**].
5. *Towards Selective-Alignment: Producing Accurate And Sensitive Alignments Using Quasi-Mapping*, by Hirak Sarkar\*, Mohsen Zakeri\*, Laraib Malik and Rob Patro [**ACM BCB'18**].
6. *An Efficient, Scalable and Exact Representation of High-Dimensional Color Information Enabled via de Bruijn Graph Search*, by Fatemeh Almodaresi\*, Hirak Sarkar\*, Avi Srivastava and Rob Patro [**ISMB'18**].
7. *Quark enables semi-reference-based compression of RNA-seq data* by Hirak Sarkar and Rob Patro [accepted **Bioinformatics'17**].
8. *Fast, Lightweight Clustering of de novo Transcriptomes using Fragment Equivalence Classes* by A Srivastava\*, Hirak Sarkar\*, Laraib Malik and Rob Patro (\* Joint first authors) [**RECOMB-seq'16**].
9. *RapMap: A Rapid, Sensitive and Accurate Tool for Mapping RNA-seq Reads to Transcriptomes* by A Srivastava, Hirak Sarkar, Nitish Gupta and Rob Patro [**ISMB'16**].

## Non-Bioinformatics

1. *Social Media Attributions in the Context of Water Crisis* by Rupak Sarkar, [Hirak Sarkar](#), S Mahinder and AR KhudaBukhsh. [[ArXiv'20](#)]
2. *Voronoi Game on Graphs* (Extended version) by S. Bandyapadhyay, A. Banik, S. Das and [H. Sarkar](#) (in alphabetical order of surnames) *Journal of Theoretical Computer Science* [[Journal of Theoretical Computer Science'15](#)].

## Posters

1. *Pufferfish: A fast graph-based indexing and query strategy for large genomic sequences* by Fatemeh Almodaresi\*, [Hirak Sarkar\\*](#), and Rob Patro, Poster presented in [[WABI'17](#)].
2. *Joint probabilistic model for multiple steps of gene regulation* by [Hirak Sarkar](#), Yi-Fei Huang and Adam Siepel, Poster presented in *BioData'16*

## Professional Experience

- **Facebook Inc.** Worked as Ph.D data scientist intern. I worked on designing scalable pipelines to analyze the data from millions of users. Applied transfer learning based methods in order to measure the effect of natural calamity such as cyclone or wild fire from open source satellite images.
- **Simons Center for Quantitative Biology, Cold Spring Harbor Lab:** Worked under the supervision of Prof. Adam Seipel from May, 2016 to July, 2016. We designed probabilistic graphical model to infer transcription and degradation rates from different assays such as GRO-seq and RNA-seq.
- *Summer Assistantship '15, '17* with Prof. Rob Patro. We worked on various problems ranging from
- Teaching Assistant for CSE549 (Computational Biology), CSE219 (Game Programming)
- *Visiting Researcher* at Advanced Computing & Microelectronics Unit, Indian Statistical Institute from October, 2013 to December, 2013. I worked on Computational Geometry and Graph Theory
- *Junior Research Fellow* in Department of Computer Science & Engineering at Indian Institute of Technology, Kharagpur (IIT) from July, 2013 to Sept, 2013. I was a member of Complex Network Engineering Group. I did TA-ship for Introductory Programming Course in that brief stint.

## Awards and Honors

- Awarded *Research Assistantship*, SBU (2016-present)
- Awarded *Special CS Chair Fellowship (of \$10000)*, SBU (2014-2015)
- Awarded *NUS Research Scholarship*, NUS (Jan'14-June'14)
- Awarded *Post-graduate Scholarship* by, Govt. of India. (2011-2013)
- Received [First Prize](#) for Software Competition (IEM), Calcutta.

## Programming Skills

Python, C++, Rust

## References

- Prof. Robert Patro
- Prof. Michael I. Love
- Prof. Héctor Corrada Bravo