

Raunak Kumar

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Education

Cornell University

PHD IN COMPUTER SCIENCE

- Advisor: Austin R. Benson.

Ithaca, New York

2018 - Present

University of British Columbia

B.SC. (WITH DISTINCTION) IN COMPUTER SCIENCE

- Advisor: Mark Schmidt.
- A+ graduating average.

Vancouver, British Columbia

2013 - 2018

Awards

2019 **Cornell Computer Science Teaching Assistant Award**

2018 **Cornell University Fellowship** US \$30,400

2018 **NSERC Canada Graduate Scholarships-Master's** CA \$17,500 (declined)

2018 **Rick Sample Memorial Research Scholarship**

2018 **CRA Outstanding Undergraduate Researcher Award** Honorable Mention

2017 **UBC Computer Science Teaching Assistant Award**

2017 **NSERC Undergraduate Student Research Award** CA \$4,000

2013-2017 **UBC Science Scholar / Dean's Honors List**

2014 **J. Fred Muir Memorial Scholarship in Science** CA \$200

2014 **Trek Excellence Scholarship** CA \$1,500

2013 **UBC Chancellor's Scholar Award**

Experience

Department of Computer Science, Cornell

GRADUATE RESEARCH ASSISTANT

Working with Prof. Austin R. Benson on deep learning models for temporal graphs and hypergraphs. Gained experience working with graph neural networks and re-implemented them in PyTorch. Also worked on developing fast deterministic and randomized sampling algorithms for weighted subgraph retrieval in large graphs (paper under submission).

Ithaca, USA

February 2019 - Present

Department of Computer Science, UBC

UNDERGRADUATE RESEARCH ASSISTANT

Worked with Prof. Mark Schmidt on proving the first non-asymptotic global convergence rate of expectation-maximization (EM) and developed improved variants of the EM algorithm. Also collaborated on projects in computer vision and consulted for a local company on detecting dangerous gases based on sensor measurements as part of a smart air purification system.

Vancouver, Canada

May 2017 - May 2018

Google

SOFTWARE ENGINEERING INTERN

Worked on a distributed datastore trigger utility in C++. This utility provides an extensible way to maintain triggers, which are used to schedule and perform asynchronous actions. It was used by an internal team to remove 1 billion triggers from storage.

Mountain View, USA

May 2016 - August 2016

Publications

- [1] **Raunak Kumar***, Paul Liu*, Moses Charikar, and Austin R. Benson. "Retrieving Top Weighted Triangles in Graphs". In: *Proceedings of the 13th ACM International Conference on Web Search and Data Mining (WSDM)*. 2020.
- [2] Devon R. Graham* and **Raunak Kumar***. *Approximating Steiner Trees in the Semi-Streaming Model*. Tech. rep. CPSC 563N Course Project. University of British Columbia, 2017.
- [3] **Raunak Kumar**, and Mark Schmidt. "Convergence Rate of Expectation-Maximization". In: *10th Neural Information Processing Systems (NeurIPS) Workshop on Optimization for Machine Learning*. 2017.

Teaching

Department of Computer Science

Cornell University

TEACHING ASSISTANT

January 2019 - Present

Worked as a TA for Mathematical Foundations for The Information Age. My responsibilities included handling course administration, leading and coordinating the team of TAs, holding office hours and grading. I was awarded the Cornell Computer Science Teaching Assistant Award in recognition of my accomplishments and contributions as a teaching assistant for Mathematical Foundations for The Information Age taught by Prof. John Hopcroft.

Computer Science 490: Problem Solving Seminar

University of British Columbia

INSTRUCTOR

Jan 2017 - April 2017

As an undergrad, co-taught a full 3 credit student seminar focusing on practical applications of advanced algorithms and data structures. My responsibilities included lecturing, writing lecture notes and creating assignments. Website: www.ugrad.cs.ubc.ca/~cs490/2016W2/

Department of Computer Science

University of British Columbia

TEACHING ASSISTANT

September 2014 - April 2018

Worked as a TA for many courses, including Machine Learning (graduate and undergraduate), Advanced Algorithm Design and Analysis, Intermediate Algorithm Design and Analysis, Advanced Operating Systems, Introduction to Computer Systems, and Models of Computation. My responsibilities included lecturing, grading, and holding office hours and tutorials. I was awarded the UBC Computer Science Teaching Assistant Award in recognition of my accomplishments and contributions in this role.

Outreach and Service

OUTREACH

- 2019 **Girls' Adventures in Math** Volunteered for an outreach event for upper elementary and middle school girls. *Ithaca, USA*
- 2019 **Expand Your Horizons** Taught Scratch to girls in 7th - 9th grades to get them interested in STEM fields. *Ithaca, USA*

Honors

- 2015-2017 **Contestant** ACM-ICPC PacNW Regionals - placed 13th (2016) and 15th (2017) in Div. 1 and 6th in Div. 2 (2015)
- 2017 **Coach** ACM-ICPC PacNW Regionals (Div. 2) - placed 1st and 3rd (2017)
- 2016-2017 **Contestant** Microsoft College Code Competition - placed 6th (2016) and 2nd (2017)
- 2016-2017 **Contestant** NAIPC (Open Division USA/Canada) - placed 27th (2016) and 15th (2017)
- 2017 **Contestant** SFU Winter Programming Contest - placed 8th
- 2015 **Contestant** Calgary Collegiate Programming Competition (Div. 2) - placed 3rd

Skills

- Programming Languages** Python, C++, C, Julia, Matlab, Go
- Machine Learning Frameworks** PyTorch, scikit-learn, NumPy
- Languages** English, Hindi, Spanish, Bengali, Maithili

Extracurricular Activity

Department of Computer Science

Cornell University

SPECIAL REPRESENTATIVE FOR WASTE MANAGEMENT

May 2019 - Present

Working to develop a culture of reuse and composting in the department, and reduce the amount of landfill waste generated, especially single-use plastic from food events.