Alok Tripathy

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Education

Aug 2019 – present
University of California — Berkeley, *Berkeley, CA*.
Ph.D. in Computer Science
Advised by **Aydın Buluç** and **Katherine Yelick**

Aug 2015 – May 2019
Georgia Institute of Technology, *Atlanta, GA*.
B.S. in Computer Science.
Graduated with Highest Honors

Research Experience

Aug 2019 – present
Research Affiliate, *Computational Research Division*, Lawrence Berkeley National Laboratory.
- Research in high-performance and scientific computing.
- Currently focusing on scalable graph-representation learning.
- Working under Aydın Buluç and Katherine Yelick

Nov 2015 – May 2019
Research Assistant, *High Performance Computing Lab*, Georgia Institute of Technology.
- Researched streaming graph algorithms under Dr. Oded Green and Prof. David Bader.
- Designed parallel algorithms for k-core, Point-to-Point Shortest Path problem, and Betweenness Centrality problems.

Jun 2017 – Aug 2017
Research Intern, *École polytechnique fédérale de Lausanne (EPFL)*, Lausanne, Switzerland.
- Worked under Prof. Willy Zwanepoel and Jasmina Malicevic in the Operating Systems Laboratory of EPFL.
- Developed a memory layout for graphs that improved cache locality and NUMA-awareness.

Jun 2016 – Aug 2016
Research Intern, *Sandia National Laboratories*, Livermore, CA.
- Implemented distributed cache coherency protocol using *Go*.
- Automated function summary generation for symbolic execution using *Python, angr*.

Publications

2020 A. Tripathy, K. Yelick, A. Buluç **Reducing Communication in Graph Neural Network Training**. *ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (SC) 2020, (to appear), arXiv preprint arXiv:2005.03300*

2019 J. Fox, A. Tripathy, O. Green. **Improving Scheduling for Irregular Applications with Logarithmic Radix binning**. *IEEE High Performance Extreme Computing (HPEC) 2019*, Waltham, MA

2018 A. Tripathy, O. Green. **Scaling Betweenness Centrality in Dynamic Graphs**. *IEEE High Performance Extreme Computing (HPEC) 2018*, Waltham, MA

2018 A. Tripathy, F. Hohman, D. H. Chau, O. Green. **Scalable K-Core Decomposition for Static Graphs Using a Dynamic Graph Data Structure**. *IEEE International Conference on Big Data 2018*, Seattle, WA

2018 **[Innovation Award]** O. Green, J. Fox, A. Watkins. A. Tripathy, K. Gabert, E. Kim, Xiaojing A., K. Aatish, D. Bader. **Logarithmic Radix Binning and Vectorized Triangle Counting.** *IEEE High Performance Extreme Computing (HPEC) 2018, Waltham, MA*

2018 A. Tripathy, O. Green. **Accurately and Efficiently Estimating Dynamic Point-to-Point Shortest Path**. Senior Thesis.

Teaching Experience

Jan 2016 – present
Teaching Assistant, *Data Structures and Algorithms (CS 1332)*, Georgia Institute of Technology.
- Led weekly recitations, office hours, designed, proctored, and graded exams.
- Senior TA: handled recitation guides for TAs, exams/practice exams, plagiarism detection, and delegated tasks to 27 TAs.

Service

Aug 2019 – present
Faculty Liaison, *CS Graduate Student Association*, University of California — Berkeley.
- Coordinated and led graduate student-run interviews of CS faculty candidates.
- Compiled results of interviews to report to current CS faculty.

Aug 2019 – present
Staff Writer, *Berkeley Science Review*, University of California — Berkeley.
- Writes magazine articles on Berkeley research for the general public.
- Articles written: "Tracking your E-Missions: From carbon output data to agile urban planning." here

Jan 2014 – Jun 2015
Co-Founder, *High School CTF*, hsctf.com.
- Co-founded the first ever computer science capture-the-flag competition run by high school students and reached over $3,000$ participants.

Industry Experience

May 2019 – Aug 2019
Software Engineer Intern, *NVIDIA*, New York, NY.
- Designed and wrote multi-GPU hash table for the RAPIDS cuGraph team in *CUDA/C++*.

May 2018 – Aug 2018
Software Engineer Intern, *Facebook*, Menlo Park, CA.
- Designed and wrote cache to speed up internal tool used for ads integrity by orders of magnitude in *C++*.
- Wrote web app to automate and accelerate workflow for engineers on the team.

Feb 2015 **Software Engineer Intern**, *Bloomberg L.P.*, Princeton, NJ.
Jun 2015 • Designed features for determining table borders in PDF files using *Java, Weka*.

Invited Talks

Reducing Communication in Graph Neural Network Training.

2020 **ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (SC) 2020**, Virtual.

Scalable K-Core Decomposition for Static Graphs Using a Dynamic Graph Data Structure.

2019 **NVIDIA GPU Technology Conference (GTC)**, San Jose, CA.

2018 **IEEE International Conference on Big Data**, Seattle, WA.

Honors

2019 **NSF Graduate Research Fellowship**, *National Science Foundation*.
Three years of research funding. Award to $2,000$ graduate students out of $12,000$ applicants.

2018-2019 **PURA Travel Award**, *Georgia Institute of Technology*.
President's Undergraduate Research Award to travel to IEEE HPEC 2018, IEEE Big Data 2018, and NVIDIA GTC 2019.

2018 **Google Games 1st Place**, *Atlanta, GA*.
1st out of 27 teams in Atlanta area in algorithmic programming competition.

2015 **Computer Security Awareness Week (CSAW) Capture-the-Flag**, *New York University*.
13th Nationally in College Division for computer security competition.

Skills

Languages C/C++, CUDA, Java, Python, Hack, Bash, Verilog, Go
Tools OpenMP, Cilk/Cilk Plus, OpenMPI, LaTeX, Linux, Vim, Git, METIS, Infomap, perf, IDA Pro, angr, Weka