

## Caleb Belth

---

4945 Bob and Betty Beyster Building  
Ann Arbor, MI  
Email: [cbelth@umich.edu](mailto:cbelth@umich.edu)

Phone: 260-494-7633  
Website: <https://quickshift.xyz>  
Twitter: <https://twitter.com/cbelth>

---

### Education

---

PhD, Computer Science, University of Michigan, Ann Arbor, MI Advisor: Danai Koutra	2018-Present
M.S., Computer Science, University of Michigan, Ann Arbor, MI Advisor: Danai Koutra 4.0 GPA	2018-2019
B.S., Computer Science, Purdue University, West Lafayette, IN Minors: Philosophy, Mathematics Research Advisors: Jennifer Neville, Dan Goldwasser, Daisuke Kihara 3.84 GPA	2014-2018

### Research Interests

---

Graph Mining, Graph Summarization, Streaming Algorithms, Information Theory, Linguistics.

### Awards and Honors

---

Rackham Graduate School Travel Award, University of Michigan	2019
ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD) Travel Award	2019
Dean's List (Purdue)	Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017
Semester Honors (Purdue)	Spring 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017

### Publications

---

#### Conference

3. **Caleb Belth**, Xinyi Zheng, Jilles Vreeken, Danai Koutra. *What is Normal, What is Strange, and What is Missing in a Knowledge Graph: Unified Characterization via Inductive Summarization*. ACM The Web Conference (WWW), April 2020.
2. Tara Safavi, **Caleb Belth**, Lukas Faber, Davide Mottin, Emmanuel Muller, Danai Koutra. *Personalized Knowledge Graph Summarization: From the Cloud to Your Pocket*. IEEE International Conference on Data Mining (ICDM), November 2019.
1. **Caleb Belth**, Fahad Kamran, Donna Tjandra, and Danai Koutra. *When to remember where you came from: Node representation learning in higher-order networks*. IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), August 2019.

## Workshop

1. **Caleb Belth**, Fahad Kamran, Donna Tjandra, and Danai Koutra. *When to remember where you came from: Node representation learning in higher-order networks*. ACM SIGKDD Workshop on Mining and Learning with Graphs (MLG), August 2019.

## Outreach

---

<i>Designing a Seamless Integrated Mobility System</i> , World Economic Forum Graduate student lead, project to make access to transportation more equitable	2019-present
CSEG Wellness, University of Michigan Co-founder, organization to improve graduate student wellness	2019-present
Explore Graduate Studies, University of Michigan Volunteer, one-day workshop that aims to prepare undergraduates for the graduate school application process and broaden participation in computer science	October 2019
MIDAS Data Science Summer Camp for High School Students, University of Michigan Instructor, week-long summer camp	July 2019

## Student Mentoring

---

Xinyi Zheng, Senior, University of Michigan Now applying to top tier PhD programs	2019-present
Mark Jin, Senior, University of Michigan Now applying to top tier MS programs	2018

## Invited Talks

---

<i>ThinkBIG: Your Roadmap to Landing a Role at a Startup</i> , Purdue University	September 2017
--	----------------

## Poster Presentations

---

<i>MIDAS Symposium Poster Session</i> , University of Michigan <i>What is Normal, What is Strange, and What is Missing in a Knowledge Graph: Unified Characterization via Inductive Summarization</i>	November 2019
<i>Michigan AI Symposium Poster Session</i> , University of Michigan <i>When to remember where you came from: Node representation learning in higher-order networks</i>	October 2019
<i>Purdue Undergraduate Research &amp; Poster Symposium</i> <i>Deep Learning for Protein Binding Ligand Prediction</i>	April 2017

## Reviewing

---

ACM The Web Conference (WWW) Subreviewer	2020
ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD) Subreviewer	2019

IEEE International Conference on Data Science and Advanced Analysis (DSAA)  
Subreviewer

2019

## Industry Experience

---

*Software Engineer Intern*, Sift, San Francisco, CA May-Aug 2018  
Developed and deployed a gradient tree-boosting algorithm for automated fraud detection

*Software Engineer Intern*, Handshake, San Francisco, CA May 2017-Aug 2017  
Developed the university-facing side of a web platform for university students to find their ideal employers

*Software Engineer Intern*, Iris, Owosso, MI May-Aug 2016  
Developed Android code to run computer vision inference on mobile

*Software Engineer Intern*, Covenant Eyes, Owosso, MI Jun-Aug 2015  
Developed Android code

*Software Development Intern*, Enspire Software, Fort Wayne, IN May-Aug 2014  
Developed Android code

## Programming Languages in order of proficiency

---

Python, Java, C, C++, Bash Scripting, Ruby, Scala

## Professional Membership

---

Association of Computing Machinery (ACM) Student Member, 2019-Present

## Other Projects

---

Machine Learning Text and Network Joint Embeddings, Purdue University 2017-2018  
Researched jointly embedding text and social network nodes into the same embedding space

Deep Learning for Protein Binding Ligand Prediction, Purdue University 2015-2018  
Researched using deep learning to predict protein binding ligands for drug design