Frank Austin Nothaft

fnothaft@alumni.stanford.edu • http://www.fnothaft.net • 202.340.0466

Education

University of California, Berkeley
Doctor of Philosophy, Computer Science. August 2013–present. GPA: 3.81.
Advanced to candidacy, May 2016. Advisors: Dave Patterson and Anthony Joseph.
Masters of Science, Computer Science. August 2013–May 2015. GPA: 3.79.

Stanford University
Bachelor of Science with Honors, Electrical Engineering. September 2007–June 2011.
Minor in Management Science & Engineering. GPA: 3.24.

Honors

NSF Graduate Research Fellowship
National Science Foundation, August 2013–May 2016

Hugh Hildreth Skilling Award for Teaching Excellence
Stanford University Department of Electrical Engineering, June 2011

Departmental Honors
Stanford University Department of Electrical Engineering, June 2011

Publications

Peer-Reviewed Journal Articles

1. John Vivian, Arjun Rao, **Frank Austin Nothaft**, Christopher Ketchum, Joel Armstrong, Adam Novak, Jacob Pfeil, Jake Narkizian, Alden D. Deran, Audrey Musselman-Brown, Hannes Schmidt, Peter Amstutz, Brian Craft, Mary Goldman, Kate Rosenbloom, Melissa Cline, Brian O'Connor, Megan Hanna, Chet Birger, W. James Kent, David A. Patterson, Anthony D. Joseph, Jingchun Zhu, Sasha Zaranek, Gad Getz, David Haussler, and Benedict Paten. "Toil enables reproducible, open source, big biomedical data analyses." In *Nature Biotechnology*, April 2017. Originally posted as *BioRχiv:062497*, July 7, 2016.

2. Zhao Zhang, Kyle Barbary, **Frank Austin Nothaft**, Evan Sparks, Oliver Zahn, Michael J. Franklin, David A. Patterson, and Saul Perlmutter. "Kira: Processing Astronomy Imagery Using Big Data Technology." In *IEEE Transactions on Big Data*, (IEEE TBD), August 2016. Extended version of Zhang BigData '15.

3. Benedict Paten, Mark Diekhans, Brian J. Druker, Stephen Friend, Justin Guinney, Nadine Gassner, Mitchell Guttman, W. James Kent, Patrick Mantey, Adam A. Margolin, Matt Massie, Adam M. Novak, **Frank Austin Nothaft**, Lior Pachter, David Patterson, Maciej Smuga-Otto, Joshua M. Stuart, Laura Van't Veer, Barbara Wold, and David Haussler. "The NIH BD2K Center for Big Data in Translational Genomics." In *Journal of the American Medical Informatics Association (JAMIA),* July 2015. Invited.

Peer-Reviewed Conference Proceedings

4. Zhao Zhang, Kyle Barbary, **Frank Austin Nothaft**, Evan Sparks, Oliver Zahn, Michael J. Franklin, David A. Patterson, and Saul Perlmutter. "Scientific computing meets big data technology: An astronomy use case." In *Proceedings of the International Conference on Big Data*, November 2015 (BigData '15). Originally posted as *ArXiv:1507.03325.*

Publications (con't)

Peer-Reviewed Conference Proceedings (con't)

5. **Frank Austin Nothaft**, Matt Massie, Timothy Danford, Zhao Zhang, Uri Laserson, Carl Yeksigian, Jey Kottalam, Arun Ahuja, Jeff Hammerbacher, Michael Linderman, Michael J. Franklin, Anthony D Joseph, and David A. Patterson. "Rethinking data-intensive science using scalable analytics systems." In *Proceedings of the International Conference on Management of Data*, May 2015 (SIGMOD '15).

6. **Frank Austin Nothaft**, Luis Fernandez, Stephen Cefali, Nishant Shah, Luke Darnell, and Jacob Rael. "Pragma-based floating-to-fixed point conversion for the emulation of analog behavioral models." In *Proceedings of the International Conference on Computer-Aided Design*, November 2014 (ICCAD '14).

7. Krishna Malladi, **Frank Austin Nothaft**, Kartika Periythambi, Benjamin Lee, Christos Kozyrakis, and Mark Horowitz. "Towards energy-proportional datacenter memory with mobile DRAM." In *Proceedings of the International Symposium on Computer Architecture*, June 2012 (ISCA '12).

Technical Reports

8. Matthew Massie, **Frank Austin Nothaft**, Christopher Hartl, Christos Kozanitis, André Schumacher, Anthony D. Joseph, and David A. Patterson. "ADAM: Genomics formats and processing patterns for cloud scale computing." *University of California, Berkeley Technical Report UCB/EECS-2013-207.* November 2013.

Theses

9. **Frank Austin Nothaft**, "Scalable Systems and Algorithms for Genomic Variant Analysis." Doctoral Thesis, December 2017. *University of California, Berkeley Technical Report UCB/EECS-2017-204.*

10. **Frank Austin Nothaft**, "Scalable genome resequencing with `ADAM` and `avocado`." Masters Thesis, May 2015. *University of California, Berkeley Technical Report UCB/EECS-2015-65.*

11. **Frank Austin Nothaft**, "Design strategies for compiler managed instruction stores." Honors Thesis, Stanford University, June 2011.

Preprints

12. Alyssa Kramer Morrow, George Zhixuan He, **Frank Austin Nothaft**, Justin Paschall, Nir Yosef, Anthony D. Joseph. "Mango: Distributed Visualization for Genomic Analysis." *BioRχiv:360842*, July 2018.

Presentations

Conference Talks

"Processing 70TB of Genomic Data with ADAM and Toil"
Spark Summit, Boston, MA, February 2017
Biological Data Science (BIODATA '16), Cold Spring Harbor, NY, October 2016
Genome Informatics (GI '16), Hinxton, UK, September 2016
Bioinformatics Open Source Conference (BOSC '16), Orlando, FL, July 2016
Spark Summit, San Francisco, CA, June 2016

Presentations (con't)

Conference Talks (con't)

"Rethinking data-intensive science using scalable analytics systems."
International Conference on Management of Data (SIGMOD '15), Melbourne, Australia, June 2015

"Reproducible Emulation of Analog Behavioral Models."
International Conference on Computer Aided Design (ICCAD '14), San Jose, CA, November 2014

"ADAM: Fast, Scalable Genome Analysis"
Bioinformatics Open Source Conference (BOSC '14), Boston, MA, July 2014
Spark Summit, San Francisco, CA, June 2014

Invited Talks

"Processing 70TB of Genomic Data with ADAM and Toil"
CROSS Research Symposium, Santa Cruz, CA, October 2016
VA Palo Alto, Palo Alto, CA, October 2016

"ADAM: Fast, Scalable Genome Analysis"
Color Genomics, Millbrae, CA, July 2016
Johnson and Johnson, Belgium, December 2015
Human Longevity, Mountain View, CA, June 2015
DNANexus, Mountain View, CA, December 2014
Novartis Institutes, Cambridge, MA, October 2014
Wellcome Trust Genome Center, Hinxton, UK, July 2014

"Fast Variant Calling with ADAM and avocado"
KTH Kista/SICS, Kista, Sweden, February 2015

"Automation For Validating Behavioral Models Against Schematics"
With Nishant Shah, *Cadence Mixed Signal Design Summit*, San Jose, CA, September 2012

Work Experience

Databricks, Go-To-Market Lead, Genomics **January 2018–present**
Databricks, Genomics SME (Consultant) **February 2017–December 2017**
Design and deployment of Apache Spark-based genomics workflows

Broadcom, R&D Engineer, IC Design 2 **March 2016–June 2016**
Broadcom, Engineer, Staff 1—IC Design **April 2012–March 2016**
Broadcom, Engineer—IC Design **June 2011–April 2012**
Design verification and automation for RF/mixed-signal integrated circuits

Internships

NVIDIA, ASIC Intern **Summer 2010**
Design validation, test, and characterization for GPU systems

SAIC, Systems Engineering Intern **Summer/Winter 2008**
Evaluation of technologies for high-reliability emergency telecommunications

AJ Engineers, Inc., Electrical Engineering Intern **Summer 2007**
Design and drafting of electrical systems for dwellings

Teaching

CS162: Operating Systems **Summer 2015, Spring 2016**
Course Assistant for Dr. Charles Reiss, and Professor Anthony D. Joseph, University of California, Berkeley

EE109: Digital Systems Design Lab **Spring 2011**
Course Assistant for Dr. James Weaver, Stanford University

EE108A: Digital Systems Design 1 **Fall 2009, 2010, Winter 2010, 2011**
Course Assistant for Professor Subhasish Mitra, Stanford University

Service

Standards Bodies
Co-chair, GA4GH Containers and Workflows Working Group, 2015
Member, GA4GH Data Working Group, 2014–present

Conference Organization
New Frontiers in Computing (NFIC)
Co-Chair, Stanford, CA, 2010
Organizing Committee Member, Stanford, CA, 2009

Reviewing
Bioinformatics Open Source Conference (BOSC), 2015–2016
Hot Topics in Networks Workshop (HotNets), 2014

Professional Society Leadership
Chair, IEEE Orange County Computer Society, 2013
Vice Chair, IEEE Orange County Computer Society, 2012
Chair, Stanford University IEEE Student Branch, June 2009–June 2011

Outreach
Project Mentor
Techbridge, Oakland, CA, 2014

Panel on Careers in Science, Technology, Engineering, and Mathematics
The Wooden Floor, Santa Ana, CA, May 2012

Professional Society Membership
IEEE: Graduate Student Member: 2014–present, Member: 2011–2013, Student Member: 2007–2011
ACM: Member: 2011–present, Student Member: 2011
ISCB: Student Member: 2014–present

Students Mentored
Eric Tu, UC Berkeley, Undergraduate/Masters
Niranjan Kumar, UC Berkeley, Undergraduate
Ananth Pallaseni, UC Berkeley, Undergraduate