Jeremy Kun

Curriculum Vitae

✉ *jeremy /at/ 21.co*

Personal

Name	Jeremy Kun
Research summary	I am a theoretical computer scientist with broad interests, including complexity theory, graph theory and network science, learning theory, combinatorics, and geometry. My research to date focuses on theoretical and applied graph theory. I currently work as a backend engineer at 21 Inc.
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Webpage	**https://jeremykun.com**

Education

2011 - 2016 **University of Illinois at Chicago**, Ph.D in Mathematics., Expected 2016.

2007 - 2011 **California Polytechnic State University**, B.S. in Mathematics, Minor in Computer Science., Magna Cum Laude.

2010 **Budapest Semesters in Mathematics**, Graduated with honors.

Publications

2016 **Graphs, New Models, and Complexity**, *Jeremy Kun*, The University of Illinois at Chicago.

2016 **A Confidence-Based Approach for Balancing Fairness and Accuracy**, *Benjamin Fish, Jeremy Kun, Adam Lelkes*, SIAM International Symposium on Data Mining.

2016 **Interception in Distance-Vector Routing Networks**, *David Burstein, Franklin Kenter, Jeremy Kun, Feng Shi*, Journal of Complex Networks.

2015 **On the Computational Complexity of MapReduce**, *Benjamin Fish, Jeremy Kun, Adam Lelkes, Lev Reyzin, Gyorgy Turan*, International Symposium on Distributed Computing.

2015 **Network Installation Under Convex Costs**, *Alexander Gutfraind, Jeremy Kun, Adam Lelkes, Lev Reyzin*, Journal of Complex Networks.

2015 **Fair Boosting: a Case Study**, *Benjamin Fish, Jeremy Kun, Adam Lelkes*, International Conference on Machine Learning Workshop on Fairness, Accountability, and Transparency in Machine Learning.

2015 **Open Problem: Learning Quantum Circuits with Queries**, *Jeremy Kun, Lev Reyzin*, Conference on Learning Theory.

2014 **A Boosting Approach to Learning Graph Representations**, *Rajmonda Caceres, Kevin Carter, Jeremy Kun*, SIAM International Conference on Data Mining Workshop on Mining Networks and Graphs.

2014 **On Coloring Resilient Graphs**, *Jeremy Kun, Lev Reyzin*, Mathematical Foundations of Computer Science.

2013 **Anti-Coordination Games and Stable Graph Colorings**, *Jeremy Kun, Brian Powers, Lev Reyzin*, Syposium on Algorithmic Game Theory.

Preprints

Locally Boosted Graph Aggregation for Community Detection, Rajmonda Caceres, Kevin Carter, Jeremy Kun.
In review

Awards

2014 **Dean's Scholar Award**, *To provide the most distinguished, advanced-level graduate students with a period of time dedicated solely to the completion of their programs*, Granted by University of Illinois at Chicago.
Monetary value of $25,000

2015 **Best Student Poster Award**, *For the poster 'Information Monitoring in Routing Networks'*, Granted by SIAM Network Science 15.
Monetary value of $100

2011 **Charles J. Hanks Excellence in Mathematics Award**, *Demonstrated excellence and outstanding ability*, Granted by California Polytechnic State University.

2010 **Robert P. Balles Mathematics Award**, *Highest GPA in mathematics coursework after three years*, Granted by California Polytechnic State University.

2007 **Eagle Scout Award**, *Troop 234 of Moraga, CA*, Granted by Boy Scouts of America.

Work Experience

2016 - present **Backend Engineer**, *21 Inc.*
Built the Django backend for a task marketplace, including surveys, branching task pipelines, and automated reviews. Additional roles building an elasticsearch integration, doing ad hoc data science, maintaining an open-source bitcoin wallet (two1-python), and a mobile developer

2013 - 2014 **Graduate Research Assistant**, *MIT Lincoln Laboratory*.
Research on graph representation learning, data mining on large networks. Proved theorems, designed algorithms, ran experiments, and wrote technical research papers

2011 - 2013 **Graduate Teaching Assistant**, *University of Illinois at Chicago*.
Taught calculus and introductory computer science

2008 - 2009 **Junior Developer**, *CreateSpace On-Demand Publishing*.
Designed and developed a new accounting gateway infrastructure for a growing tech start-up, including writing thousands of lines of Java and SQL. Completed a technical writing training program

Contract Work

2014 - 2015 **Technical Reviewer**, *Doing Math with Python*, No Starch Press.
Publication date: 2015-05-25

2012 - Present **Webmaster**, ***QED Math Symposium***, Chicago Public Schools.

Professional Programs

June 2014 **Network Science Week**, *American Mathematical Society Mathematics Research Community*.
Received mentoring, engaged in research to attack open problems, and developed new collaborations

Summer 2013 **Ph.D Student Intern**, *MIT Lincoln Labs*.
Research on machine learning in large graphs

Summer 2012 **Ph.D Student Intern**, *Lawrence Livermore National Laboratory*.
Data mining research in wind energy and plasma physics

Summer 2009 **Software Developer Intern**, *Amazon.com*.
Worked on the message-passing framework in a million-line service-oriented C++ architecture which regulated inventory in all of Amazon's warehouses

Programming

Portfolio **Github Repository**.

Top Language **Python**.

Competent Languages **Python, Java, C, C++, Haskell, Racket, HTML/CSS, Mathematica, Javascript/Node/ES6**.

Familiar Languages **R, Perl, Bash, PHP, SQL**.

Service

2015 **Reviewer**, *ALT 2015*, Algorithmic Learning Theory.

2014 **Publicity Co-Chair**, *ISAIM 2014*, International Symposium on Artificial Intelligence and Mathematics.

2015 **Organizer**, *Graduate Student Colloquium*, University of Illinois at Chicago.

2013 - Present **Organizer**, *Graduate Student Theoretical Computer Science Seminar*, University of Illinois at Chicago.

2013 **Instructor**, *Website Workshop*, Association for Women in Mathematics, University of Illinois at Chicago.

Talks

2015 **Resilience and new approaches to approximate graph coloring**, *Theory Seminar, North Carolina State University*, Research talk.

2015 **What Can Algorithms Tell Us About Life, Love, and Happiness?**, *Moraine Valley Community College STEM Talks*, General audience talk.

2014 **On Resiliently Colorable Graphs**, *Computer Science Seminar, University of Illinois at Chicago*, Research talk.

2014 **Resilient Coloring and Other Combinatorial Problems**, *Midwest Theory Day. Purdue University*, Research talk.

2013 **Anti-Coordination Games and Stable Graph Colorings**, *Computer Science Seminar, University of Illinois at Chicago*, Research talk.

2015 **A Gentle Introduction to Learning Theory**, *Graduate Student Colloquium, University of Illinois at Chicago*, Graduate student talk.

2015 **Information Monitoring in Routing Networks**, *Chicago Area SIAM Student Conference, Illinois Institute of Technology*, Graduate student talk.

2014 **How to Combine Graphs**, *Chicago Area SIAM Student Conference, Northwestern University*, Graduate student talk.

2013 **Stable Graph Colorings, and Why You Should Care about NP**, *Graduate Student Colloquium, University of Illinois at Chicago*, Graduate student talk.

2013 **A Brief Overview of Persistent Homology and its Applications**, *Chicago Area SIAM Student Conference, University of Illinois at Chicago*, Graduate student talk.

2015 **Eigenfaces: using linear algebra to recognize faces**, *Undergraduate Math Club, Wheaton College*, Undergraduate student talk.

2015 **How to Send Secret Messages (RSA)**, *'Math and Snacks,' University of Illinois at Chicago*, Undergraduate student talk.

2014 **Hybrid Images and Fourier Analysis**, *Undergraduate Math Club, University of Illinois at Chicago*, Undergraduate student talk.

2014 **Elliptic Curves, Projective Geometry, and Python**, *Stanford Pre-Collegiate Studies*, High school talk.

2013 **Classic Nintendo Games are NP-Hard**, *Undergraduate Math Club, University of Illinois at Chicago*, Undergraduate student talk.

2012 **PageRank and the Billion-Dollar Eigenvector**, *Undergraduate Math Club, University of Illinois at Chicago*, Undergraduate student talk.

2011 **Eigenfaces: Linear Algebra for Facial Recognition**, *Undergraduate Math Club, University of Illinois at Chicago*, Undergraduate student talk.

2011 - Present **Guest lectures to high school students**, *Various locations*, High school talk.

Posters

2015 **Information Monitoring in Routing Networks**, SIAM Workshop on Network Science.

Teaching

Calculus 1 **TA**, *University of Illinois at Chicago*, Fall 2011, Fall 2013, Fall 2015.
Led a discussion session twice weekly

Differential Equations **TA**, *University of Illinois at Chicago*, Spring 2016.
Led a discussion session once weekly

Introduction to Mathematical Computer Science **TA**, *University of Illinois at Chicago*, Spring 2012, Fall 2012, Spring 2013.
Wrote a grading robot for all labs and projects

Other

Blog **Math Intersect Programming**, In-depth presentation of technical topics with full implementations in code. As of February 2017: 236 published posts, 2000 word average post length, over 3.5 million page views since June 2011.