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Alex Cameron

Curriculum Vitae

My research interests are in graph theory and combinatorics. In particular, I work on extremal problems as well as Ramsey theory questions for graphs, hypergraphs, and other combinatorial structures.

Education

2018 **PhD - Mathematics**, *University of Illinois at Chicago*, Chicago, IL.
Advisors: György Turán and Dhruv Mubayi.
Thesis: "Extremal Problems on Directed Hypergraphs and the Erdős-Gyárfás Ramsey Problem Variant for Graphs"

2011 **JD**, *Duke University School of Law*, Durham, NC.

2006 **BA in Mathematics and Physics**, *Hendrix College*, Conway, AR.
Advisor: Byungchul Cha.
Graduated with distinction in both majors.
Earned math department award for best original research.
Attended *Budapest Semesters in Mathematics* in the Fall of 2004.

Published and Accepted Papers

2018 **A $(5,5)$-colouring of K_n with few colours**, *Combinatorics, Probability and Computing*, Cambridge University Press, coauthored with Emily Heath.

2018 **Extremal numbers for directed hypergraphs with two edges**, *The Electronic Journal of Combinatorics*, 25(1), P1.56.

2010 **Counting ring homomorphisms**, *PME Journal*, Vol. 13, pages 65-67.
First place 2010 Richard Andree award for best papers to appear in the Pi Mu Epsilon Journal.

Submitted Papers

2017 **An explicit edge-coloring of K_n with six colors on every K_5**, Preprint at arXiv:1704.01156.

Invited Talks

January, 2018 **A $(5,5)$-coloring of K_n with few colors**, *AMS Special Session on Research from GRWC*, Joint Mathematics Meetings, San Diego, CA.

November, 2016 **Extremal problems on directed hypergraphs**, *Combinatorics Seminar*, Rényi Institute, Budapest, Hungary.

November, 2016 **Extremal problems on directed hypergraphs**, *Combinatorics Seminar*, University of Szeged, Szeged, Hungary.

Contributed Talks and Presentations

May, 2017 **A $(5,5)$-coloring of K_n with few colors**, *29th Cumberland Conference on Combinatorics, Graph Theory and Computing*, Vanderbilt University, Nashville, TN.

August, 2016 **Extremal problems on generalized directed hypergraphs**, *EXCILL III: Extremal Combinatorics at Illinois*, IIT, Chicago, IL.
Poster presentation.

July, 2016 **(p,q)-colorings**, *Graduate Research Workshop in Combinatorics*, University of Wyoming, Laramie, WY.
Presented an open problem for participants of the workshop to consider.

April, 2016 **Extremal problems on directed hypergraphs: Forbidden subgraphs with two edges**, *Graduate Students Combinatorics Conference*, Clemson University, Clemson, SC.

April, 2006 **Counting ring homomorphisms**, *2006 Oklahoma-Arkansas MAA meeting*, University of Arkansas, Fayetteville, AR.
Awarded student presentation prize.

Department Talks

April, 2018 **Extremal problems on directed hypergraphs and the Erdős-Gyárfás Ramsey problem variant for graphs**, *Thesis Defense*, UIC, Chicago, IL.

March, 2017 **A variation of the Ramsey problem: (p,q)-colorings**, *Combinatorics Seminar*, UIC, Chicago, IL.

September, 2016 **Extremal living: Why you should go into combinatorics research**, *UIC Undergraduate Math Club*, UIC, Chicago, IL.

July, 2015 **Ehrenfeucht-Fraïssé games**, *Combinatorics Student Seminar*, UIC, Chicago, IL.

April, 2015 **Flag algebras**, *Combinatorics Student Seminar*, UIC, Chicago, IL.
A series of 3 talks explaining the flag algebra method.

Other Conferences and Workshops Attended

March, 2016 **Third Lake Michigan Workshop on Graph Theory and Combinatorics**, *Purdue University*, West Lafayette, IN.

March, 2014 **First Lake Michigan Workshop on Graph Theory and Combinatorics**, *Western Michigan University*, Kalamazoo, MI.

Teaching Experience

2018–Present **Assistant Professor (NTT)**, *Vanderbilt University*, Nashville, TN.
- Courses taught: Math 3700 *Discrete Mathematics*.

2017–2018 **Lecturer**, *University of Illinois at Chicago*, Chicago, IL.
- Courses taught: Math 125 *Elementary Linear Algebra*, Math 210 *Calculus III*, Math 215 *Introduction to Advanced Math*, and MCS 421 *Combinatorics*.
- Advisor for Neelima Borade's independent study of advanced calculus for the Honor's College.

2011–2017 **Teaching Assistant**, *University of Illinois at Chicago*, Chicago, IL.
- Courses taught as sole instructor: Math 075 *Beginning Algebra*, Math 090 *Intermediate Algebra*, and Math 300 *Writing for Mathematics*.
- Courses taught as TA: Math 090 *Intermediate Algebra*, Math 121 *Precalculus*, Math 125 *Elementary Linear Algebra*, Math 170 *Calculus for Life Science*, Math 180 *Calculus I*, Math 181 *Calculus II*, Math 220 *Differential Equations*, and MCS 260 *Introduction to Computer Science*.
- Courses graded: MCS 401 *Algorithms I* and CS 503 *Applied Graph Theory*.
- Served as advisor for Fazila Vhora on her Honors College senior capstone project, *Markov Chains*.
- Served as the graduate mentor for an undergraduate research project, *Brownian Motion on Manifolds*, as part of the Mathematical Computing Lab at UIC.
- Served as a judge for the math poster presentations at the Chicago Area Undergraduate Research Symposium in 2013 at IIT.
- Completed the non-required course GC 593 *Foundations of College Teaching* through the UIC Graduate College in Fall 2014.

2005–2006 **Math Tutor**, *Hendrix College Mathematics Department*, Conway, AR.

2003–2006 **Lab Teaching Assistant**, *Hendrix College Physics Department*, Conway, AR.
Courses: PHYS 230 *General Physics I*, PHYS 240 *General Physics II*, and PHYS 315 *Modern Physics*.

Other Experience

2009–2009 **Summer Legal Associate**, *Kim & Chang*, Seoul, South Korea.

2007–2007 **Finance Director**, *Reynolds for Senate*, Martinsville, VA.

2006–2006 **Production Assistant**, *Michigan Senate Democratic Fund*, Lansing, MI.

2004–2006 **Research Assistant**, *Dr. Robert Dunn*, Hendrix College Physics Department, Conway, AR.

Computer Skills

I have had various experiences working with Python, Sage, Final Cut Pro, LabVIEW, HTML, CSS, and TeX.

Personal Information

I enjoy playing with cats and dogs, performing improv theater, reading novels, amateur filmmaking, playing strategy board games like Diplomacy, and watching/analyzing the television shows Survivor and Big Brother.