

# Alan Guo

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## CONTACT INFORMATION

Computer Science and Artificial Intelligence Laboratory  
Massachusetts Institute of Technology  
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## EDUCATION

**Massachusetts Institute of Technology**, Cambridge, MA

Candidate for Ph.D. in Computer Science

- GPA: 5.0/5.0
- Advisor: Prof. Madhu Sudan

**Duke University**, Durham, NC

B.S. in Mathematics, minor in Computer Science, May 2011.

- *Summa cum laude* (GPA: 3.97/4.0)
- Highest Distinction in Mathematics
- Thesis Advisor: Prof. Ezra Miller
- Thesis: *Lattice point methods for combinatorial games.*

## ACADEMIC EXPERIENCE

**Massachusetts Institute of Technology**, Cambridge, MA

*Research Assistant*

*September 2011 to present*

- Research in theoretical computer science.

**Duke University**, Durham, NC

*Grader*

*August 2008 to May 2011*

- Courses: Linear algebra, real analysis, abstract algebra, combinatorics, measure theory.

*PRUV Researcher*

*June 2009 to July 2009*

- Worked on problems in combinatorial commutative algebra and combinatorial game theory.
- Proved algebraic structure for certain classes of games and constructed algorithms for them.

*Teaching Assistant*

*January 2009 to December 2009*

- Course: Intermediate Microeconomics.
- Held office hours and led recitation sections.

*Help Room Tutor*

*January 2009 to December 2009*

- Courses: Single variable calculus, multivariable calculus.

**University of Minnesota - Twin Cities**, Minneapolis, MN

*Research Experience for Undergraduates*

*June 2010 to July 2010*

- Proved a conjecture about the cyclic sieving phenomenon in non-crossing connected graphs.
- Worked with other undergraduates on connections between algebraic objects and combinatorial objects.

**DemiDec Resources**, Los Angeles, CA

*Mathematics Writer and Editor*

*June 2007 to August 2008*

- Wrote practice math exams for high school students to prepare for the United States Academic Decathlon.
- Exams included over 1,000 mathematics problems covering discrete math, geometry, algebra, trigonometry, and calculus.
- Edited exams and revised workbooks written by colleagues.

**LEADERSHIP****Duke University Math Union***President**August 2010 to May 2011*

- Leader of Duke's undergraduate math society
- Coordinated large, annual high school math competition, guest lectures, group social events, and participation in national and international competitions for undergraduates.

**HONORS AND AWARDS****National Science Foundation**

- NSF Graduate Research Fellowship, 2011.

**Duke University**

- Julia Dale Prize in Mathematics (awarded to top two senior math majors), 2011.
- Faculty Scholar (awarded to top three seniors), 2011.
- Assistant Chief Student Marshal (awarded to two juniors), 2010.
- Phi Beta Kappa, 2010.
- Karl Menger Award (awarded for excellence in math competitions), 2010, 2011.

**COMAP**

- Finalist Team (top 1%), Mathematical Contest in Modeling, 2010, 2011.

**Barry M. Goldwater Scholarship Program**

- Goldwater Scholarship Honorable Mention, 2010.

**PUBLICATIONS****Winning strategies for aperiodic subtraction games***Theoretical Computer Science* **421** (2012), 70–73.**Algorithms for lattice games**

(with Ezra Miller)

To appear in *International Journal of Game Theory*.**Trivariate monomial complete intersections and plane partitions**

(with Charles Chen, Xin Jin, and Gaku Liu)

*Journal of Commutative Algebra* **3** (2011), 459–489.**Cyclic sieving phenomenon in non-crossing connected graphs***Electronic Journal of Combinatorics* **18** (2011), #P9.**Lattice point methods for combinatorial games**

(with Ezra Miller)

*Advances in Applied Mathematics* **46** (2011), 363–378.**Potential applications of commutative algebra to combinatorial game theory**

(with Ezra Miller and Michael Weimerskirch)

*Kommutative Algebra*, abstracts from the workshop held April 19–25, 2009, edited by Winfried Bruns, Hubert Flenner, and Craig Huneke, Oberwolfach Reports (2009), no. 22, pp. 23–26.**SKILLS****Languages:** Mandarin Chinese (native), Spanish (proficient)**Programming:** C/C++, Java, Python**Web:** HTML, CSS, Javascript, PHP, MySQL**Computing:** Mathematica, Matlab, Maple**Typesetting:** L<sup>A</sup>T<sub>E</sub>X