

# Xiaoyu He

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- EDUCATION**      **Harvard College**      September 2012 - May 2016
- ★ B.A. Mathematics, secondary Computer Science. GPA: 3.89
  - ★ **Math Classes:** Linear and Abstract Algebra, Real and Complex Analysis, Advanced Complex Analysis, Commutative Algebra, Algebraic Number Theory, Analytic Number Theory, Algebraic Topology, Algebraic Geometry, Topics in Arithmetic Statistics, Differential Geometry.
  - ★ **Computer Science Classes:** Compilers, Operating Systems, Machine Learning, Economics and Computation, Advanced Algorithms, Data Systems.
- RESEARCH**      **GP-Free Sequences with Small Gaps**      June-December 2014
- ★ Supervised by Joe Gallian at Duluth REU.
  - ★ Probabilistic methods to construct sequences of interest in multiplicative number theory.
  - ★ Independent follow-up paper written over winter 2014.
  - ★ Xiaoyu He, Geometric-progression free sequences with small gaps, *J. Number Theory* 151 (2015), 197-210.
  - ★ Xiaoyu He, Geometric-progression free sequences with small gaps II, submitted for publication, arXiv:1503.06906 (2015).
- Generalized Erdős-Ginzburg-Ziv Problems**      Summer 2014
- ★ Supervised by Joe Gallian at Duluth REU.
  - ★ Extension of group algebra approach to prove linear bound on zero-sum sequences of prescribed length in general  $p$ -groups.
  - ★ Xiaoyu He, Zero-sum subsequences of length  $kp$  in finite abelian  $p$ -groups, accepted for publication, arXiv:1503.06905 (2015).
- Cross Number Invariants of Finite Abelian Groups**      Summer 2013
- ★ Supervised by Joe Gallian at Duluth REU.
  - ★ Inductive methods to prove a tight bound on the cross numbers of a large family of finite abelian groups, including many cyclic groups.
  - ★ Xiaoyu He, Cross number invariants of finite abelian groups, *J. Number Theory* 136 (2014), 100-117.
- Universal Rotor-Routers**      Spring 2011
- ★ Research project supervised by Tanya Khovanova at MIT-PRIMES for high school students.
  - ★ Computational methods for showing the universality of a large class of simple rotor-routers. Problem proposed by James Propp.
  - ★ Xiaoyu He, On the classification of universal rotor-routers, preprint, arXiv:1111.1459 (2011).

<b>SELECTED TALKS</b>	<b>Geometric Progression Free Sequences with Small Gaps</b>	26 May 2015
	<i>Dartmouth Number Theory Seminar</i>	
	<b>Counting Squarefree Numbers with the Sieve</b>	7 February 2015
	<i>Harvard-MIT Undergraduate Math Symposium</i>	
	<b>Geometric Progression Free Sequences with Small Gaps</b>	13 January 2015
	<i>AMS Session on Number Theory, III, Joint Math Meetings</i>	
	<b>Geometric Progression Free Sequences with Small Gaps</b>	18 January 2014
	<i>AMS Session on Combinatorics and Number Theory, Joint Math Meetings</i>	

<b>SELECTED AWARDS</b>	Robert Fletcher Rogers Prize	2015
	<i>Best Math Table Talk 2014-2015</i>	
	Google Code Jam Round 3	2014
	<i>Top 500 using only Python</i>	
	William Lowell Putnam Competition	
	★ N1	2013
	★ Honorable Mention	2012, 2014
	International Math Olympiad	
	★ Gold Medal	2010, 2011
	★ Silver Medal	2012
	USA Math Olympiad	
	★ Second Place	2010, 2011
★ Perfect Score	2012	
Intel Science Talent Search Finalist	2012	
Davidson Fellow	2012	

<b>WORK EXPERIENCE</b>	Google Inc. Software Engineering Intern	Summer 2015
	Harvard University Course Assistant	January 2014 - May 2015
	<i>113: Complex Analysis, 114: Real Analysis, and 130: Classical Geometry.</i>	
	Jane Street Capital Trading Intern	Winter 2013
	MIT-PRIMES Circle Mentor	November 2013 - November 2014
	IdeaMath Year-round Program Instructor	September 2012 - November 2013