RYAN HOLBEN

CONTACT

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EDUCATION

University of California, Irvine 2013
Ph.D. in Mathematics

Colby College 2007
B.A. in Mathematics
B.A. in Physics, with Honors and Distinction, elected to ΣΠΣ
Magna Cum Laude

WORK EXPERIENCE

Visiting Assistant Professor August 2015 - Summer 2016
Furman University

- Classes: Differential Calculus, Integral Calculus, Finite Mathematics (Naive set theory, probability, statistics, game theory, Markov chains)
- Ran and wrote all aspects of the courses taught in a liberal arts environment, including choosing course direction, running problem solving sessions, recording teaching videos, and advising students. Classes taught were of sizes between 18 and 25 students.

Instructor Summer 2011, Summer 2012, Fall 2012, Winter 2014-Spring 2015
UC Irvine

- Classes: Pre-Calculus, Integral Calculus, Linear Algebra & Infinite Series, Elementary Differential Equations, Math for Economists
- Taught, held office hours, wrote curricula, wrote and graded exams, and wrote quizzes for all courses. Classes taught were of sizes between 30 and 240 students.
- Rewrote the suggested curriculum for multivariable function extrema in Math for Economists.

Teaching Assistant 2007-2013
UC Irvine

- Classes: Differential Calculus, Integral Calculus, Multivariable Calculus, Math for Economists, Boolean Algebra & Logic, Explorations in Functions & Modeling, Linear Algebra & Infinite Series, Abstract Math/Proof Writing, Linear Algebra, Real Analysis, Modern Graph Theory, Topology
- Wrote and graded quizzes for all classes, graded exams, and taught discussion sections with my own material.
- Improved the abstract math course by working closely with the professor on the curriculum. At my suggestion cardinality was added to the classes, coursework, and exams. This is essential material that is needed in later courses in the major, yet was not formally taught.

· Had complete freedom in Functions & Modeling, a math education course. Developed many group activities to help students work through the challenges of good teaching.

Research Assistant 2006-2007
Colby College

· Worked as research assistant in a physics lab, using chirped laser pulses to drive desired state transitions in sodium samples.
· Modified existing C++ code to drive experimental apparatus in collecting multiple dimensions of data. Ran experiments with our software, gave high-quality results precisely matching the theory.
· Numerically integrated models that we derived, and compared with known experimental data from scientific publications.

Teaching Assistant 2006-2007
Colby College

· Was asked to be a teaching assistant for Honors Calculus during senior year. The college only employs teaching assistants on rare occasions. Guided students through a wide survey of advanced mathematics as well as proof writing skills

CODING AND APPLIED WORK

Languages

· Python (Jupyter, Numpy, Pandas, Matplotlib, Seaborn, scikit-learn, Beautiful Soup, Flask), C/C++, Lua, Javascript, Processing.org

Other Technologies

· Random forests, SQL, MongoDB, Amazon Web Services, Git, Mathematica, LaTeX

Projects

· OKC - Scraped and databased profiles from OkCupid, and analyzed the demographics of those users. Project is ongoing, and aims to detect fake user profiles.

· Prettify - Converted the raw text notes for ICS-33 at UC Irvine to a beautiful and more easily navigated website. Major challenges included automatically differentiating between code, ASCII diagrams, and English language using contextual clues, so that we can apply syntax highlighting.

· RedditDB - Used Python and the PRAW module to scrape Reddit posting histories, saving to a Mongo database hosted through AWS. Simple analytics were then performed, providing interesting information about users and subreddits, which could then be queried through a public-facing website.

· Collatz - Produced data and algorithms to attack the Collatz conjecture, finding underlying patterns and testing theory. Coded in Python and Mathematica.

MATHEMATICAL RESEARCH

Interests

· Set theory, singular cardinal combinatorics, square principle, forcing axioms, tree properties, large cardinals and consistency strength.

Papers

· *On the consistency of the failure of square*, Ph.D. thesis, University of California, Irvine (2013).

- Π^2_1 *subcompact cardinals and the failure of* $\square(\aleph_{\omega+1}, < \omega)$, in preparation.

Talks Given

- February 2013 - UC Irvine, Logic in Southern California talk (NSF Grant DMS-1044150)
  Square at Singular Cardinals
- February 2013 - UC Irvine, Math Graduate Student Colloquium series
  A Friendly Introduction to Large Cardinals and Consistency Strength
- January 2013 - Joint Mathematics Meeting, Contributed talk
  Combinatorics at $\aleph_{\omega+1}$ *in Prikry-type extensions*
- October 2012 - UC Irvine, Seminar
  Silver's model for failure of SCH
- April 2010 - UC Irvine, Seminar series
  Kappa-Muslin sets, semi scales, and scales I & II

Conferences Attended

- January 2016 - Joint Mathematics Meeting, Seattle
- November 2015 - May 2016 - Logic in Southern California (Caltech, UC Irvine, UCLA)
- November 2014 - MAA Southern California-Nevada Section Meeting, Pomona College
- January 2013 - Joint Mathematics Meeting, San Diego
- Fall 2011 - Spring 2013 - Logic in Southern California (Caltech, UC Irvine, UCLA)
- June 2012 - Graduate Summer School in Set Theory (UC Irvine) - Large cardinals, inner models, and fine structure

HONORS & SERVICE

Teaching special sessions to advanced high school mathematics students, under the RTG NSF grant DMS-1044150. 2012-2013

Outstanding Mathematics Teaching Assistant Award, UC Irvine. 2011-2012

REFERENCES

Mark Woodard - mark.woodard@furman.edu

Martin Zeman - mzeman@math.uci.edu

Alessandra Pantano - apantano@math.uci.edu

Sarah Eichhorn - s.eichhorn@uci.edu