Daniel P. Keliher

Contact Information

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Interests

I am primarily interested in **number theory** and **arithemetic statistics**. I am also interested in arithmetic geometry, data analysis, and computational genomics.

Education

Tufts University, Medford, MA — September 2017 - Present
Ph.D program in Mathematics
Advisor: Robert Lemke Oliver

Brown University, Providence, RI — September 2013 - May 2017
Sc.B in Mathematics

Math Research Items

8. *Statistics on quartic extensions of function fields* (working title, in preparation)
7. *Comparing the density of D_4 and S_4 quartic extensions of number fields.* Joint with M. Friedrichsen. (ArXiv, submitted)

Computational Research

6. Daniel Nava Rodrigues, Pasquale Rescigno, David Liu, et. al. *Immunogenomic analyses associate immunological alterations with mismatch repair defects in prostate cancer*. Journal of Clinical Investigation. 2018.
5. Diana Miao, Claire A. Margolis, Natalie I. Vokes, et. al. *Genomic correlates of response to immune checkpoint blockade in microsatellite-stable solid tumors*. Nature Genetics 9, 1271. 2018.
4. David Liu, Philip Abbosh, Daniel Keliher, et. al. *Mutational patterns in chemotherapy resistant muscle-invasive bladder cancer*. Nature Communications 8 (1), 2193. 2017.
3. David Liu, Philip Abbosh, Daniel Keliher, et al. *Subclonal mutational heterogeneity and survival in cisplatin-resistant muscle-invasive blasser cancer*. Journal of Clinical Oncology 2017 35:15_suppl, 4512-4512.
2. David Liu, Daniel Keliher, Philip Abbosh, et al. *Analysis of matched pre and post cisplatin-treated muscle-invasive bladder cancer reveals a candidate cisplatin mutational signature* [abstract]. In: Proceedings of the American Association for Cancer Research Annual Meeting 2017; 2017 Apr 1-5; Washington, DC. Philadelphia (PA): AACR; Cancer Res 2017;77(13 Suppl):Abstract nr 2918.
1. Diana Miao, David Liu, Daniel Keliher, et al. *Meta-analysis of genomic predictors of response to immune checkpoint therapy in metastatic melanoma* [abstract]. In: Proceedings of the American Association for Cancer Research Annual Meeting 2017; 2017 Apr 1-5; Washington, DC. Philadelphia (PA): AACR; Cancer Res 2017;77(13 Suppl):Abstract nr 571.

Talks & Presentations

- *Comparing the number of D_4 and S_4 quartic extensions of function fields*, Maine-Québec Number Theory Conference, UMaine (October 2019)
- *Comparing the number of D_4 and S_4 extensions of global fields*, Graduate Student Conference in Algebra, Geometry, and Topology at Temple U. (May 2019)
- *Comparing the number of D_4 and S_4 extensions of a number field*, Palmetto Number Theory Series. (December 2018)
- Tufts University Math Graduate Student Seminar (3 Talks)
  - *Function Field Arithmetic (and some stats)* (October 2019)
  - *Some Results in Arithmetic Statistics* (October 2018)
  - *A Primer on Topological Data Analysis* (March 2018)
- *Mutational Signatures in Primary and Metastatic Prostate Cancer*, DFCI Van Allen Lab. (August 2016)
- *An Introduction to the Topology of Data*, DFCI Van Allen Lab. (July 2016)

Teaching Experience

Teaching Assistant/Instructor September 2017 - Present
Tufts University Department of Mathematics

- Fall 2019, Spring 2019: Discrete Math (TA)
- Summer 2019: Intro to Calculus (Instructor of Record)
- Fall 2018: Calculus I (Recitation Instructor)
- Summer 2018: SAT Math Course (Instructor of Record)
- Spring 2018: Abstract Algebra II (TA)
- Fall 2017: Abstract Algebra I (TA)

Undergraduate TA Experience September 2014 - May 2017
Brown University Department of Mathematics

- Spring 2017: Honors Linear Algebra
- Fall 2015: Mathematical Cryptography
- Fall 2014: Calculus II for Physics/Engineering

Employment

Researcher Summers, 2014 - 2016
Dana-Farber Cancer Institute, Boston, MA

- Research related to algorithms and mathematical methods for detecting mutational signatures
- Developed RNASeq deconvolution algorithms

Visiting Undergraduate Summers, 2014-2016
The Broad Institute of MIT and Harvard, Cambridge, MA

- I held a concurrent appointment at the Broad Institute while working at DFCI in the Garraway and Van Allen Laboratories.

Data Science Intern Summer 2013
Audax Health (now Rally Health), Washington, DC

- Created prediction models to recommend content to users

Computer Skills R, Python, LaTeX, Mathematica, Sage, Magma

Conference Participation

- Modular Forms, Arithmetic, and Women in Mathematics* (Emory U., November 2019)
- Midwest Arithmetic Geometry and Number Theory Series (Ohio State, October 2019)
- Maine-Québec Number Theory Conference* (UMaine, October 2019)
- CMI-HIMR Summer School in Computational Number Theory (U. Bristol, May 2019)
- PIMS Workshop on Arithmetic Topology (UBC, May 2019)
- Graduate Student Conference in Algebra, Geometry, and Topology* (Temple, May 2019)
- Upstate New York Number Theory Conference (Cornell, April 2019)
- Arizona Winter School (U. Arizona, March 2019)
- Palmetto Number Theory Series XXXI* (U. South Carolina, December 2018)
- Québec-Maine Number Theory Conference (U. Laval, October 2018)
- 2018 Chicago Summer Workshop: The roots of topology: miracles of algebraic geometry, braids and Hilbert's (still open) 13th problem (UChicago, June 2018)
- Connecticut Summer School in Number Theory/Arithmetic Geometry and Number Theory Conference (UConn, June 2018)
- 32nd Automorphic Forms Workshop (Tufts, March 2018)
- Maine-Québec Number Theory Conference (UMaine, October 2017)

(Denotes I gave a talk)*

Service

- Co-Organizer, Tufts Math Dept. Directed Reading Program, Fall 2019-present
  - Mentor for a DRP project on Elliptic Curves, 2019
- Organizer, Tufts Graduate Student Seminar, Spring 2018-present
- Tufts University Organization for Graduate Students in Mathematics (OGSM)
  - First-Year Representative, 2017-2018
  - Second-Year Representative, 2018-2019
- Camp Kesem at Brown University:
  - General Body member, AY 2015-2016
  - Treasurer, AY 2016-2017
  - Counselor, Summers 2016-2019