

Michael Musty

Ph.D. Candidate, Mathematics, Dartmouth College

© 55 Church Street, 03779 Piermont, New Hampshire USA ☎ (+1) 603 728 7903

✉ michaelmusty@gmail.com 🌐 <https://github.com/michaelmusty> 🔗 <https://www.linkedin.com/in/mjmusty>

Education

Ph.D. Mathematics , Dartmouth College, Hanover, New Hampshire, USA	expected 2019
M.Sc. Mathematics , University of Vermont, Burlington, Vermont, USA	2014
B.A. Mathematics/Scientific Computing , Boston College, Chestnut Hill, Massachusetts, USA	2008

Work Experience

Graduate Research and Teaching Assistant , Dartmouth College, Hanover, NH, USA	2014-Present
Graduate Research and Teaching Assistant , University of Vermont, Burlington, VT, USA	2012-2014
Adjunct Professor , Norwich University, Northfield, VT, USA	2011-2013
Seasonal Landscaper , JM Landscaping, Bradford, VT, USA	2000-2011
Shipping Assistant , Pleasant View Gardens, Loudon, NH, USA	2009-2010
Permanent Substitute Teacher , Merrimack Valley High School, Penacook, NH, USA	2009-2010
Graduate Research and Teaching Assistant , McGill University, Montreal, QC, Canada	2008-2009
Misc Laborer , Glen Farm, Piermont, NH, USA	1990-2000

Research Experience

2-Group Belyi Maps , Ph.D. Thesis	expected 2019
<ul style="list-style-type: none">Developed and implemented an algorithm to compute a database of 2-group Belyi maps up to degree 256Analyzed this data to steer conjectures about these objectsUsed this analysis to search for special number fields ramified only at 2Repository: https://github.com/michaelmusty/solvabledessinsVisualization: https://dessin-explorer.org	
Computing Canonical Rings of Hilbert Modular Forms , Programmer	2018
<ul style="list-style-type: none">Implemented the data structure to store and compute with Fourier expansions of Hilbert modular formsWorked as part of a 10+ person teamOrganized the (git) workflow of the teamRepository: https://github.com/edgarcosta/hilbertmodularforms	
A Database of Belyi Maps , Co-author	2018
<ul style="list-style-type: none">Implemented the database backend using MagmaComputed thousands of Belyi maps up to degree 9Worked in a team of 4 people to migrate this data over to the LMFDB (www.lmfdb.org)Wrote Magma and Python scripts to convert this Magma database to MongoDB as part of the migrationAwarded Selfridge Prize at ANTS-XIII: http://www.math.grinnell.edu/~paulhusj/ants2018/index.htmlRepository: https://github.com/michaelmusty/BelyiDBLMFDB: http://beta.lmfdb.org/BelyiPeer-Reviewed Article: [Mus+19]	
Understanding the cost of dermatologic care: A survey study of dermatology providers, residents, and patients , Co-author	2017
<ul style="list-style-type: none">Carried out the statistical analysis for survey data of this study using RGenerated Likert scale visualizations to analyze the study data using RPeer-Reviewed Article: [Ste+17]	
Numerical calculation of three-point branched covers of the projective line , Co-author	2014

- Implemented a general numerical method to compute Belyi maps using power series expansions of modular forms
- Implemented code to visualize dessins d'enfants (equivalent objects to Belyi maps) conformally embedded in the hyperbolic unit disk
- Used this code to produce figures drawn using PSTricks such as in Figure 1
- Peer-Reviewed Article: [Klu+14]

Computing Iwasawa λ -Invariants, M.Sc. Thesis

2014

- Implemented an algorithm to compute the Iwasawa λ -invariant of an abelian number field using Magma
- Repository: <https://github.com/michaelmusty/iwasawa>

Publications Peer-Reviewed Articles

- [Mus+19] A Database of Belyi Maps
Michael Musty, Sam Schiavone, Jeroen Sijsling, John Voight
(to appear in conference proceedings for ANTS-XIII) *The Open Book Series* 2 (2019). Mathematical Sciences Publishers, 2019
- [Ste+17] Understanding the cost of dermatologic care: A survey study of dermatology providers, residents, and patients
Aaron J Steen, Julianne A Mann, Valerie M Carlberg, Alexa B Kimball, Michael J Musty, Eric L Simpson
Journal of the American Academy of Dermatology 76.4 (2017) pp. 609–617. Elsevier, 2017
- [Klu+14] Numerical calculation of three-point branched covers of the projective line
Michael Klug, Michael Musty, Sam Schiavone, John Voight
LMS Journal of Computation and Mathematics 17.1 (2014) pp. 379–430. London Mathematical Society, 2014

Selected Talks

- [1] 2-Group Belyi Maps
JMM Special Session on Number Theory, Arithmetic Geometry, and Computation, Baltimore, MD, January 2019
- [2] A Database of Belyi Maps
Simons Collaboration Short Talks, Cambridge, MA, August 2018
- [3] 2-Group Belyi Maps
Quebec Maine Number Theory Seminar, October 2017
- [4] Computing Iwasawa λ -Invariants
Dartmouth Number Theory Seminar, Hanover, NH, February 2015

Community

- Dartmouth Mathematics Youth Summer Program**, Guest Lecturer, Hanover, NH, USA 2016
- Gave 2 guest lectures on probability
 - Gave 2 guest lectures on knot theory
- Johns Hopkins Program for Talented Youth**, Guest Lecturer, Hanover, NH, USA 2015
- Gave a guest lecture on group theory
- Joshua M. Stimson Math Program**, Organizer, North Haverhill, NH, USA 2011-2012
- Organized a 4 week summer program in mathematics for advanced middle school students
 - Organized and taught the summer program in 2011 and 2012

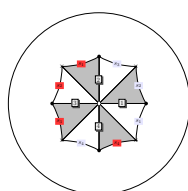


Figure 1: A genus 1 dessin d'enfant drawn using \LaTeX and PSTricks.