Michael Levet

Curriculum Vitae

Education

Aug. 2019–Present **Ph.D. Computer Science**, *University of Colorado- Boulder*,
Advisor: Joshua A. Grochow.

Aug. 2015–Dec. 2018 **M.E. Computer Science and Engineering**, *University of South Carolina- Columbia*.

Aug. 2016–May 2018 **M.S. Mathematics**, *University of South Carolina- Columbia*,
Advisor: Linyuan Lu.
Thesis: Graph Homomorphisms and Vector Colorings

Aug. 2011–May 2015 **B.S. Mathematics**, *Virginia Tech*,
Applied Discrete Mathematics Option.
Minor- Computer Science

Aug. 2011–May 2015 **B.A. Economics**, *Virginia Tech*.

Research Interests

Pure Math Algebraic Combinatorics, Computational Complexity, Computational Group Theory, Quantum Computation, Spectral Graph Theory

Interdisciplinary Microeconomic Theory, Game Theory

Research Experience

Research Assistant, *Joshua A. Grochow*.

- May-June 2020: Weisfeiler–Leman for Groups.
- January-May 2021: Code Equivalence and Weisfeiler–Leman; Parallel Algorithms for Group Isomorphism.

June-August 2014 **Network Dynamics and Simulation Science Lab**, *Biocomplexity Institute of Virginia Tech*, Blacksburg, Virginia.

I worked as an undergraduate research intern under Dr. Henning Mortveit studying dynamical systems over graphs. My contributions included Python simulations modeling the dynamical systems, exploring potential applications of spectral graph theory to graph dynamical systems, and results related to short term activity of the discrete dynamical systems. I contributed to a research paper entitled *Network Structure and Activity in Boolean Networks*, which was accepted by the Automata 2015 Conference. We were invited to submit an extended version of our work to the *Journal of Natural Computing*. Our extended journal publication is entitled *Activity in Boolean Networks*.

Publications

2021 **Michael Levet**- *On the Combinatorial and Parallel Complexity of Testing Group Isomorphism* (In Preparation)

2021 Lijun Chen, Joshua A. Grochow, Ryan Layer, **Michael Levet**- *Mastery-based and standards-based grading in a large, undergraduate Intro to Algorithms course: a case report* (Submitted)

2017 Abhijin Adiga, Hilton Galyean, Chris J. Kuhlman, **Michael Levet**, Henning S. Mortveit, Sichao Wu- *Activity in Boolean Networks*, Journal of Natural Computing

2016 **Michael Levet**, Siddharth Krishnan- *A Mechanism Design Approach For Influence Maximization*, Proceedings of GameNets 2016

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2015 Abhijin Adiga, Hilton Galyean, Chris J. Kuhlman, **Michael Levet**, Henning S. Mortveit, Sichao Wu- *Network Structure and Activity in Boolean Networks*, Proceedings of Automata 2015

Teaching

University of Colorado- Boulder

Spring 2021 CSCI 4900 Directed Study in Computational Complexity (Instructor)

Fall 2020 CSCI 3104 Algorithms- GTA (20 hours; collaborated with the course instructors to implement Standards-Based Grading to a class of more than 250 students.)

Spring 2020 Math 3140 Abstract Algebra- GTA (5 hours)

Spring 2020 CSCI 3104 Algorithms- GTA, Emergency Co-Instructor (20 hours; collaborated to implement Standards-Based Grading to a class of more than 330 students.)

Fall 2019 CSCI 3104 Algorithms- GTA (20 hours)

Fall 2019 CSCI 3434 Theory of Computation- Lead GTA (5 hours)

Johns Hopkins Center for Talented Youth

Summer 2020 Proving What Can't Be Proven (Instructor of Record- 4 sessions; piloted hybrid online course)

Summer 2019 Fundamentals of Computer Science (Instructor of Record- 2 sessions; flipped classroom model)

Summer 2018 Probability and Game Theory (Instructor of Record)

Summer 2018 Theory of Computation (Instructor of Record)

University of South Carolina

Summer 2019 Math 111 Basic College Mathematics

Spring 2019 Math 141 Calculus I (1 Section)

Spring 2019 Math 122 Calculus for BA and Social Sciences- Instructor of Record (1 Section)

Spring 2019 Math 170 Finite Mathematics- Instructor of Record (2 Sections)

Fall 2018 Math 122 Calculus for BA and Social Sciences- Instructor of Record (3 Sections)

Fall 2018 Math 170 Finite Mathematics- Instructor of Record (1 Section)

Spring 2018 Math 122 Calculus for BA and Social Sciences- Instructor of Record

Fall 2017 Math 115 Precalculus- Instructor of Record
Summer 2017 CSCE 355 Foundations of Computation- Instructor of Record
Spring 2017 Math 141 Calculus I (2 sections)- GTA
Fall 2016 Math 142 Calculus II (2 sections)- GTA
Summer 2016 Graduate Tutor- Math Tutoring Center
Summer 2016 CSCE 355 Foundations of Computation- Instructor of Record
Spring 2016 CSCE 551 Theory of Computation- GTA
Spring 2016 CSCE 146 Algorithmic Design II- GTA
Fall 2015 CSCE 355 Foundations of Computation- GTA
Fall 2015 CSCE 145 Algorithmic Design I- GTA

Virginia Tech

Spring 2015 CS 4114 Formal Languages and Automata Theory- UTA
Fall 2014 CS 4124 Theory of Computation- UTA

Substitute Lecturer- University of South Carolina

Math 111 College Algebra
Math 170 Finite Mathematics
Math 374 Discrete Structures
SCHC 212 The Mathematics of Game Shows

Substitute Lecturer- University of Colorado Boulder

Fall 2019 CSCI 3104 Algorithms (two classes- lectured on NP-Completeness)
Fall 2019 CSCI 3434 Theory of Computation (one class- lectured on Ladner's Theorem)

Private Tutoring

Math 111I College Algebra (Intensive)
Math 122 Calculus for BA and Social Sciences
Math 142 Calculus II
Math 170 Finite Mathematics
Math 174 Discrete Mathematics for Computer Science
Math 221 Basic Concepts of Elementary Mathematics I
Math 374 Discrete Structures
Math 574 Discrete Mathematics
CSCE 146 Algorithmic Design II
CSCE 355 Foundations of Computation

Mentorship

Spring 2021 **Computational Complexity**, Justin Cai, Ian Jorquera.
Summer 2020 **Group Theory and Algebraic Combinatorics**, Ian Jorquera, Luke Westmark.

Summer 2020 **Introduction to Mathematical Proofs**, Angel Dong, Ian Jorquera, Michelle Tran, Luke Westmark.

Summer 2016 **Group Theory and Algebraic Combinatorics**, Caleb Kisby.

Selected Relevant Coursework

University of Colorado- Boulder

Math 6110- Elementary Number Theory

Math 6270- Group Theory

Math 8114 Topics in Number Theory- The Arithmetic of Elliptic Curves

Math 6150- Commutative Algebra

CSCI 7000- Representation Theory of the Symmetric Group

University of South Carolina

Math 701-702 Algebra

Math 761 Computational Complexity

Math 778C Combinatorial Complexity

Math 774-775 Discrete Mathematics

Math 776-777 Graph Theory

Math 778S Spectral Graph Theory

CSCE 790 Quantum Computation and Information

CSCE 798 Directed Study: Algebraic Combinatorics

Virginia Tech (Undergraduate Courses denoted by *)

Math 5454 Graph Theory

CS 4124 Theory of Computation*

CS 5114 Theory of Algorithms

Econ 5005-5006 Microeconomic Theory

Econ 6004 Strategic Behavior

ISE 6414 Integer Programming

Work Experience

August 2018-July 2019 **Instructor**, *University of South Carolina- Math Department*, Columbia, SC.

June-August 2018, 2019 **Instructor**, *Johns Hopkins Center for Talented Youth*.
I taught Theory of Computation (TCOM) from June 24-July 13, 2018; Probability and Game Theory (GAME) from July 15-August 3, 2019; and Fundamentals of Computer Science (FCPS) during both summer sessions in 2019. My responsibilities included developing lesson plans and assignments for 105 contact hours per course, grading student work, writing student evaluation narratives, and managing a course teaching assistant.

May-July 2015 **Web Engineering Intern**, *The Washington Post*, Washington D.C..
I worked on the Platform Tools Team in the Web Engineering Department. My contributions included the Metric Storage Architecture, as well as the Nile-CLI project. The Metric Storage Architecture's purpose was to process metrics from internal company applications and submit them to Kafka and Datadog. I contributed to the team's architecture design decisions regarding this component, as well as explored the feasibility of different architectures. This culminated in a functional prototype to be incorporated into additional internal projects, as well as an internal architecture document outlining the design decisions and contrasting the explored approaches. Relevant technologies included the Mumrah Kafka-Python library, Apache's Java Kafka API, the Datadog API, and DogStatsD.

My contributions to the Nile-CLI project included a Python back end to automate deploying applications to the internal Nile platform. This project encompassed the entire deployment life cycle, including functionality for creating, deploying, halting, and deleting applications. Functionality to check application status was included. I also developed unit tests using the Nose and Mock frameworks for Python.

June 2010-August 2013 **Software Development Intern**, *G3 Systems, Inc.*, Richmond, VA.
I contributed to several projects, including developing proprietary technology for a patent, a student safety mobile application for VCU, and a contact sharing mobile application. In addition to developing Android applications for mobile phones, I also contributed to the software architecture process, designed and developed relational databases to support the applications, and engineered web services to support the mobile applications. Relevant technologies included Java, Android, XML, MySQL, and PHP.

Talks

April 26, 2019 **University of South Carolina- Columbia**, *Algebra and Logic Seminar*, Interactive Proofs.

February 8, 2019 **University of South Carolina- Columbia**, *Discrete Mathematics Seminar*, Graph Homomorphisms and Vector Colorings. .

March 10, 2017 **Deep Run High School**, *Glen Allen, VA*, I gave a guest lecture to high school seniors in an honors discrete mathematics course, where I introduced the Stable Marriage Problem and Gale-Shapley Algorithm. .

February 24, 2017 **University of South Carolina- Columbia**, *Discrete Mathematics Seminar*, I presented a paper entitled *Quaternionic quantum walks* by Norio Konno. .

September 23, 2016 **University of South Carolina- Columbia**, *Discrete Mathematics Seminar*, I presented a paper by Babai and Qiao entitled *Polynomial-time Isomorphism Test for Groups with Abelian Sylow Towers.*.

September 21, 2016 **University of South Carolina- Columbia**, *Women in Computing*, I gave a talk entitled *Math is Useful in CS? Are Euclidean Me?!* to help excite computer science students about mathematics. .

May 11, 2016 **6th EAI International Conference on Game Theory for Networks 2016**, *Kelowna, British Columbia, Canada*, I presented *A Mechanism Design Approach for Influence Maximization* by Michael Levet and Siddharth Krishnan, which is included with the conference proceedings..

January 6, 2016 **Deep Run High School**, *Glen Allen, VA*, I gave two guest lectures to high school seniors in an honors discrete mathematics course, where I introduced complexity theory. I discussed the P vs. NP problem and writing P-Completeness and NP-Completeness proofs. .

October 12, 2015 **University of South Carolina- Columbia**, *Discrete Mathematics Seminar*, I introduced Graph Dynamical Systems and presented the results from *Network Structure and Activity in Boolean Networks.*, by Abhijin Adiga, Hilton Galyean, Chris J. Kuhlman, Michael Levet, Henning S. Mortveit, Sichao Wu.

March, 2014 **Deep Run High School**, *Glen Allen, VA*, I gave a guest lecture was to a group of high school juniors and seniors in an AP Computer Science course, where I introduced finite state automata and regular expressions..

March, 2014 **Deep Run High School**, *Glen Allen, VA*, I gave a guest lecture was to a group of high school juniors and seniors in an honors discrete mathematics course, where I introduced group actions and graph automorphisms..

March, 2013 **Deep Run High School**, *Glen Allen, VA*, I gave a guest lecture to a group of high school juniors and seniors in an AP Computer Science class, where I provided a review session of object-oriented programming principles in Java in preparation for the AP exam.

Conferences and Seminars Attended

November 14, 2020 Triangle Lecture Series in Combinatorics

September 19-20, 2020 Palmetto Joint Arithmetic, Modularity, and Analysis Series

Fall 2020 CU Boulder Representation Theory of the Symmetric Group Reading Seminar (Co-Organized with Joshua A. Grochow)

June 5-6, 2020 Mastery Grading Conference

Spring 2020 CU Boulder Ulam Seminar- Primality Testing

January 2020 Joint Mathematics Meetings

May 20-25, 2018 NSF-CBMS Conference on Additive Combinatorics from a Geometric Viewpoint

May 11-12, 2016 6th EAI International Conference on Game Theory for Networks (GameNets 2016)

October 22-23, 2016 Atlanta Lecture Series in Combinatorics and Graph Theory

November 14-15, 2015 Atlanta Lecture Series in Combinatorics and Graph Theory

September 2015-May 2019 University of South Carolina- Discrete Mathematics Seminar

September 2015-May 2019 University of South Carolina- Algebra and Logic Seminar

Pedagogy Training

January 6, 2021 Techniques to Facilitate Real-Time Active Learning in Remote Courses Using Zoom and Google (CU Boulder)

January 2017-December 2018 Math 791-792 Mathematics Pedagogy for Graduate Student Instructors at University of South Carolina

Service

December 2020-Present Curricular Reform for CSCI 3104 Algorithms (CU Boulder)

Fall 2020 Graduate Student Support Staff Reform Committee (Chair, CU Boulder)

August 2020-Present Departmental Committee for Racial Justice, Equity, Diversity, and Inclusion (CU Boulder)

May 2020 Referee- FOCS 2020

May 2019 Proctor for practice AP Calculus Exam hosted by University of South Carolina Math Department.

May 2018 Proctor for practice AP Calculus Exam hosted by University of South Carolina Math Department.

April 2017 Proctor for practice AP Calculus Exam hosted by University of South Carolina Math Department.

Sept. 2018 - Present Reference letters written for students: 7.

Awards and Accomplishments

2019-2021 University of Colorado- Boulder (Dept. of Computer Science), Early Career Professional Development Fellowship ($1000)

2019-2020 University of Colorado- Boulder (Dept. of Computer Science), Departmental Fellowship ($4000)

2019 Johns Hopkins Center for Talented Youth Teaching Award

2019 University of South Carolina, Student Disabilities Resource Center- Two Thumbs Up Award.

2016 VT@CS Travel Scholarship to Present *A Mechanism Design Approach for Influence Maximization* at the GameNets 2016 Conference ($620).

2015 Nominated for Outstanding Undergraduate Teaching Assistant at Virginia Tech for CS 4114 Formal Languages and Automata Theory, in the Spring 2015 semester.

Memberships

American Mathematical Society.
Association for Women in Mathematics.
Upsilon Pi Epsilon.