Tung T. Nguyen

CONTACT INFORMATION

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RESEARCH INTERESTS

Algebraic number theory, representation theory of finite groups, spectral graph theory, nonlinear dynamics, and computational neuroscience.

EMPLOYMENT

Postdoctoral Associate in Mathematics, Western University and OnePick Inc 2021-

- Mentors: Professor Jan Minac and Professor Lyle Muller

EDUCATION

Doctor of Philosophy in Mathematics, The University of Chicago December 2020

- Advisor: Professor Kazuya Kato
- Thesis: Special values of L-functions over global fields

Master of Science in Mathematics, The University of Chicago 2016

- Advisor: Professor Kazuya Kato
- Topic proposal: p-adic L-functions of elliptic curves with complex multiplication

Bachelor of Science in Mathematics, Vietnam National University 2009-2014

- Senior thesis advisor: Professor Ralph Greenberg
- Senior thesis: On the norm of the fundamental units in real quadratic number fields.

AWARDS AND SCHOLARSHIPS

- PI4-IMA fellowship, 2020, UIUC.
- National Program for the Development of Mathematics scholarship, 2014.
- Honda Young Engineers and Scientists award for top 10 Vietnamese students in STEM fields, 2013.
- The prominent young students of Vietnam National University, 2013.

TEACHING EXPERIENCES

University of Chicago

- 2015-2016: College Fellow for IBL Honors Calculus.
- 2016-2017: 13100-13200-13300 (Elementary functions and calculus).
- 2017-2018: 13100-13200-13300 (Elementary functions and calculus).
- 2018-2019: MATH 15200-15300 (Elementary functions and calculus).
- Summer 2019: CAAP summer program at UChicago.
- 2019-2020: MATH 15100-15200 (Elementary functions and calculus).
- 2020-2021: MATH 15200 (Elementary functions and calculus, via Zoom).

Vietnam National University

- 2013: TA for a course in Galois theory (Professor Le Minh Ha.)
- 2014: Introduction to Statistics (Vietnam National University)

PUBLICATIONS

1. L. Muller, J. Minac, **Tung T. Nguyen**, *Algebraic approach to the Kuramoto model*. Physical Review E vol. 104 (2021).
2. **Tung T. Nguyen**, *Heights and Tamagawa numbers of motives*. Journal of Pure and Applied Algebra, 226(5), (2021).
3. Roberto Budzinski, **Tung T. Nguyen**, Gabriel B. Benigno, Jacqueline Doan, Jan Minac, Terrence J. Sejnowski, Lyle Muller, *A simple geometry unites synchrony, chimeras, and waves in nonlinear oscillator networks*. Chaos: An Interdisciplinary Journal of Nonlinear Science, 32(3), 031104, (2022).
4. Jacqueline Doan, Jan Minac, Lyle Muller, **Tung T. Nguyen**, Federico W. Pasini, Join of circulant matrices. To appear in Linear Algebra and its Applications, 2022. Available at https://arxiv.org/abs/2111.10059.
5. Jan Minac, Duy Tan Nguyen, **Tung T. Nguyen**, *Fekete polynomials, quadratic residues, and arithmetic.* To appear in Journal of Number Theory, 2022. Available at https://arxiv.org/abs/2111.05256

PREPRINTS

- Roberto C. Budzinski, **Tung T. Nguyen**, Gabriel B. Benigno, Jacqueline Doan, Jan Minac, Terrence J. Sejnowski, and Lyle E. Muller, A*nalytical prediction of specific spatiotemporal patterns in nonlinear oscillator networks with distance-dependent time delays*. Submitted, 2022.
- Roberto Budzinski, Jacqueline Doan, Jan Minac, Lyle Muller, **Tung T. Nguyen**, Federico Pasini, *Equilibria in Kuramoto oscillator networks: An algebraic approach*. Submitted, 2022. Available at https://arxiv.org/abs/2111.02568
- Frank Chemotti, Jan Minac, **Tung T. Nguyen**, Andrew Schultz, John Swallow, Nguyen Duy Tan, *Quaternion algebras and square power classes over biquadratic extensions*. Submitted, 2022. Available at https://arxiv.org/abs/2112.06688
- Jan Minac, Duy Tan Nguyen, **Tung T. Nguyen**, *Further insights into the mysteries of the values of zeta functions at integers*. Submitted, 2022. Available at https://arxiv.org/abs/2108.08171
- Jan Minac, Duy Tan Nguyen, **Tung T. Nguyen**, *On the arithmetic of generalized Fekete polynomials*. Submitted, 2022. Available at https://arxiv.org/abs/2206.11778.
- Lauren Heller, Ján Mináč, **Tung T. Nguyen**, Andrew Schultz, Duy Tan Nguyen, *Galois module structure of some elementary p-abelian extensions*. Submitted, 2022. Available at https://arxiv.org/abs/2203.02604.
- Sunil Chebolu, Jon Merzel, Jan Minac, Lyle Muller, Federico Pasini, **Tung T. Nguyen**, Duy Tan Nguyen, *On the joins of group rings* (preprint, available upon request).

SELECTED TALKS

- Connecticut Number Theory 2022 Conference, June 2022.
- New Developments in Number Theory, February 2022.
- UIC Number Theory Seminar, February 2022.
- Northwestern Number Theory Seminar, December 2021.
- Algebra Seminar, Binghamton University, November 2021.

- AMS Fall Western Sectional Meeting, October 2021.
- Undergraduate colloquium, Illinois State University, October 2021.
- First SIBAU-NU Workshop on Matrix Analysis and Linear Algebra, October 2021.
- Mathematics and Statistics Colloqium, Loyola University, October 2021.
- Invited talk at Williams SMALL REU 2021, join of circulant graphs. Also had an open discussion about my experiences in mathematics and shared some personal advice for undergraduate students.
- Young Researchers in Algebraic Number Theory, August 2021.
- Hanoi, Chicago, Boston and Western: A panoramic view of absolute Galois groups (joint talk with Jan Minac), joint seminar between
  - Mini-workshop on Algebra and homogeneous spaces
  - Online seminar on quadratic forms, linear algebraic groups and beyond
- Fekete polynomials, quadratic residues, and arithmetic, GTA Philadelphia 2021, Temple University, May 2021.
- Heights and Tamagawa numbers of motives, Algebra Seminar, Western University, February 2021.
- Hurwitz zeta functions, What is ... a seminar? February 2021.
- Special values of the Riemann zeta function at negative integers, The Trojan Math Seminar, Troy University, December 2020.
- Heights and Tamagawa numbers of motives, HUJI-BGU Number Theory Seminar, December 2020.
- Heights and Tamagawa numbers of mixed motives, Interactions between Representation Theory and Algebraic Geometry, Chicago 2017 (poster session).

SERVICES

- Co-supervised an undergraduate student, Lewis Glabush, toward his senior thesis (with Prof. Jan Minac and Prof. Lyle Muller).
- Co-organizer of the Algebra Seminar at Western University (with Prof. Jan Minac).
- Co-supervised four students in the Fields Undergraduate Summer Research Program 2021 (with Prof. Jan Minac and Prof. Lyle Muller).
  - Students: Anna Krokhine, Chun Hei Lam, Ton Meesena, William I Jones.
  - Project: Spectrum of almost complete digraphs.
  - Completing a paper on spectral graph theory and matrix algebra.
- Co-organizer and speaker for the following learning groups at UChicago: etale cohomology (Fall 2015) and p-adic Hodge theory (Winter and Spring 2017).
- Mentored 3 projects for the Directed Reading Program (Spring 2016 and Fall 2017, Spring 2019).
  - Michael Cronin: Modular arithmeitcs.
  - Benjamin Andrew: Elementary number theory.

- Xingyu Wang: p-adic numbers and applications.

- Mentored three REU projects at UChicago (Summer 2016).
  - Hung Ho: Gaussian integers.
  - Christopher Wilson: A brief introduction to ZFC.
  - Mantas Mazeika: The singular value decomposition and low rank approximation.

RELEVANT COURSEWORK

Course Design and College Teaching (CCTE 50000). The main goals of this course are.

- Reflect critically on and improve their teaching practice.
- Design an inclusive and well-conceived course based in meaningful learning objectives and conctructed with teaching methods and assessments aligned with those objectives.
- Articulate a meaningful student-centered approach to teaching.

COMPUTER SKILLS

• Python • Machine learning • Probabilistic programming with PyMC3 • Matlab

REFERENCES

Prof. Kazuya Kato
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Prof. Lyle Muller
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Dr. John Boller (teaching)
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Prof. Sunil Chebolu
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