Jungbae Nam

Research Interests

Arithmetic and statistics of the special L-values of modular forms; Computational algebraic/analytic number theory; Post-quantum cryptography

Skills and Abilities

Languages: English, Korean

Computational Tools: Python, SageMath, PARI/GP, C/C++, CUDA, Maple

Education

Ph.D. Mathematics & Statistics, Concordia University 2019
Supervisors: Prof. Hershy Kisilevsky, Prof. Chantal David

M.Sc. Mathematics & Statistics, Concordia University 2012
Supervisor: Prof. Hershy Kisilevsky

B.A. Mathematics & Statistics, Concordia University, 2009
Honours Project Supervisor: Prof. Hershy Kisilevsky

Research Experiences

Independent Researcher Jun. 2020 - Present

Project #1: Computed a huge amount of the central elliptic L-values of higher order twists by using FLINT, PARI/GP and CUDA and create their database on Web for public access (`https://jbnam.github.io`).

Project #2: Using the L-values computed in the previous project, invested their statistics (Collaborator: Prof. Hershy Kisilevsky).

Project #3: Computed non-negative integers representable as sum of two squares and singular series with Euler products to explain some bias for consecutive pairs of them in the arithmetic progression (Collaborators: Prof. Chantal David, Prof. Lucile Devin, Jeremy Schlitt).

Research Assistant Professor, Mathematics & Statistics, Concordia University 2019 - May 2020

Project: Computed and conjectured the moments of central elliptic L-values for cubic twists (Collaborators: Prof. Chantal David, Prof. Matilde Lalín).
Mentors: Prof. Hershy Kisilevsky, Prof. Chantal David

Ph.D. Research Assistant, Mathematics & Statistics, Concordia University 2014 - 2019

Projects: Computed the critical L-values of primitive forms of even weight twisted by odd prime characters and proved nonvanishing theorem for them using analytic/algebraic techniques.
Supervisors: Prof. Hershy Kisilevsky, Prof. Chantal David

Master Research Assistant, Mathematics & Statistics, Concordia University 2010 - 2012

Project: Derived the ratio conjecture for the ratios of central L-values of a family of twists of elliptic curves and supported the conjecture by numerical data.
Supervisor: Prof. Hershy Kisilevsky

Publications

H. Kisilevsky with Appendix by J. Nam — Preprinted Sep. 2021
Title: *Small Algebraic Central Values of Twists of Elliptic L-Functions*

C. David, L. Devin, J. Nam, J. schlitt — Math. Ann., Nov. 2021
Title: *Lemke Oliver and Soundararajan bias for consecutive sums of two squares*

C. David, M. Lalín, J. Nam — Exp. Math., p. 1-28, Jul. 2021
Title: *Conjecture for Moments Associated with Cubic Twists of Elliptic Curves*

Ph.D. Thesis Mathematics & Statistics, Concordia University — 2019
Title: *Critical L-values of Primitive Forms Twisted by Dirichlet Characters*

M.Sc. Thesis Mathematics & Statistics, Concordia University — 2012
Title: *Heuristic Results for Ratio Conjectures of* $L_E(1,\chi)$

Teaching Experiences

Assistant in a Senior/Master Project, Mathematics & Statistics, Concordia University — 2019
Responsibilities: Advise them to compute huge arithmetical data for elliptic curves and their statistics using Sage and Pari/GP

Course Instructor, Mathematics & Statistics, Concordia University — 2014 - May 2020
Courses: Algebra & Functions: College Algebra; Differential & Integral Calculus I

Teaching Assistant, Mathematics & Statistics, Concordia University — 2010 - 2012, 2014 - 2018
Courses: Linear Algebra I & II; Differential Equations; Elementary Number Theory;Operation Research I; Real Analysis I; Linear Algebra and Applications I;Techniques in Symbolic Computation

Tutor in Math Help Centre Mathematics & Statistics, Concordia University — 2010 - 2019

Honors and Awards

Research Assistantship CICMA, Concordia University (CAD 5,000/year) — 2010 - 2012, 2014 - 2018

Teaching Assistantship Concordia University (CAD 10,000/year) — 2010 - 2012, 2014 - 2018

ISM Graduate Scholarships Institut des Sciences Mathématiques (CAD 1,000) — 2010

Dean's List Concordia University — 2005 - 2007

New Millennium Scholarship Concordia University (CAD 1,000) — 2005

Seminars/Conferences

Séminaire Québec-Vermont Number Theory — 2012 - Present

Montréal Inter-University Seminar on Analytic Number Theory (MOBIUS ANT) — 2012 - Present

Number Theory Web Seminar (ntwebseminar.org) — 2020 - Present

Maine-Québec Number Theory Conference — 2012 - 2021

The Canadian Number Theory Association meeting (CNTA XV) — Jul. 2018

Workshop at Harvard: "Distribution of Modular Symbols and L-values" — May 2017

Workshop at Fields Institute: "Serre's Uniform Boundedness Conjecture" — Apr. 2016