Hamed Mousavi

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EDUCATION

PhD. Mathematics 2017-
Georgia Institute of Technology
Analytic Number theory
Thesis advisor: Ernie Croot (University of Georgia).

M.Sc. Mathematics 2016-2017
Sabanci University
Additive Number theory, Distribution of Ramanujan Coeffiecients in q-series
Thesis advisor: K. Kursungoz (Penn State).

Non-Degree. Mathematics 2015-2016
Tarbiat Modares University
Algebraic Number Theory.

M.Sc. Communication Engineering 2013-2015
Shiraz University of Technology
GPA: 18.17/20.00
Performance Study of Wireless Sensor Networks in Correlated Fading Channels.
Thesis advisor: J. Haghighat. (Concordia).

B.Sc. Pure Mathematics 2008-2013
Shiraz University
GPA: 17.50/20.00
Project:On distribution of prime numbers in Dirichlet's Theorem

RESEARCH

- Research interests

  I am interested in **analytic number theory**, especially in distribution of zeroes of Zeta functions, prime gaps, smooth numbers, q-series, and theta functions.

- Research Experiences

  11. Relation between distribution of zeroes of Riemann zeta functions and random matrices.
  10. Generalization of Pentagonal Number Theorem and its relation with Riemann Hypothesis.
  9. Study on partitions of n with parts less than k and their relation with smooth numbers.
  8. Study on Factorization Theorem on Lambert Series
  7. Generalization on Dirichlet's Theorem in Number Theory.
  6. Circle methods to find the number of different types of partitions
  5. Study on Power Management Schemes in Wireless Sensor Networks.
  4. Study on the structure and performance of Skew Cyclic Codes over Finite Rings.

3. Study on E-voting Methods Based on Elliptic Curves Cryptosystems.
2. Finding Upper Bound for the number prime factors of a prime ideals in an extension of rings of integers.
1. Study on Chain Conditions over Skew Rigid (or Domain) Rings.

PUBLICATIONS

- Journal Papers
  7. "Factorization Theorems for Relatively Prime Divisor Sums, GCD Sums and Generalized Ramanujan Sums", Submittd to The Ramanujan Journal, with Maxie Schmidt.arxiv link
  6. "The ascending chain condition for principal left or right ideals of skew generalized power series rings" Submitted to Algebra Colloquium, With A. Qureshi and F. Padashnik. arxiv link.
  5. Dastbasteh, R. Mousavi, H. Abualrub, T. Haghighat, J. "Characterization of the Skew cyclic codes over Fp + uFp". **International Journal of Information and Coding Theory**. here
  4. Mousavi, H. Moussavi, A. Rahimi, S. "Skew cyclic codes over $\mathbb{F}_p + v\mathbb{F}_p + v^2\mathbb{F}_p$". **Bulletin of Korean Mathematics**.here
  3. Mohammadi, R. Rahimi, S. Mousavi, H. " On Skew Cyclic Codes over a finite Ring". **Iranian Journal of Mathematical Science and Informatic**. here
  2. Mousavi, H. Ahmadi, B. Rahimi, S. (2016). "A New Approach to decrease the Computational complexity of E-voting protocols". **Transactions on Emerging Telecommunications Technologies**. here
  1. Mousavi, H. Haghighat, J. Hamuda, W. DastBaste, R. "Analysis of a Subset Selection Scheme for Wireless Sensor Networks in Time-Varying Fading Channels". **IEEE Transaction on Signal Processing**. here
- Conference Papers
  3. Mousavi ,H. Haghighat, J. Hamuda, W. "A Relay Subset Selection Scheme for Wireless Sensor Networks Based on Channel State Information". IEEE International Conference on Communications (**ICC 2016**). Malysia. here
  2. Mousavi ,H. Haghighat, J. Eslami, M. "A Relay Subset Selection Scheme for Wireless Sensor Networks for almost Quasi-static channels." second Iranian Conference on Communications Engineering (ICCE 2016). Shiraz. Iran.
  1. Farahmandnejad, M. Mousavi, H. Salehi Nowbandegani, P. Faridi, P. "Study the logical philosophical conformity of Iranian traditional medicine and their treatments". 14th Iranian Pharmaceutical Sciences Congress. 2015. Tehran, Iran.
- Works in Progress
  4. Real Case of Pentagonal Number Theorem and its relation with Riemann Hypothesis, with Ernie Croot.
  3. On Partitions of n with Parts less than k, with Ernie Croot.
  2. An exact formula for the number of partitions with parts of the form $pt + a$.
  1. On the structure of primary ideals of a non-Laskerian group ring. With A, Qureshi. R, Dastbasteh.

- Selected Talks

6. Pentagonal Number Theorem and Zeroes of Riemann Zeta Function, The Legacy of Ramanujan and in honor of Bruce Berndt's 80th birthday, University of Illinois at Urbana Champaign, Illinois, US. june 2019.
5. A Homomorphic E-Voting Protocol Based on El-Gamel Cryptosystem, Women In STEM Conference, Georgia State University, Atlanta, Georgia, US. April 2019
4. Number of Partitions with Parts of the Form $pt + a$, Integers Conference, Augusta, Georgia, US. October 2018.
3. Skew Cyclic Codes. Sabanci University. Turkey. May 2017.
2. Some famous conjectures on the density of prime numbers in polynomials with degree more than one. Shiraz university. Iran. June 2013.
1. Topology of Numbers. Mathematics workshop concurrent with the week of mathematics in Iran. Shiraz university. Iran. November 2011

TEACHING EXPERIENCES

- Teaching Assistant

11. Differential Equations, Spring 2018, Summer 2018, Spring 2019, Summer 2019.
10. Discrete Math, Spring 2017.
9. Linear Algebra, Fall 2016, Fall 2018.
8. Commutative Algebra , Spring 2016.
7. Advanced Algebra, Fall 2015, Fall 2014, Fall 2013.
6. Mathematics Analysis III, Spring 2014
5. Mathematics Engineering, Fall 2013
4. Algebra II, Spring 2011
3. Elementary Analysis, Fall 2010
2. Number theory, Fall 2010
1. Numerical Analysis, Fall 2010

- Instructor of Number Theory for IMO in Different High Schools, 2008-2015.
- Teaching Calculus for Statistics M.Sc Entrance in Shiraz University 2013.

RELATED ACTIVITIES AND SKILLS

- **Activities**

7. **George Andrew's 80th birthday**
   Participation in a conference in honor of George Andrew's 80th birthday, Penn State university, State college, Pensilvania, US (2018).
6. **Spring School on Analytic Number Theory**
   Courses: PNT, Modular forms, Combinatorics and ANT, Equidistributive results in ANT, Small gaps between primes, Sum of digits function and multiplicative structure, IPM, Tehran, Iran (2016).

5. **Langlands Correspondence**
   Participated in a Lecture aimed at Langlands Program, (Speaker: Dr. Sophie Morel), IPM, Tehran, Iran (2016).
4. **Root System Workshop**
   Participated in a short course aimed at Langlands program,(Speaker: Dr. Asgarzadeh), IPM, Tehran, Iran (2015).
3. **IWCIT**
   Participated in Iranian Workshop on Communication and Information Theory .Tehran. Iran(2014).
2. Co-leader of Mathematics team of Shiraz university for Iranian mathematics competition, Kerman, Iran, 2014.
1. **Prepration for Langlands Program**
   Courses: Class fields, Algebraic Geometry, Modular forms, Algebraic Number Theory, Analytic Number Theory, IPM, Tehran, Iran (2016).

- **Computer Skills**: Familiar with PARI, LaTeX, MatLab, Mathematica.

HONORS, AWARDS, AND MEMBERSHIPS

- Awards
  3. Top 3 Researcher Students (Gursel Award), Sabanci University, 2017
  2. Awarded NEFI (National Elite Foundation of Iran) gifted educational prize (2015)
  1. Awarded NEFI (National Elite Foundation of Iran) gifted educational prize (2014)
- Honors
  9. 18th in Mathematics Ph.D. entrance exam for state universities among over 3500 M.Sc. students,Iran, 2015.
  8. 30th in Mathematics M.Sc. entrance exam for state universities among over 15000 B.Sc. students,Iran, 2012.
  7. 3rd among 50 students in Bachelor of Science.
  6. 3th among 28 students in Master of Science.
  5. Gold medal in 36th Iranian Mathematics competition for university students (2012) Zanjan. Iran. **Iranian Mathematics society**
  4. Bronze medal in 35th Iranian Mathematics competition for university students (2011) Tehran. Iran. **Iranian Mathematic society**
  3. Silver Medal in 17th International Mathematic Olympiad for university students (2013) Isfahan. Iran. **Mathematic Olympiad**
  2. Bronze Medal in 17th Iranian Mathematic Olympiad for university students (2013) Tehran. Iran. **Mathematics Olympiad**
  1. Honorable Mention in 17th IMC(International Mathematic competition) for university students (2010) Blogoavgrad. Bulgaria.

- Memberships
    6. Member of scientific committee in 40th Iranian Mathematics competition for university student in summer 2016.
    5. Member of Iranian Mathematics Society, Since 2015
    4. Member of National team of Iran in 18th Local Mathematic Olympiad for University Students. Isfahan. Iran. 2013
    3. Member of National Elites Foundation of Iran since 2013
    2. Member of Brilliant Talent of Shiraz University of Technology since 2013
    1. Member of National Organization for Development of Exceptional Talents (NODET) for secondary and high school students

REFERENCES

- Professor Ernest Croot, (ernest.croot@math.gatech.edu)
- Professor Micheal Lacey, (lacey@math.gatech.edu)
- Dr Kagan Kursungoz, (kursungoz@sabanciuniv.edu)
- Dr Javad Haghighat (haghighat@sutech.ac.ir)
- Professor Henning Stichtenoth (henning@sabanciuniv.edu)