

Curriculum Vitae

Personal Information

- Jääsaari, Jesse Sebastian, born on May 14, 1992 in Helsinki, Finland.
- Finnish citizen
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Education

- January 2014–September 2018. Doctoral student at the Department of Mathematics and Statistics, University of Helsinki. Supervised by Dr. Anne-Maria Ernvall-Hytönen, Thesis defence 15 June, 2018, **passed with distinction** (thesis approved 4 September, 2018).
 - Title of the Doctoral dissertation: Exponential Sums Related to Maass Cusp Forms.
- Master of Science, University of Helsinki, September 2011–December 2013.
 - Major subject: Mathematics (Study line: Mathematical Analysis), GPA: 5/5.
 - Title of the Master's Thesis: *A Pretentious Approach to Estimating Character Sums*, Grade: Eximia cum laude approbatur (5/5). Supervised by Dr. Anne-Maria Ernvall-Hytönen.
- Bachelor of Science, University of Helsinki, September 2011–December 2013.
 - Major subject: Mathematics, GPA: 5/5.
 - Title of the Bachelor's Thesis: *Hölderin Lause* (in Finnish for *Hölder's Theorem*), Grade: 5/5. Supervised by Prof. Eero Saksman.
 - Minor subject: Theoretical Physics.
- High school graduate, Ressu Upper Secondary School, June 2011.

Research Interests

I am an analytic number theorist interested in automorphic forms, automorphic representations and L -functions related to those objects. I am also very interested in representation theory and spectral theory in this context. In my thesis I studied exponential sums weighted by the Fourier coefficients of cusp forms. In particular, I worked with higher rank automorphic forms, more specifically Maass forms for the general linear group $\mathrm{GL}(n, \mathbb{R})$. In addition, I am also interested in arithmetic and Galois representations, especially in the classical Langlands program.

List of publications

Research articles:

1. On Short Sums Involving Fourier Coefficients of Maass Forms. Preprint available at arXiv:1804.09702, 29 pages, Submitted.
2. (with E. V. Vesalainen) On Sums Involving Fourier Coefficients of Maass Forms for $SL(3, \mathbb{Z})$. *Functiones & Approximatio Commentarii Mathematici*, vol. 57, No 2 (2017), pp. 255 – 275.
3. (with E. V. Vesalainen) *Exponential Sums Related to Maass Forms*. Preprint available at arXiv:1409.7235, 58 pages. To appear in *Acta Arithmetica*.
4. (with A.-M. Ernvall-Hytönen and E. V. Vesalainen) *Resonances and Ω -Results for Exponential Sums Related to Maass Forms for $SL(n, \mathbb{Z})$* . *Journal of Number Theory*, 153 (2015), pp. 135 – 157.

Popular texts:

1. *Arvioita karakterisummille: Pólya–Vinogradovin epäyhtälö ja sen vahvennuksia* (in finnish for *Estimates for Character Sums: The Pólya–Vinogradov Inequality and Its Strengthenings*). 8 pages, (2015). *Solmu* 2/2015, pp. 28–33.

Theses:

1. Exponential Sums Related to Maass Cusp Forms. Doctoral dissertation, University of Helsinki, 2018. Available at <https://helda.helsinki.fi/handle/10138/235368>.
2. A Pretentious Approach to Estimating Character Sums. Master’s thesis, University of Helsinki, 2013. Available at <https://helda.helsinki.fi/handle/10138/42216>.
3. Hölderin lause. Bachelor’s thesis, University of Helsinki, 2013.

Work Experience

- September 1, 2013- January 13, 2014. Research assistant, Number Theory Finland-project. Funded by the Academy of Finland (co-ordinated by the University of Oulu).

Teaching experience

- I have marked exams for the following courses: Introduction to university mathematics (spring 2016), Calculus I (fall 2016, 2017), Algebra I (spring 2016), Introduction to logic (fall 2016) and Complex analysis I (fall 2014).
- Teaching assistant for the undergraduate level mathematics course *An Introduction to Number Theory*, fall 2015, University of Helsinki.
- Teaching assistant for the graduate level mathematics course *Kompleksianalyysin erikoiskurssi (A Special Course in Complex Analysis)*, spring 2015, University of Helsinki.
- Instructor in *Ratkomo*, spring 2015, University of Helsinki [Ratkomo is a room in the department of mathematics and statistics where an instructor is available for answering students questions concerning exercises of basically any course offered by the department].

- Teaching assistant for the graduate level mathematics course *An Introduction to Analytic Number Theory*, fall 2014, University of Helsinki.
- Teaching assistant for the undergraduate level mathematics course *Kompleksianalyysi I (Complex Analysis I)*, fall 2014, University of Helsinki.
- Teaching assistant for the undergraduate level mathematics course *Kryptografian alkeet (Elements of Cryptography)*, spring 2014, University of Helsinki.

Talks and Presentations

Research talks:

Invited talks:

- University of Turku Number Theory Seminar, *On short sums involving Fourier coefficients of cusp forms*, Turku, Finland, April 10, 2018.
- KTH Royal Institute of Technology Number Theory Seminar, *On the distribution of exponential sums related to automorphic forms*, Stockholm, Sweden, April 26, 2017.
- University of Copenhagen Number Theory Seminar, *On exponential sums involving Fourier coefficients of automorphic forms*, Copenhagen, Denmark, October 14, 2016.

Contributed talks:

- Finnish Mathematical Days 2018, *On short sums involving Fourier coefficients of cusp forms*, Joensuu, Finland, January 5, 2018.
- Journées Arithmétiques 2017, *On the distribution of exponential sums related to automorphic forms*, Caen, France, July 4, 2017.
- Finnish Number Theory Days 2017, Tampere, Finland, June 6, 2017.
- University of Turku Number Theory Seminar, *On the distribution of exponential sums related to automorphic forms*, Turku, Finland, December 14, 2016.
- University of Turku Number Theory seminar, *On Sums Involving Fourier Coefficients of Maass Forms for $SL(3, \mathbb{Z})$* , Turku, Finland, December 7, 2015.
- Finnish Number Theory Days, Espoo, Finland, *Exponential sums related to Maass forms*, May 28, 2015.
- Analytic Number Theory Workshop, Turku, Finland, *A Resonance Estimate and Related Ω -Result*, Turku, Finland, May 27, 2014

Expository talks:

- University of Helsinki Graduate Student Seminar, *Reciprocity laws*, 14 April, 2016.
- Aalto University Langlands learning seminar, *Representation theory of $GL(n, \mathbb{R})$* , 2 February, 2016.
- Aalto University Langlands learning seminar, *Tate's Thesis*, 21 January, 2016.
- University of Turku Number theory seminar, *Automorphic forms and Galois representations*, 9 November, 2015.

- University of Helsinki Automorphic forms learning seminar, *Automorphic representations for* $GL(1, \mathbb{A}_{\mathbb{Q}})$, 8 October 2014.
- University of Helsinki Automorphic forms learning seminar, *Fourier Analysis on* $\mathbb{A}_{\mathbb{Q}}$, 24 September 2014.
- University of Helsinki Graduate Student Seminar, *Modular forms*, 17 April, 2014.

Visits to universities

- 1 February - 30 April, 2017: Visiting graduate student at Kungliga Tekniska Högskolan (KTH), Stockholm, Sweden. Host: Pär Kurlberg.
- 10 – 15 October, 2016: Visit to University of Copenhagen, Copenhagen, Denmark. Host: Ian Kiming.

Participation in conferences and similar events

- Lukuteorian päivät 2013 (Finnish Number Theory Days 2013), Turku, Finland, 16 – 17 May, 2013.
- Fourth Finnish-Estonian Mathematics Colloquium and Finnish Mathematical Days 2014, Helsinki, Finland, 9 – 10 January, 2014.
- An Analytic Number Theory Workshop, Turku, Finland, 26 – 30 May, 2014.
- Mathematics Meets Physics on the occasion of Antti Kupiainen's 60th birthday, Helsinki, Finland, 24 – 27 June, 2014.
- 2nd EU/US Summer School on Automorphic Forms and Related Topics, Bristol, UK, 30 June-5 July, 2014. **Attended as a selected participant.**
- Analytic Number Theory Workshop, Oxford, UK, 29 September-3 October, 2014.
- The Clay Research Conference, Oxford, UK, 1 October, 2014
- Analytic aspects of number theory, Zürich, Switzerland, 18 – 22 May, 2015.
- Lukuteorian päivät 2015 (Finnish Number Theory Days 2015), Espoo, Finland, 28 – 29 May, 2015.
- Meeting for Young Mathematicians in Finland 2015, Espoo, Finland, 26 – 28 August, 2015.
- Finnish Mathematical Days 2016, Turku, Finland, 7 – 8 January, 2016.
- 27th Nordic Congress of Mathematicians, Stockholm, Sweden, 16–20 March, 2016.
- Introduction to Relative Aspects in Representation Theory, Langlands Functoriality and Automorphic Forms, CIRM, Luminy, France, 16 – 20 May, 2016. **Attended as a selected participant.**
- Conference on the Cohomology of Arithmetic Groups on the occasion of Joachim Schwermer's 66th birthday, Bonn, Germany, 6 – 10 June, 2016.
- Spectral theory, Automorphic forms and Arithmetic, Copenhagen, Denmark, 14 – 18 November, 2016.
- \mathbb{N}^3 -days VI, Copenhagen, Denmark, 2 – 3, June, 2017.

- Lukuteorian päivät 2017 (Finnish Number Theory Days 2017, Tampere, 5 – 6 June, 2017.
- XXX Journées Arithmétiques, Caen, France, 3 – 7 July, 2017.
- \mathbb{N}^3 -days VII, Stockholm, Sweden, 20 – 21 October, 2017.
- Finnish Mathematical Days 2018, Joensuu, Finland, 4 – 5 January, 2018.
- Perspectives on the Riemann hypothesis, Bristol, UK, 4–7 June, 2018, **Attended as a selected participant**.
- Hausdorff Summer School: L-functions: Open Problems and Current Methods, Bonn, Germany, 25 – 29 June, 2018, **Attended as a selected participant**.
- Elementare und Analytische Zahlentheorie, Bonn, Germany, 3–7 September, 2018.

Language Skills

- Finnish: Native Language, English: Fluent, German: Conversational, Swedish: Conversational.

IT-skills

- Matlab, Sage, L^AT_EX, Python, LibreOffice, Linux, Geogebra.

Awards, honours and grants

- Several travel scholarships from Doctoral programme in Mathematics of University of Helsinki.
- Travel scholarship of Magnus Ehrnrooth Foundation. Granted in March 2017.
- Funded position in Doctoral Programme in Mathematics and Statistics at University of Helsinki starting in January 2017. Granted in November 2016.
- Scholarship of the Finnish Cultural Foundation. Granted in February 2015.
- Scholarship of Vilho, Yrjö and Kalle Väisälä Foundation. Granted in November 2014. Declined due to the position in the Doctoral programme in mathematics.
- Funded position in Doctoral Programme in Mathematics and Statistics at University of Helsinki starting in January 2015. Granted in November 2014.
- Special award for an exceptional fast and successful completion of Master's degree, Awarded by the Faculty of Science, University of Helsinki, December 2013.
- Lydia and Karl G. Lindberg allowance for mathematical studies in Ressu Upper Secondary school, 2011.

Mathematical Competitions

As a contestant:

- Represented Finland at the 52nd International Mathematical Olympiad (IMO) in Amsterdam, the Netherlands, July 2011.
- Represented Finland at the Nordic Mathematical Competition in 2010 and 2011.

- Finnish National High School Mathematical Competition: 6th place in 2011 and 9th place in 2010.

As a trainer and a team leader:

- Trainer of the Finnish team for the International Mathematical Olympiad (IMO) since December 2011.
- Deputy Leader of the Finnish Team at the Second European Girls' Mathematical Olympiad (EGMO) in Luxembourg, April 2013.
- Deputy Leader of the Finnish Team at the 24th Baltic Way Mathematical Competition in Riga, Latvia, November 2013.
- Grader at the final of National Regional Mathematical Competition for 7th graders, Helsinki, Finland, March 6, 2014.
- Leader of the team from University of Helsinki at the 21st International Mathematics Competition (IMC). Blagoevgrad, Bulgaria, July 29- August 4, 2014.
- Deputy leader of the Finnish Team at the 57th International Mathematical Olympiad (IMO) in Hong Kong, July 2016.
- Coordinator at the Baltic Way team competition, Oulu, Finland, November 2016.

Other Teaching

- One of the organizers of the weekly problem solving mathematics club Tekijäryhmä. at the University of Helsinki. September 2014-May 2015.

Pedagogical Studies

- *Yliopistopedagogiikka I (University pedagogics I)*, 5 cr, University of Helsinki, fall 2014.
- *Yliopistopedagogiikka II (University pedagogics II)*, 5 cr, University of Helsinki, fall 2014.