Robert Thijs Kozma. **Curriculum vitae**

CONTACT INFORMATION

Department of Mathematics, Statistics,
and Computer Science
University of Illinois at Chicago
Chicago, IL 60607 USA

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EDUCATION

University of Illinois at Chicago, Chicago, IL

Ph.D. Mathematics, 2021

- Thesis: Central Limit Theorems and Packing Problems in Dynamics and Geometry
- Advisor: Professor Alex Furman

Stony Brook University, Stony Brook, NY

M.A. Mathematics, 2013

- Focus of Study: Holomorphic Dynamical Systems
- Graduate TA

Boston University, Boston, MA

B.A. Mathematics, Pure and Applied, 2010 GPA: 3.93 (4.0 scale)

- Summa cum Laude, With Distinction
- Thesis Topic: Julia sets of Perturbed Quadratic Maps
- Advisor: Professor Robert L. Devaney
- Area of Study: Dynamical Systems

INTERESTS

Ergodic theory, dynamical systems, hyperbolic geometry

PROFESSIONAL EXPERIENCE

Dept. Mathematics, Statistics, and Computer Science, UIC, Chicago IL
Research Assistant, Summer 2015
Advisor: Professor David Dumas.

Institute for Mathematical Sciences, Stony Brook NY
Research Assistant, Summer 2012
Advisor: Professor Mikhail Lyubich. Topic: Holomorphic dynamics.

ACIL Lab, Missouri University of Science and Technology, Rolla MO
Visiting Scholar, March – August 2011
Designed massively parallel hardware implementations of Fuzzy Logic based Adaptive Resonance Theory (ART) neural networks. Supervisor: Professor Donald C. Wunsch III

Neuromorphics Lab, Boston University, Boston MA
Research Assistant 2010 – 2011
Worked jointly with Boston University faculty and Hewlett-Packard Quantum Labs members on the DAPRA SyNAPSE Project

Work for Distinction Project, Dept. Mathematics, Boston University
2009 – 2010, Boston MA
Topic: Complex nonlinear dynamical systems. Advisor: Professor Robert L. Devaney

Tech Lab, Dept. Cognitive & Neural Systems, Boston University, Boston MA
Laboratory Assistant, Aug 2008 – May 2009
CELEST Project Work

Awards and Distinctions

US Junior Oberwolfach Fellow, 2018

New National Excellence Program 2018 Grant
Hungarian Ministry of Human Capacities
for "Regular horoball packings in higher dimensional hyperbolic spaces"

Chicago Consular Corps Scholarship, 2016
"The Chicago Consular Corps Scholarship was created in 2007 as an annual scholarship by the Chicago Consular Corps, which is comprised of 79 international consular representative offices within Chicago."

Richard V. Andree Award, 2012
Best undergraduate student paper 2011, Pi Mu Epsilon Journal
For "Julia Sets of Perturbed Quadratic Maps Converging to the Filled Basilica," Pi Mu Epsilon Journal, Issue 13:5, pp. 281-288 (2011)

Robert E. Bruce Memorial Prize for Excellence in Mathematics, 2010
Boston University

College Scholar, College of Arts & Sciences, 2009-2010
Boston University
Recognition of distinguished record of academic achievement. The awardee is among the top 5% of students in terms of academic accomplishments.

Undergraduate Research Opportunities Project (UROP) Award, 2009
To support research during the summer of 2009. Advisor: Prof. Emma Previato. The only award received by a Mathematics major student for this period. Award came with a $4000 stipend.

Dean's List, Fall 2008 – Spring 2010
College of Arts & Sciences, Boston University

Peer Reviewed Journal Publications

[1] Kozma R. T., Szirmai J. New Horoball Packing Density Lower Bound in Hyperbolic 5-space, *Geometriae Dedicata*, 206(1), pp. 1-25 (2019). doi:10.1007/s10711-019-00473-x

[2] Kozma R. T., Szirmai J. Symmetries of Horoball Packings Related to Famous 3-dimensional Hyperbolic Tilings, *Symmetry: Culture and Science*, Volume 27, No. 4, pp 261-278 (2016).

[3] Kozma R. T., Szirmai J. New Lower Bound for the Optimal Ball Packing Density in Hyperbolic 4-space, *J. Discrete and Computational Geometry*, Volume 53, Issue 1, pp 182-198 (2015). doi:10.1007/s00454-014-9634-1

[4] Kozma, R. T., Devaney, R. L. Julia Sets Converging to Filled Quadratic Julia Sets, *J. Ergodic Theory and Dynamical Systems*, Volume 34, Issue 01, pp. 171-184 (2014). doi:10.1017/etds.2012.115

[5] Kozma, R. T., Szirmai J. Optimally Dense Packings for Fully Asymptotic Coxeter Tilings by Horoballs of Different Types, *Monatshefte für Mathematik*, Volume 168, Issue 1, pp. 27-47 (2012) doi:10.1007/s00605-012-0393-x

[6] Kozma, R. T. Julia Sets of Perturbed Quadratic Maps Converging to the Filled Basilica, *Pi Mu Epsilon Journal*, Issue 13:5, pp. 281-288 (2011)

Conference Proceedings

[7] Kozma, R.T., Dense regular horoball packings in higher dimensional hyperbolic spaces, Discrete Geometry and Convexity in honour of Imre Bárány, Eds. Ambrus G., Böröczky K.J., Füredi Z., pp. 143-144, Budapest, Hungary (2017). ISBN 978-963-279-963-6

[8] Hayashi, I., Tsuruse, S., Suzuki, J., Kozma, R.T., A Proposal for Applying pdi-Boosting to Brain-Computer Interfaces, World Congress on Computational Intelligence (WCCI) / FUZZ-IEEE 2012, Brisbane, Australia (2012). doi:10.1109/FUZZ-IEEE.2012.6251152

[9] Kozma, R. T., Previato, E., Mathematical Principles of Coding Theory: On Automorphisms and Self-Duality of Codes Based on Elliptic Curves, 12th Annual Undergraduate Research Symposium, Boston University, October 16, 2009, pp. 106.

Book Chapters

[10] Versace,M., Kozma, R.T., Wunsch, D., Adaptive Resonance Theory design in mixed memristive-fuzzy hardware, Advances in Neuromorphic Memristor Science and Applications, Springer-Verlag (2012) doi:10.1007/978-94-007-4491-2_9

Conference Talks

2017 **Discrete Geometry and Convexity - Bárány 70**
Rényi Institute of Mathematics, Hungarian Academy of Sciences

2016 **Symmetry Festival 2016**
TU Wien, Vienna, Austria

2016 **Discrete Geometry Days**
Budapest University of Technology and Economics, Hungary

2016 **Chicago Area SIAM Student Conference (CASSC)**
University of Illinois Chicago, USA

2015 **Convex Geometry - Discrete and Computational**
Berlin Mathematical School (BMS), Berlin, Germany

2015 **Intuitive Geometry, László Fejes Tóth Centennial Conference**
Rényi Institute of Mathematics, Hungarian Academy of Sciences

2011 **International Joint Conference on Neural Networks (IJCNN)**
San Jose, CA

2010 **Young Mathematicians Conference**
Ohio State University, Columbus OH

Conference Participation

2019 **Midwest Dynamical Systems Seminar**
UIC, Chicago IL

2018 **Arbeitsgemeinschaft: Rigidity of Stationary Measure**
MFO, Oberwolfach, Germany

2017 **Graph limits, groups and stochastic processes**
Rényi Institute of Mathematics, Hungarian Academy of Sciences

2017 **Approximation, deformation, quasification**
Isaac Newton Institute, Cambridge, UK

2017 **Spring School on Analysis on Groups and Measured Group Theory**
Northwestern University, Evanston IL

2017 **School on Arithmetic Groups**
Ein Gedi, Israel

2016 **Midwest Dynamical Systems Seminar**
IUPUI, Indianapolis IN

2016 **Dynamics, Geometry and Number Theory**
Gregory Margulis' 70th birthday conference
Institut Henri Poincaré, Paris, France

2015 **Thematic Program on Boundaries and Dynamics**
Notre Dame University, Notre Dame IN

2012 **Workshop on Moduli Spaces Associated to Dynamical Systems**
ICERM, Brown University, Providence RI

2009 **International Joint Conference on Neural Networks (IJCNN)**
Atlanta GA

Seminar Talks

2015 New Density Bounds and Optimal Ball Packings for Hyperbolic Space
Graduate Geometry, Topology and Dynamics Seminar, UIC

2015 Chaotic dynamics of Perturbed Quadratic Maps
Graduate Analysis Seminar, UIC

2014 Limiting Behavior of Julia sets for Perturbed Quadratic Maps
Statistical Physics Seminar, Eötvös University (ELTE), Budapest, Hungary

2014 Limiting Behavior of Julia sets for Perturbed Quadratic Maps
Quantum Optics and Quantum Information Seminar, Wigner Research Center for Physics, Hungarian Academy of Sciences, Budapest, Hungary

2013 Limiting Behavior of Julia sets for Perturbed Quadratic Maps
Budapest – Wien Dynamics Seminar, Budapest University of Technology and Economics, Budapest, Hungary

2013 On the conjectured ball packing density upper bound in hyperbolic 4-space
Department of Geometry Seminar, Budapest University of Technology and Economics, Budapest, Hungary

2012 Julia sets of perturbed quadratic maps converging to filled Julia sets, I
Dynamical Systems Seminar, Chebyshev Laboratory, St. Petersburg State University, St. Petersburg, Russia

2012 Julia sets of perturbed quadratic maps converging to filled Julia sets, II
Steklov Mathematical Institute, Russian Academy of Sciences, St. Petersburg, Russia

2012 Julia Sets Converging to Filled Quadratic Julia Sets
Mini Course / Dynamics Learning Seminar, Stony Brook University

2012 Limiting Behavior of Julia Sets for Perturbed Quadratic Maps
Graduate Student Seminar, Stony Brook University

Teaching Experience

University of Illinois at Chicago, Chicago, IL

Teaching Assistant

- MATH 125 Business Linear Algebra
- MATH 180 Calculus 1
- MATH 181 Calculus 2
- MATH 210 Calculus 3
- STAT 101 Introduction to Statistics
- MATH 180/181 Worksheet Project:
  Worked with Director of Calculus Prof. Martina Bode to produce worksheet booklets used in the calculus discussion sections.
- Mathematical Sciences Learning Center tutoring

Stony Brook University, Stony Brook, NY

Teaching Assistant

- MAT 125 Calculus A
- MAT 132 Calculus 2
- MAT 141 Honors Calculus 1
- MAT 211 Linear Algebra

External Peer Review

Annali di Matematica Pura ed Applicata (Springer)
Linear Algebra and its Applications (Elsevier)

Professional Memberships

American Mathematical Society (AMS), Graduate Student Member

Service

Senator, Graduate Student Organization, Stony Brook University
Elected to represent the Mathematics Dept. Jan 2012 – May 2013.

Secretary, Student Chapter, Mathematical Association of America (MAA)
Boston University, for Academic year 2009 – 2010.

Founding member, Innoworks, Boston University Chapter
Organized summer science camps for underprivileged middle school students for 2009, 2010.

Computer Skills

Programming Languages

- Math: Mathematica, Matlab, Matlab Fuzzy Logic Toolbox, LaTeX
- General: C, C++
- 3D printing – modeling

Languages

Japanese (JLPT Level N1), English (Native), Hungarian (Native)

- Represented Boston University at the Boston Area Japanese Speech Competition.
- Japanese Language Proficiency Test (JLPT) Level 1 certification (highest level). Certified ability to fluently use approx. 2000 Kanji characters, and 10000+ words.
- 1st Place, Japan Foundation – Japanese Language and Culture Contest. Prize: 1 week trip to Japan.

References

Available upon request.