

Curriculum Vitae

Balázs Szegedy

October 2011

BIOGRAPHICAL INFORMATION

Personal:

Name: Balázs Szegedy

University address: University of Toronto 40 St George St. Toronto, ON, M5S2E4, Canada

Office phone: 416-978-6636

Degrees:

Undergraduate degree: 1998, Eötvös University, mathematics

PhD:

Year: 2003

Institution: Eötvös University

Title: On the Sylow and Borel subgroups of classical groups

Supervisor: Péter Pál Pálffy

Employment:

Present appointment: Associate Professor (Dept of Computer and Mathematical Sciences, University of Toronto at Scarborough)

Date of appointment: 2011

Previous positions:

- 2006-2011: Assistant Professor, University of Toronto at Scarborough
- 2005-2006: Member, Institute for Advanced Study
- 2003-2005: Post-doctoral Fellow at Microsoft Research
- 2002-2003: Young researcher position at Renyi Institute

Honours:

- Sloan Research Fellowship (2010)
- European Prize in Combinatorics (2009, Bordeaux), awarded biannually for excellent contributions to combinatorics by a European under the age of 35.

- Géza Grünwald memorial prize (2002), awarded annually (for excellent young researchers under the age of 30) by J. Bolyai Mathematical Society.
- Kató Rényi Prize (1997), awarded annually to undergraduates (for excellent research) by J. Bolyai Mathematical Society.

ACADEMIC HISTORY

Research endeavours:

My main research is in combinatorics and group theory. Recently I am working in a new field which deals with limits of discrete structures. This topic is connected to combinatorics, ergodic theory and probability theory.

Research awards:

- NSERC grant: \$22,000 per year for five years (started in 2008)
- Sloan Research Fellowship, 2010, total amount: \$50,000, duration: two years

SHOLARLY PUBLICATIONS

Refereed:

- B. Szegedy, 'Limits of kernel operators and the spectral regularity lemma' to appear in European Journal of Combinatorics
- L. Lovász, B. Szegedy 'Random graphons and weak positivenessatz for graphs', to appear in J. Graph Theory
- B. Szegedy, 'On the number of commuting pairs in Lie-algebras', to appear in Publ. Math. Debrecen
- L. Lovász, B. Szegedy, 'Finitely forcible graphons', to appear in J. Comb. Theory, B.
- B. Szegedy, 'Edge coloring models as singular vertex coloring models', Fete of combinatorics and computer science, Bolyai Soc. Math. Studies, (2010), Volume 20, 327-336
- L. Lovász, B. Szegedy, 'Regularity partitions and the topology of graphons', An Irregular Mind: Szemerédi is 70, Springer, (2010) 415-446
- L. Lovasz, B. Szegedy, 'Testing properties of graphs and functions', Israel J. of Math, 178 (2010), Number 1, 113-156
- K. Podolski, B. Szegedy, 'On finite groups whose derived subgroup has bounded rank', Israel J. of Math, 178 (2010), Number 1, 51-60
- B. Szegedy, 'The Symmetry preserving removal lemma', Proc. AMS, 138 (2010), no. 2, 405-408
- L. Lovasz, B. Szegedy, 'Connectors and contractors of graph algebras', J. Graph Theory 60 (2009), no. 1, 11-30
- B. Szegedy, 'Edge coloring models and reflection positivity', J. Amer. Math. Soc. 20 (2007), 969-988
- B. Szegedy, 'Coverings of Abelian groups and vector spaces', J. Combin. Theory Ser. A. 114 (2007), 20-34

- L. Lovasz, B. Szegedy, 'Szemerédi's regularity Lemma for the analyst', *Geom. Funct. Anal.* 17 (2007), no. 1, 252-270
- C. Borgs, J. Chayes, L. Lovasz, V. Sos, B. Szegedy and K. Vesztergombi, 'Graph limits and parameter testing' *Proceedings of the 38rd ACM Symposium on the Theory of Computing (STOC)* (2006). 261-270
- B. Szegedy, C. Szegedy, 'Symplectic spaces and ear decompositions of matroids', *Combinatorica* 26 (2006), no. 3, 353-377
- L. Lovasz, B. Szegedy, 'Limits of dense graph sequences', *J. Combin. Theory Ser. B* 96 (2006), 933-957 no. 6
- H. Cohn, R. Kleinberg, B. Szegedy, C. Umans 'Group-theoretic algorithms for matrix multiplication' *Proceedings of the 46th Annual Symposium on Foundations of Computer Science, 23-25 October 2005, Pittsburgh, PA, IEEE Computer Society*, pp. 379-388
- B. Szegedy, 'Almost all finitely generated subgroups of the Nottingham group are free', *Bull. London Math. Soc.* 37 (2005), no. 1, 75-79
- K. Podoski, B. Szegedy, 'Bounds for the index of the centre in capable groups', *Proc. Amer. Math. Soc.* 133 (2005), no. 3, 3441-3445
- M. Abert, N. Nikolov, B. Szegedy, 'Congruence subgroup growth of arithmetic groups in positive characteristic', *Duke Math. J.* 117, 2003, no. 2, 387-383
- B. Szegedy, 'Characters of the Borel and Sylow subgroups of classical groups', *J. Algebra* 267, 2003, no.1, 130-136
- K. Podoski, B. Szegedy, 'Bounds in groups with finite Abelian coverings or with finite derived groups', *J. Group Theory* 5 no. 4, 2002, 443-452
- S. Dasgupta, Gy. Karolyi, O. Serra, B. Szegedy, 'Transversals of additive Latin Squares', *Israel J. Math.* 126, 2001, 17-28
- B. Szegedy, 'Tilings of the Square with similar right triangles' *Combinatorica* 21, 2001, 139-144
- B. Szegedy, 'On the characters of the group of upper-triangular matrices' *J. Algebra* 186, 1996, 113-119

Under review:

- G. Elek, B. Szegedy, 'A measure theoretic approach to the theory of dense hypergraphs'

Unrefereed:

- Xiang Li, B. Szegedy 'On the logarithmic calculus and Sidorenko's conjecture', [ArXiv:1107.1153](https://arxiv.org/abs/1107.1153)
- L. Lovász, B. Szegedy 'The graph theoretic moment problem', [ArXiv:1010.5159](https://arxiv.org/abs/1010.5159)
- L. Lovász, B. Szegedy 'Limits of compact decorated graphs', [ArXiv:1010.5155](https://arxiv.org/abs/1010.5155)
- B. Szegedy 'Gowers norms, regularization and limits of functions on abelian groups', [ArXiv:1010.6211](https://arxiv.org/abs/1010.6211)
- O. Antolin C., B. Szegedy, 'Nilspaces, nilmanifolds and their morphisms', [ArXiv:1009.3825](https://arxiv.org/abs/1009.3825)

- B. Szegedy 'Higher order Fourier analysis as an algebraic theory I.', ArXiv:0903.0897
- B. Szegedy 'Higher order Fourier analysis as an algebraic theory II.', ArXiv:0911.1157
- B. Szegedy 'Higher order Fourier analysis as an algebraic theory III.', ArXiv:1001.4282
- B. Szegedy 'Structure of finite nilspaces and inverse theorems for the Gowers norms in bounded exponent groups', ArXiv:1011.1057

Manuscripts in preparation:

- O. Angel, B. Szegedy 'On the recurrence of the weak limits of discrete structures'
- H. Hatami, L. Lovász, B. Szegedy, 'On the limits of sparse graphs'
- H. Hatami, B. Szegedy, 'Limits of graphs that are convergent in the colored neighborhood metric'

TEACHING AND GRADUATE STUDENT SUPERVISION

Undergraduate courses taught:

- Differential geometry MATC63 (2006 fall)
- Differential geometry MATC63H (2008 fall)
- Calculus for management II. MATA33 (2009 winter)
- Calculus for management I. MATA32 (2009 fall)
- Calculus for management I. MATA32 (2010 fall)
- enumerative combinatorics MATC44H3 (2010 winter)

Graduate courses taught:

- Analytic methods in combinatorics MAT1435HF (2006 fall)
- Group theory today MAT1101HF (2007 fall)
- Lie Algebras MAT1120 (2009 winter)
- combinatorial methods MAT1302HS (2010 winter)
- Limits of discrete structures MAT1304HF (2010 fall)

PhD students supervised:

- Hamed Hatami, 2007-2009, PhD (jointly with Michael Molloy), Title of thesis: On generalizations of Gowers norms
- Lluis Vena, 2009-, Phd (project: On the limits of graphs)

MSc students:

- Omar Antolin Camarena (2007), masters (project: Delta complexes and reflection positivity)

- Janet Xiang Li, 2010, masters (project: An analytic approach to the method of dependent random choice)

ADMINISTRATIVE POSITIONS

- I was a co-organizer of the conference: “Residually finite groups graph limits and dynamic”, Banff 13-17 April 2009
- I am a co-organizers of the conference “Limits of graphs and hypergraphs”, 2011 Aug 15-19, AIM
- I am a co-organizer of the conference “Probability Estimation”, 2011, Banff