Ferenc Szöllősi | Curriculum Vitæ

Department of Communications and Networking, Aalto University
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"Art is never finished, only abandoned." — Leonardo da Vinci

Employment

Current DEC 2014–	Postdoctoral researcher *Aalto University, Espoo, Finland* — working with Prof. Patric Östergård Research on computational design theory. I developed algorithms in C in order to generate and study equiangular lines, two-graphs, and complex Hadamard matrices.
DEC 2012– NOV 2014	JSPS Postdoctoral researcher *Tōhoku University, Sendai, Japan* — working with Prof. Akihiro Munemasa Research on algebraic combinatorics. I studied equiangular lines and equiangular tight frames, and their connections to algebraic combinatorics and algebraic graph theory.
JUL–SEP 2012	Visiting researcher *Chonbuk National University, Jeonju, Rep. Korea* — working with Prof. Moon Ho Lee Research on modular Hadamard and inverse-orthogonal (a.k.a. "Jacket") matrices.

Teaching experience

Aalto U. 2015–	Teaching Assistant of "Coding theory" course (3 semesters) Lecturer of the mini-course "Quantum error correction" (1 semester, 4 lectures)
BME 2003–2012	Teaching Assistant of various undergraduate mathematical courses, including "Calculus", "Linear algebra", "Graph theory", and "Theory of differential equations" Substitute lecturer of "The *Mathematica* Computer Algebra System" course (1 semester)

Education

JUN 2012	PhD in Mathematics *Central European University*, Budapest, Hungary Thesis: "Construction, classification, and parametrization of complex Hadamard matrices" Advisor: Prof. Máté Matolcsi
JUN 2008	MSc in Mathematics *Budapest University of Technology and Economics* (*BME*), Budapest, Hungary Thesis: "Constructions of complex Hadamard matrices" [in Hungarian] Advisor: Prof. Máté Matolcsi

Awards and Grants

2012–2014	JSPS KAKENHI grant-in-aid for scientific research no. 24·02807 *Amount*: 2.400.000JPY (about 20.000USD)
2009–2014	Hungarian National Research fund (OTKA) no. K-77748 *Amount*: 1.500.000HUF (about 5.000USD)
2012	Géza Grünwald Medal *János Bolyai Mathematical Society*, Hungary
2012	Best dissertation award *The Provost of Central European University*, Hungary

Service for the community

- Acted as a referee for: *Australas. J. Combin.*; *J. Algebraic Combin.*; *J. Combin. Des.*; *Des. Codes Cryptogr.*; *Linear Algebra Appl.*; *Spec. Matrices*; *Studia Sci. Math. Hungar.*; and *J. Symbolic Comput.*
- Co-organized the following scientific events: 5th workshop on real and complex Hadamard matrices in Budapest, Hungary (2017); and NORCOM 2016 combinatorial conference in Levi, Finland (2016).

Recent conference and seminar talks

- "Enumeration of Seidel matrices", contr. talk, Tight Frames and Approximation workshop, Taipa, 2018.
- "New complex Hadamard matrices and their applications", seminar talk, Jagiellonian U., Kraków, 2017.
- "New results on equiangular lines or 'How I caught a gold fish'", invited plenary talk, CSD8, Mons, 2017.
- "Classifying complex ETFs by computational algebraic geometry", contr. t., SIAM AG17, Atlanta, 2017.
- "Open problems on Butson Hadamard matrices", contr. talk, 5th Hadamard workshop, Budapest, 2017.

Previously in: Galway ● Traunkirchen ● Thurnau ● Pisa ● Banff ● Regina ● Winnipeg ● Athens ● Singapore ● Melbourne ● Jeonju ● Sendai ● Kyoto ● Pohang ● Boca Raton ● Hamamatsu ● Palo Alto ● Kobe ● Tokyo ● Providence ● Shijiazhuang ● Daejeon ● Lethbridge ● Tsukuba ● Espoo ● Bremen ● Fort Collins ● Edmonton ● Levi

List of publications

0. F. Szöllősi: Construction, classification, and parametrization of complex Hadamard matrices, PhD thesis, Central European University, Budapest, Hungary (2012).
1. D. Petz, K. M. Hangos, A. Szántó, F. Szöllősi: State tomography for two qubits using reduced densities, *J. Phys. A: Mathematical and General*, **39**, 10901–10907 (2006).
2. M. Matolcsi, J. Réffy, F. Szöllősi: Constructions of complex Hadamard matrices via tiling Abelian groups, *Open Syst. Inf. Dyn.*, **14:3**, 247–263 (2007).
3. F. Szöllősi: Parametrizing Complex Hadamard matrices, *European J. Combin.*, **29**, 1219–1234 (2008).
4. M. Matolcsi, F. Szöllősi: Towards a classification of 6×6 complex Hadamard matrices, *Open Syst. Inf. Dyn.*, **15:2**, 93–108 (2008).
5. S. Severini, F. Szöllősi: A further look into combinatorial orthogonality, *Electron. J. Linear Algebra*, **17**, 376–388 (2008).
6. F. Szöllősi: A two-parameter family of complex Hadamard matrices of order 6 induced by hypocycloids, *Proc. Amer. Math. Soc.*, **138**, 921–928 (2010).
7. Ph. Jaming, M. Matolcsi, P. Móra, F. Szöllősi, M. Weiner: A generalized Pauli problem and an infinite family of MUB-triplets in dimension 6, *J. Phys. A*, **42:24**, 245305, (2009).
8. D. Z. Ðoković, S. Severini, F. Szöllősi: Rational Orthogonal versus Real Orthogonal, *Electron. J. Linear Algebra*, **18**, 649–673 (2009).
9. F. Szöllősi: Exotic complex Hadamard matrices, and their equivalence, *Cryptogr. Commun.*, **2:2**, 187–198 (2010).
10. F. Szöllősi: On quaternary complex Hadamard matrices of small orders, *Adv. Math. Commun.*, **5:2**, 309–315 (2011).
11. F. Szöllősi: Complex Hadamard matrices of order 6: A four-parameter family, *J. Lond. Math. Soc. (2)*, **85:2**, 616–632 (2013).
12. F. Szöllősi: Complex Hadamard matrices and equiangular tight frames, *Linear Algebra Appl.*, **438**, 1962–1967 (2013).
13. F. Szöllősi: A note on the existence of BH(19, 6) matrices, *Australas. J. Combin.*, **55**, 31–34 (2013).
14. P.H.J. Lampio, F. Szöllősi, P.R.J. Östergård: The quaternary complex Hadamard matrices of orders 10, 12 and 14, *Discrete Math.*, **313**, 189–206 (2013).
15. M.H. Lee, F. Szöllősi: Hadamard matrices modulo 5, *J. Combin. Des.*, **22**:4, 171–178 (2014).
16. M.H. Lee, F. Szöllősi: A note on inverse-orthogonal Toeplitz matrices, *Electron. J. Linear Algebra*, **60**, 898–904 (2013).
17. G. Greaves, J.H. Koolen, A. Munemasa, F. Szöllősi: Equiangular lines in Euclidean spaces, *J. Combin. Theory Ser. A*, **138**, 208–235 (2016).
18. F. Szöllősi: The hunt for weighing matrices of small orders, in Algebraic Design Theory and Hadamard matrices, *Springer Proceedings in Mathematics & Statistic*, 223–234 (2015).
19. F. Szöllősi: A remark on a construction of D.S. Asche, *Discr. Comput. Geom.* https://doi.org/10.1007/s00454-017-9933-4 (2017).
20. F. Szöllősi, P.R.J. Östergård: Enumeration of Seidel matrices, *European J. Combin.*, **69**, 169–184 (2018).
21. F. Szöllősi: All complex equiangular tight frames in dimension 3, submitted to *J. Symbolic Comput.*, see arXiv:1402.6429 [math.FA] (2014).
22. P.H.J. Lampio, P.R.J. Östergård, F. Szöllősi: Orderly generation of Butson Hadamard matrices, submitted to *Math. Comp.*, arXiv:1707.02287v1 [math.CO] (2017).
23. F. Szöllősi, P.R.J. Östergård: Constructions of maximum few-distance sets in Euclidean spaces, *preprint*, (2018).