

T H O M A S J . B R I T Z

Curriculum Vitae

PERSONAL DATA

Nationality: Danish
Date of Birth: April 3rd, 1974
Marital Status: Married, 2 children

EDUCATION

University of Aarhus, Denmark.
M.Sc. in Mathematics, 2000.
University of Aarhus, Denmark.
Ph.D. in Mathematics, 2003.

ACADEMIC APPOINTMENTS

Massachusetts Institute of Technology, Cambridge, MA, USA (September 1998 - July 1999)
Visiting Scholar, Department of Mathematics.
Host/supervisor: Prof. Gian-Carlo Rota.

Queen Mary and Westfield College, University of London, UK (September 1999)
Host/supervisor: Prof. Peter J. Cameron, School of Mathematical Sciences.

Queen Mary and Westfield College, University of London, UK (September 2000 - January 2001)
Visiting Postgraduate Student, School of Mathematical Sciences.
Host/supervisor: Prof. Peter J. Cameron.

Queen Mary, University of London, UK (September - December 2001)
Visiting Postgraduate Student, School of Mathematical Sciences.
Host/supervisor: Prof. Peter J. Cameron.

University of Oxford, UK (December 2002)
Host: Prof. Jotun Hein, Department of Statistics.

University of Victoria, BC, Canada (January – June 2003)
Postdoctoral Fellow, Department of Mathematics and Statistics
Employers/supervisors: Prof. Dale Olesky and Prof. Pauline van den Driessche.

University of Victoria, BC, Canada (July 2003 – June 2004)
PIMS Postdoctoral Fellow, Department of Mathematics and Statistics
Financed by a PIMS Postdoctoral Fellowship grant.

Technical University of Denmark (September 2004 – August 2005)
Assistant Professor, Department of Mathematics
Financed by a Villum Kann Rasmussen postdoctoral grant.

University of New South Wales, Australia (January – December 2006)
Visiting Research Fellow, School of Mathematics
Financed by a Carlsberg Foundation postdoctoral grant.

Aichi Prefectural University and Nagoya University, Japan (June 2006)
Host: Dr. Keisuke Shiromoto, Department of Information Systems.

Victoria University, Wellington, New Zealand (October 2006)
 Host: Prof. Geoff Whittle, Department of Mathematics, Statistics and Computer Science.

University of Western Australia, WA, Australia (November 2008)
 Host: Prof. Gordon Royle, Department of Mathematics and Statistics.

University of South Australia, SA, Australia (October 2009)
 Host: Prof. Alex Grant and Dr. Terence Chan, Institute for Telecommunications Research.

University of New South Wales, Australia (January 2007 – January 2010)
 Australian Postdoctoral Fellow, School of Mathematics and Statistics
 Financed by an ARC Discovery Project grant (Chief/Sole Investigator).

University of New South Wales, Australia (January 2010 – present)
 Visiting Fellow, School of Mathematics and Statistics.

INDUSTRIAL AND COMMERCIAL CONSULTANCY

Aasted-Mikroverk, Denmark (December 2004 – August 2005).

Lene Højland Grafisk Design, Denmark (April 2007).

Qantas Airways Limited, Australia (June 2007).

Victoria Hospitals Foundation, Canada (March 2009).

SUPERVISION

Technical University of Denmark (February – August 2005)
 Co-supervisor on Masters thesis for Marie-Louise Højlund Rasmussen.

University of New South Wales (February – June 2009)
 Supervisor on Masters thesis for Doug Han Yang.

University of New South Wales (July – October 2009)
 Supervisor on Masters thesis for Ali Alkhaldi.

TEACHING

Private coach and tutor, on numerous occasions (1989 – 2003).

University of Aarhus (January 1998 – May 2002)
 Teaching assistant in Linear Algebra (Mat10, 2 terms) and
 Probability and Statistics 1 (SS1, 6 terms).

University of Victoria, BC, Canada (September – December 2003)
 Sessional lecturer (Lectured and designed course content, lectures, and midterm exams)
 in Finite Mathematics (MATH 151, approx. 120 students).

Outreach activity: PIMS Math Mania (March 2004)
 Deep Cove Elementary School, Sidney, BC, Canada.

University of New South Wales (March – June 2008)
 Sessional lecturer (lectured, and wrote half of the course notes)
 in Algebraic Methods in Number Theory (MATH3521, 28 students).

University of New South Wales (July – November 2008)
 Sessional lecturer (lectured, and edited half of the course notes)
 in Discrete Mathematics (MATH1081, approx. 100 students).

University of New South Wales (March – June 2009)
 Sessional lecturer (lectured, and wrote exams and slides)
 in Algebraic Methods in Number Theory (MATH3521, 19 students).

University of New South Wales (July – October 2009)
 Sessional lecturer (lectured, and wrote exams and slides)
 in Discrete Mathematics (MATH1081, approx. 100 students).

PUBLICATIONS

- T. Britz, M. Mainetti, and L. Pezzoli, Some operations on the family of equivalence relations, in *Algebraic Combinatorics and Computer Science. A Tribute to Gian-Carlo Rota* (eds. H. Crapo and D. Senato), pp. 445–460, Springer-Verlag, Milano, 2001.
- T. Britz and S. Fomin, Finite posets and Ferrers shapes, *Advances in Mathematics* **158** (2001), 86–127.
- T. Britz, The inverse of a non-singular free matrix, *Linear Algebra and its Applications* **338** (2001), 245–249.
- T. Britz, MacWilliams identities and matroid polynomials, *The Electronic Journal of Combinatorics* **9** (2002), Research paper R19, 17 pp.
- T. J. Britz and D. Britz, Mathematical proof of the consistency of Feldberg’s simple BDF start in electrochemical digital simulation, *Journal of Electroanalytical Chemistry* **546** (2003), 123–125.
- T. Britz, D. D. Olesky, and P. van den Driessche, Matrix inversion and digraphs: the one factor case, *Electronic Journal of Linear Algebra* **11** (2004), 115–131.
- T. Britz, D. D. Olesky, and P. van den Driessche, The Moore-Penrose inverse of matrices with an acyclic bipartite graph, *Linear Algebra and its Applications* **390** (2004), 47–60.
- T. Britz, J. J. McDonald, D. D. Olesky, and P. van den Driessche, Minimal spectrally arbitrary sign patterns, *SIAM Journal on Matrix Analysis and Applications* **26** (2004), 257–271.
- T. Britz, D. D. Olesky, and P. van den Driessche, Schur complements of matrices with acyclic bipartite graphs, *Electronic Journal of Linear Algebra* **14** (2005), 2–11.
- T. Britz and C. G. Rutherford, Covering radii are not matroid invariants, *Discrete Mathematics* **296** (2005), 117–120.
- T. Britz, Extensions of the Critical Theorem, *Discrete Mathematics* **305** (2005), 55–73.
- T. Britz, On P -weight and P -distance inequalities, *Discrete Mathematics* **306** (2006), 598–599.
- D. Britz, T. Britz, K. Shiromoto, and H. K. Sørensen, The higher weight enumerators of the doubly-even, self-dual $[48, 24, 12]$ code, *IEEE Transactions on Information Theory* **53** (2007), 2567–2571.
- T. Britz, Higher support matroids, *Discrete Mathematics* **307** (2007), 2300–2308.
- T. Britz, The Moore-Penrose inverse of a free matrix, *Electronic Journal of Linear Algebra* **16** (2007), 208–215.
- T. Britz and K. Shiromoto, Designs from subcode supports of linear codes, *Designs, Codes and Cryptography* **46** (2008), 175–189.
- T. Britz and K. Shiromoto, A MacWilliams type identity for matroids, *Discrete Mathematics* **308** (2008), 4551–4559.
- T. Britz, G. Royle, and K. Shiromoto, Designs from matroids, *SIAM Journal of Discrete Mathematics* **23** (2009), 1082–1099.

- T. Britz, Code enumerators and Tutte polynomials, submitted.
- T. Britz, B. Heiseldal, T. Johnson, D. Mayhew, and K. Shiromoto, Generalizations of Wei's Duality Theorem, submitted.
- T.C. Chan, A. Grant, and T. Britz, Properties of quasi-uniform codes, submitted.
- T. Britz, A note on vector quotients, in preparation.
- T. Britz and K. Shiromoto, On paving and copaving matroids, in preparation.
- T. Britz and B. Shader, An alternative expression for the Moore-Penrose inverse, in preparation.
- T. Britz, Shortest paths with given arc label sequences, in preparation.

REFEREEING AND REVIEWING

Referee for Advances in Applied Mathematics; Advances in Mathematics of Communications; Applicable Algebra in Engineering, Communication and Computing; Ars Combinatoria; Australasian Journal of Combinatorics; Discrete Applied Mathematics; Discrete Mathematics; Electronic Journal of Combinatorics; EURASIP Journal on Wireless Communications and Networking; Graphs and Combinatorics; Hacettepe Journal of Mathematics and Statistics; IEEE Transactions on Information Theory; Journal of Algebraic Combinatorics; Journal of Applied Mathematics and Computing; Journal of Symbolic Computation; Linear Algebra and Applications; Linear and Multilinear Algebra; Proceedings of the London Mathematical Society; SIAM Journal on Matrix Analysis and Applications; Transactions of the American Mathematical Society.

Reviewer for Mathematical Reviews (>50 article reviews, two book reviews).

ARC Grant Assessor.

SELECTED TALKS

- Delvist ordnede mængder* (Danish), Eulers Venner Gult Foredrag, University of Aarhus, Denmark, April 2001.
- More on posets*, Queen Mary Combinatorics Study Group, Queen Mary and Westfield College, London, UK, October 2001.
- Inverting a generic matrix*, The Tenth International Linear Algebra Society Conference, Challenges in Matrix Theory, Auburn, AL, USA, June 2002.
- Digressions on posets and shapes*, Department of Mathematics and Statistics Colloquium, University of Victoria, Canada, February 2003.
- Extending the Critical Theorem*, Graph Theory of Brian Alspach, Simon Fraser University, Burnaby, BC, Canada, May 2003.
- From codes to matroids*, Combinatorial Potlatch and 5th Coast Combinatorics Conference, University of Victoria, Victoria, BC, Canada, November 8–10, 2003.
- Matrix inversion and digraphs: The one factor case*, Directions in Combinatorial Matrix Theory, Banff International Research Station, Canada, May 6–8, 2004.
- From codes to matroids*, 8th Nordic Combinatorial Conference, Aalborg University, Denmark, October 20–22, 2004.
- Weight enumerators and matroid polynomials*, Queen Mary Combinatorics Study Group, Queen Mary, University of London, UK, November 2004.

- Matroids, codes and graphs. But mainly matroids*, Department of Mathematics, Technical University of Denmark, March 2005.
- Three nice dual identities*, Department of Pure Mathematics, University of New South Wales, Australia, March 2006.
- Matroids, codes, and designs*, Jimbo Laboratory, Nagoya University, with video conference feed to the Department of Mathematics, Keio University, Japan, June 2006.
- Codes, matroids, designs, and graphs. And big polynomials*, Algebra Seminar, School of Mathematics and Statistics, University of Sydney, Australia, March 2007.
- Matroids applied to coding theory*, 21st British Combinatorial Conference, University of Reading, July 9–13, 2007.
- A duality theorem for graphs, codes, and matroids* (poster), From Higman-Sims to Urysohn: a random walk through groups, graphs, designs, and spaces. Peter Cameron's 60 birthday conference, Ambleside, August 23–25, 2007.
- Matroids applied to coding theory*, Joint Meeting of the AMS–NZMS 2007, Victoria University of Wellington, New Zealand, December 12–15, 2007.
- Why it is useful to study linear algebra combinatorially*, Groups and Combinatorics Seminar, School of Mathematics and Statistics, University of Western Australia, November 2008.
- The connections between linear codes and matroids*, The Fourth International Conference on Combinatorial Mathematics and Combinatorial Computing, Auckland, New Zealand, December 2008.
- On codes and matroids*, Mathematics Colloquium, Department of Mathematics and Computer Science, University of Southern Denmark, Denmark, July 2009.
- On linear codes and matroids: an overview and update*, 22nd British Combinatorial Conference, University of St Andrews, UK, July 5–10, 2009.
- From codes to matroids and back*, Applications of Matroid Theory and Combinatorial Optimization to Information and Coding Theory, Banff International Research Station, Canada, August 2–7, 2009.
- Three combinatorial dual identities and their proximity to something useful*, AustMS 2009 Early Career Researchers Workshop, Adelaide Hills, South Australia, 27 September, 2009.