

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 – June 2010)
Visiting Fellow, School of Mathematics and Statistics.
- University of New South Wales, Australia (July 2010 –)
Lecturer, Department of Pure Mathematics, 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).
- Red Square Productions, Australia (April 2010).
- Cochlear, Australia (March – May 2010).
- MASCOS, Australia (March 2010 –).
- ANSTO, Australia (March 2010 –).

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 New South Wales (March – June 2010)
Sessional tutor in Discrete Mathematics (MATH1081) and
Algebraic Methods in Number Theory (MATH3521).

- Outreach activity: PIMS Math Mania (March 2004)
Deep Cove Elementary School, Sidney, BC, Canada.
- 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).
- 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).
- University of New South Wales (March – June 2010)
Sessional lecturer (lectured and wrote exams)
in Algebraic Methods in Number Theory (MATH3521, 36 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.C. Chan, A. Grant, and T. Britz, Properties of quasi-uniform codes, to appear in ISIT 2010 peer-reviewed proceedings.
- T. Britz, Code enumerators and Tutte polynomials, to appear in IEEE Transactions on Information Theory.
- T. Britz, T. Johnson, D. Mayhew, and K. Shiromoto, Wei-type duality theorems for matroids, 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 (> 60 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.

Matroids, codes and graphs. But mainly matroids, Department of Mathematics, Technical University of Denmark, March 2005.

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, 4th International Conference on Combinatorial Mathematics and 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, BIRS, 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.

Three combinatorial dual identities and their proximity to something useful, Mathematics Colloquium, Department of Mathematics and Computer Science, University of Southern Denmark, Denmark, May 2010.