

Centre for Mathematical Social Sciences – Report 2010

Members

- Dr Mark Wilson (Director 2011)
- A/Prof Arkadii Slinko (Seminar Organizer and Deputy Director 2011)
- A/Prof Matthew Ryan (Deputy Director 2011)
- Dr Patrick Girard (Philosophy)
- Dr Jeremy Seligman (Philosophy)
- A/Prof John Hillas (Economics)
- Dr Geoffrey Pritchard (Statistics)
- Dr Tan Lee (Accounting and Finance)
- Dr Simona Fabrizi (Massey University, Albany)
- Dr Steffen Lippert (Massey University, Albany)

PhD students

- Reyhaneh Reyhani (Computer Science)
- Tatyana Gvozdeva (Mathematics)
- Ali Hameed (Mathematics)
- Harshal Chitale (Economics)

External Affiliates

- Professor Chih Chang (NTHU, Taiwan)
- Dr Edith Elkind (Nanyang Tech, Singapore)
- Professor Mike Fellows (University of Newcastle, Australia)
- Professor Mamoru Kaneko (University of Tsukuba, Japan)
- Professor Flavio Menezes (University of Queensland, Australia)
- Professor Dr Clemens Puppe (KIT Karlsruhe, Germany)
- Dr Dmitriy Kvasov (University of Adelaide, Australia)

Advisory Board

- Prof. James Sneyd (HOD, Mathematics, Auckland) – CHAIR
- Prof. Walter Bossert (Economics, Montreal)
- Prof. Steven Brams (Political Science, NYU)
- Prof. Andy McLennan (Economics, UQ)
- Prof. Hervé Moulin (Economics, Rice)
- Prof. Dr Jörg Rothe (Mathematics/Computer Science, Dusseldorf)
- Prof. Toby Walsh (Computer Science, UNSW)
- Prof. Bill Zwicker (Mathematics, Union College)

Activities

The CMSS was formally established in February 2010. Its mission statement: The Centre for Mathematical Social Sciences is a group of researchers interested in applying mathematical and computational modelling to social sciences (particularly politics and economics), based at the University of Auckland. The central topic is mathematics of collective decisions made by a group of self-motivated agents.

The Centre's main activities have been: two international workshops held at UoA; hosting of international visitors; research seminar. Detailed information about all of these is available from the CMSS website, cmss.auckland.ac.nz.

The first workshop was held in February 2010 and entitled *Algorithmic Aspects of Game Theory and Social Choice*. It included 14 talks, with 17 participants from Australia, Germany and Singapore in addition to UoA.

The second workshop was held in December 2010. It attracted 21 attendees and included 16 talks including presentations by the following invited speakers: Clemens Puppe (KIT, Karlsruhe), Bill Zwicker (Union College, New York), Toby Walsh (University of NSW and NICTA), Igor Shparlinski (Macquarie University, Sydney).

There were 10 talks given in the official CMSS seminar. In addition to talks by locals, there were talks by short-term visitors Piotr Faliszewski (AGH Krakow), Suren Basov (La Trobe University), Motty Perry (Hebrew University of Jerusalem and University of Warwick) and Yuelan Chen (University of Queensland).

Financial report

The first four members listed above were successful in an application to the Cross-Faculty Research Fund, and were awarded \$18200. After expenditure on the December workshop, there currently remains \$8511 in that grant, which is the total money available to CMSS. Money was used to support travel and accommodation of international invited speakers to the workshop, and for some meals for participants. The February workshop was funded by small grants totalling \$7000 from NZIMA (through the Algorithmics thematic programme), Departments of Mathematics and Computer Science, all of which were fully spent as above.

Publications

The CMSS does not have a separate research report series. Members publish in international conference proceedings and journals. A (probably incomplete) list of such publications follows.

A. Slinko and S. White. *On the manipulability of proportional representation*, Journal of Theoretical Politics, 2010, 22(3): 1-32.

E. Elkind, P. Faliszewski, and A. Slinko. *On the role of distances in defining voting rules*. Wiebe van der Hoek, Gal A. Kaminka, Yves Lesperance, Michael Luck, and Sandip Sen, eds. AAMAS 2010: Proceedings of the Ninth International Conference on Autonomous Agents and Multi-Agent Systems. IFAAMAS: International Foundation for Autonomous Agents and Multiagent Systems, Toronto, Canada, May 10-14, pp. 375-382. 2010.

E. Elkind, P. Faliszewski, and A. Slinko. *Cloning in Elections*. The Twenty-Fourth Conference on Artificial Intelligence (AAAI-10), Maria Fox and David Poole(eds.), Proceedings of the Twenty-

Fourth AAI Conference on Artificial Intelligence, Atlanta, Georgia, USA, 11-15 July, 2010, p.768-773.

E. Elkind, P. Faliszewski, and A. Slinko. *Good Rationalizations of Voting Rules*. Twenty-Fourth Conference on Artificial Intelligence (AAAI-10), Maria Fox and David Poole(eds.), Proceedings of the Twenty-Fourth AAI Conference on Artificial Intelligence, Atlanta, Georgia, 11-15 July, 2010, p.774-779.

T. Gvozdeva, L. A. Hemaspaandra and A. Slinko. *Three Hierarchies of Simple Games Parameterized by "Resource" Parameters*. Proceedings of the Third International Workshop on Computational Social Choice (COMSOC-2010). Eds. V. Conitzer and Joerg Rothe. Dusseldorf, Germany, 13-16 September, 2010, p. 259-270.

E. Elkind, P. Faliszewski, and A. Slinko. *Cloning in Elections*. Proceedings of the Third International Workshop on Computational Social Choice (COMSOC-2010). Eds. V. Conitzer and Joerg Rothe. Dusseldorf, Germany, 13--16 September, 2010, p. 175-186.

E. Elkind, P. Faliszewski and A. Slinko. *Distance Rationalization of Voting Rules*. Proceedings of the Third International Workshop on Computational Social Choice (COMSOC-2010). Eds. V. Conitzer and Joerg Rothe. Dusseldorf, Germany, 13-16 September, 2010, p. 379-390.

R. Pemantle and MC Wilson. *Asymptotic expansions of oscillatory integrals with complex phase*. AMS Special Sessions on Algorithmic Probability and Combinatorics, DePaul University; University of British Columbia. Editors: Lladser M, Maier R, Mishna M, Rechnitzer A. American Mathematical Society. 520: 221-240. 2010

MC Wilson. *An interesting new Mahonian permutation statistic*. Electronic Journal of Combinatorics **17**(1) Article number R147, 2010

MC Wilson and R Reyhani. *The probability of safe manipulation*. Proceedings of the Third International Workshop on Computational Social Choice (COMSOC-2010). Eds. V. Conitzer and Joerg Rothe. Dusseldorf, Germany, 13-16 September, 2010, p. 423-430.

M. Ryan. *Mixture Sets on Finite Domains*. Decisions in Economics and Finance 33(2) (2010): 139-147.

G. Pritchard, G. Zakeri, and A. Philpott. *A single-settlement, energy-only electric power market for unpredictable and intermittent participants*. Operations Research 58 (2010) 1210—1219.

W. L. Sweatman, G. Pritchard, W. Whiten, M. Camden, and K. Nan. *Optimising for wind power contributions in an electricity grid*. Progress in Industrial Mathematics at ECMI 2008; Mathematics in Industry 15 (2010) 1039—1045.

LEE, T. and JOU, J. *Urban spatial development: a real options approach*. Journal of Real Estate Finance and Economics, 40(2), 161-187.

Future plans

Key plans for 2011-2012 are: establish the CMSS summer workshop as an annual event (which involves securing more funding); investigate formal affiliations with other such centres and research groups worldwide; improve publicity and profile of CMSS locally and internationally; explore joint supervision by members, and joint teaching of postgraduate courses.