

List of publications

R. J. Gibbens

13 October 2010

Papers in journals

All of the papers in this section have been peer-reviewed.

- [1] R. J. Gibbens and F. P. Kelly. Dynamic routing in fully connected networks. *IMA Journal of Mathematical Control & Information*, 7:77–111, 1990.
- [2] R. J. Gibbens and P. J. Hunt. Effective bandwidths for the multi-type UAS channel. *Queueing Systems*, 9:17–28, 1991.
- [3] Debasis Mitra and Richard J. Gibbens. State-dependent routing on symmetric loss networks with trunk reservations, II: Analysis and asymptotics. *Annals of Operations Research*, 35:3–30, 1992. Special Issue on Stochastic Modelling of Telecommunication Systems.
- [4] Debasis Mitra, Richard J. Gibbens, and Baosheng D. Huang. State-dependent routing on symmetric loss networks with trunk reservations, I. *IEEE Transactions on Communications*, 41(2):400–411, February 1993.
- [5] Richard J. Gibbens, Frank P. Kelly, and Stephen R. E. Turner. Dynamic routing in multi-parented networks. *IEEE/ACM Transactions on Networking*, 1(2):261–270, April 1993.
- [6] N. G. Bean, R. J. Gibbens, and S. Zachary. Asymptotic analysis of single resource loss systems in heavy traffic with applications to integrated networks. *Advances in Applied Probability*, 27:273–292, March 1995.
- [7] R. J. Gibbens, F. P. Kelly, and P. B. Key. A decision-theoretic approach to call admission control in ATM networks. *IEEE Journal on Selected Areas in Communications, invited paper for special issue on Advances in the Fundamentals of Networking*, 13(6):1101–1114, 1995.
- [8] R. J. Gibbens and F. P. Kelly. Network programming methods for loss networks. *IEEE Journal on Selected Areas in Communications, invited paper for special issue on Advances in the Fundamentals of Networking*, 13(7):1189–1198, 1995.
- [9] N. G. Bean, R. J. Gibbens, and S. Zachary. Dynamic and equilibrium behaviour of controlled loss networks. *Annals of Applied Probability*, 7(4):873–885, 1997.
- [10] R. J. Gibbens and F. P. Kelly. Resource pricing and the evolution of congestion control. *Automatica*, 35:1969–1985, 1999.
- [11] S. Baroni, P. Bayvel, R. J. Gibbens, and S. K. Korotky. Analysis and design of resilient multi-fibre wavelength-routed optical transport networks. *IEEE Journal of Lightwave Technology*, 17(5):743–758, 1999.
- [12] R. J. Gibbens. Control and pricing for communication networks. *Philosophical Transactions Royal Society London A*, 358:331–341, 2000.

- [13] R. J. Gibbens, S. K. Sargood, F. P. Kelly, H. Azmoodeh, R. Macfadyen, and N. Macfadyen. An Approach to Service Level Agreements for IP networks with Differentiated Services. *Philosophical Transactions Royal Society London A*, 358(1773):2165–2182, August 2000. Royal Society discussion meeting on Network Modelling in the 21st Century, 6–7 December 1999.
- [14] R. J. Gibbens, R. Mason, and R. Steinberg. Internet service classes under competition. *IEEE Journal on Selected Areas in Communications, special issue on Quality of Service in the Internet*, 18(12):2490–2498, December 2000.
- [15] Richard Gibbens and Peter Key. Distributed control and resource marking using best-effort routers. *IEEE Network, special issue on the control of best effort traffic*, 15(3):54–59, May 2001.
- [16] R. J. Gibbens and F. P. Kelly. On packet marking at priority queues. *IEEE Transactions on Automatic Control*, 47:1016–1020, 2002.
- [17] J. Crowcroft, R. J. Gibbens, F. P. Kelly, and S. Östring. Modelling incentives for collaboration in mobile ad-hoc networks. *Performance Evaluation*, 54:427–439, 2004.
- [18] Richard J. Gibbens and Yunus Saatci. Data, modelling and inference in road traffic networks. *Philosophical Transactions of the Royal Society London A*, 366(1872):1907–1919, 2008. Royal Society discussion meeting on Networks: modelling and control, 24–25 September 2007.

Papers in preparation or under review

- [1] Chi-Kin Chau, Richard J. Gibbens, Robert E. Hancock, and Don Towsley. Enabling robust multipath routing in wireless networks. Submitted for publication.
- [2] Saikat Guha, Prithwish Basu, Chi-Kin Chau, and Richard Gibbens. Green wave sleep scheduling: latency versus throughput for duty cycling wireless networks. Submitted for publication.
- [3] Fernando M. V. Ramos, Jon Crowcroft, Richard J. Gibbens, Pablo Rodriguez, and Ian H. White. Channel smurfing: Minimising channel switching delay in IPTV distribution networks. Invited paper in preparation for IPTV special issue for the International Journal of Signal Processing: Image Communication (Elsevier).

Papers in conference proceedings

The papers in this section that have been peer-reviewed are [1, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23].

- [1] R. J. Gibbens, F. P. Kelly, and P. B. Key. Dynamic alternative routing — modelling and behaviour. In *Twelfth International Teletraffic Congress*, pages 3.4A3.1 – 3.4A3.7. North-Holland, 1988. Turin.
- [2] R. J. Gibbens and P. A. Whiting. An investigation of the accuracy of implied cost methods for circuit-switched network optimization. In *Fifth UK Teletraffic Symposium*, 1988. 7 pages.
- [3] R. J. Gibbens and S. R. E. Turner. Sticky random routing in dual-parented networks. In *Eighth UK Teletraffic Symposium*, pages 6/1 – 6/5, IEE, Savoy Place, London, WC2R OBL, UK, April 1991. The Institution of Electrical Engineers.
- [4] R. J. Gibbens, F. P. Kelly, G. A. Cope, and M. J. Whitehead. Coalitions in the international network. In Arne Jensen and V. B. Iversen, editors, *Teletraffic and Datatraffic in a Period of Change, Thirteenth International Teletraffic Congress*, pages 93–98. Elsevier Science Publishers B. V. (North-Holland), 1991. Copenhagen.
- [5] Debasis Mitra, Richard J. Gibbens, and B. D. Huang. Analysis and optimal design of the Aggregated-Least-Busy-Alternative routing strategy on symmetric loss networks with trunk reservations. In Arne Jensen and V. B. Iversen, editors, *Teletraffic and Datatraffic in a Period of Change, Thirteenth International Teletraffic Congress*, pages 477–482. Elsevier Science Publishers B. V. (North-Holland), 1991. Copenhagen.
- [6] R. J. Gibbens and P. Reichl. A general performance bound applied to examples of highly connected loss networks. In *Tenth UK Teletraffic Symposium*, pages 3/1 – 3/11, IEE, Savoy Place, London, WC2 OBL, UK, April 1993. The Institution of Electrical Engineers.
- [7] N. G. Bean, R. J. Gibbens, and S. Zachary. The performance of single resource loss systems in multiservice networks. In Jacques Labetoulle and James W. Roberts, editors, *The Fundamental Role of Teletraffic in the Evolution of Telecommunications Networks, Proceedings of the 14th International Teletraffic Congress — ITC 14*, volume 1a of *Teletraffic Science and Engineering*, pages 13–21. Elsevier Science B.V., June 1994. Antibes Juan-les-Pins.
- [8] R. J. Gibbens and F. P. Kelly. Measurement-based connection admission control. In V. Ramaswami and P. E. Wirth, editors, *Proceedings of the 15th International Teletraffic Congress — ITC 15*, *Teletraffic Science and Engineering*, pages 879–888. Elsevier Science B.V., 1997.
- [9] S. Baroni, P. Bayvel, and R. J. Gibbens. Restoration capacity for resilient wavelength-routed optical networks. In *Proceedings of IEEE/LEOS Summer Topical Meeting on 'Broadband Optical Networks and Technologies: an Emerging Reality'*, pages 31–32, July 1998. Monterey, CA.

- [10] S. Baroni, P. Bayvel, and R. J. Gibbens. On the number of wavelengths in arbitrarily-connected wavelength-routed optical networks. In R. A. Barry, editor, *Optical Society of America (OSA) Trends in Optics and Photonics Series (TOPS)*, volume 20, pages 195–204, 1998.
- [11] R. J. Gibbens and F. P. Kelly. Distributed congestion acceptance control for a connectionless network. In P. B. Key and D. G. Smith, editors, *Proceedings of the 16th International Teletraffic Congress — ITC 16*, Teletraffic Science and Engineering, pages 941–952. Elsevier Science B.V., 1999.
- [12] R. J. Gibbens and Y.-C. Teh. Critical time and space scales for statistical multiplexing in multiservice networks. In P. B. Key and D. G. Smith, editors, *Proceedings of the 16th International Teletraffic Congress — ITC 16*, Teletraffic Science and Engineering, pages 87–96. Elsevier Science B.V., 1999.
- [13] R. J. Gibbens and P. B. Key. The use of games to assess user strategies for differential Quality of Service in the Internet. In *Proceedings of Workshop on Internet Service Quality Economics*. MIT, December 1999. 17 pages.
- [14] R. J. Gibbens, S. K. Sargood, C. Van Eijl, F. P. Kelly, H. Azmoodeh, R. Macfadyen, and N. Macfadyen. Fixed Point Models for the End-to-End Performance Analysis of IP Networks. In *Proceedings of 13th ITC Specialist Seminar: IP Traffic Measurement, Modeling and Management*, pages 10/1–10/8, September 2000. Monterey, CA.
- [15] R. J. Gibbens, P. B. Key, and S. R. E. Turner. Properties of the virtual queue marking algorithm. In *Proceedings of 17th UK Teletraffic Symposium*. IEE publications, May 2001. 6 pages.
- [16] C.-K. Chau, R. J. Gibbens, and T. G. Griffin. Towards a unified theory of policy-based routing. In *Proceedings of IEEE INFOCOM 2006*, pages 1–12, April 2006.
- [17] R. J. Gibbens. Modelling multi-path problems. In *Proceedings of 42nd Annual Conference CISS 2008, Information Sciences and Systems*, pages 42–45, 2008. Princeton, NJ.
- [18] R. J. Gibbens and P. B. Key. Coalition games and resource allocation in ad-hoc networks. In *Proceedings of BioWire 2007*, volume 5151 of *Lecture Notes in Computer Science*, pages 375–386. Springer, 2008. Cambridge, UK.
- [19] R.J. Gibbens and F.P. Kelly. An investigation of proportionally fair ramp metering. In *Proceedings of 5th IMA Conference on Mathematics in Transport*, April 2010. UCL, London.
- [20] Fernando M. V. Ramos, Jon Crowcroft, Richard J. Gibbens, Pablo Rodriguez, and Ian H. White. Channel smurfing: Minimising channel switching delay in IPTV distribution networks. In *Proceedings of 2nd International Workshop on IPTV Technologies and Multi-disciplinary Applications (IWITMA), IEEE International Conference on Multimedia and Expo (ICME)*, pages 1327–1332, July 2010. Singapore, (Best paper award).
- [21] Fernando M.V. Ramos, Richard J. Gibbens, Fei Song, Pablo Rodriguez, Jon Crowcroft, and Ian H. White. Reducing energy consumption in IPTV networks by selectively pre-joining of channels. In *ACM SIGCOMM Workshop on Green Networking*, August 2010. New Delia, India.

- [22] Chi-Kin Chau, Richard Gibbens, Robert Hancock, and Don Towsley. Robustness of multipath routing in 2-D lattice networks. In *Proceedings of Annual Conference of ITA (ACITA)*, September 2010. Imperial College, London.
- [23] Andrei Bejan, Richard Gibbens, David Evans, Alastair Beresford, Jean Bacon, and Adrian Friday. Statistical modelling and analysis of sparse bus probe data in urban areas. In *Proceedings of 13th IEEE Conference on Intelligent Transportation Systems*, pages 1256–1263, September 2010. Madeira Island, Portugal.

Other papers and chapters in books

The papers that have been peer-reviewed in this section are [4, 7, 10, 16, 19, 22].

- [1] R. J. Gibbens. *Royal Statistical Society, Series B*, 47(3):420, 1985. Contribution to discussion.
- [2] R. J. Gibbens. Some aspects of dynamic routing in circuit-switched telecommunication networks. Rayleigh Prize Essay, University of Cambridge, 1986. 54 pages.
- [3] R. J. Gibbens. *Dynamic Routing in Circuit-Switched Networks: The Dynamic Alternative Routing Strategy*. PhD thesis, University of Cambridge, July 1988. 133 pages.
- [4] R.J. Gibbens, P. J. Hunt, and F. P. Kelly. Bistability in communication networks. In G. R. Grimmett and D. J. A. Welsh, editors, *Disorder in Physical Systems*, pages 113–128. Oxford University Press, 1990.
- [5] R. J. Gibbens and F. P. Kelly. ATM connection acceptance control, stage 2. Technical report, January 1991. 59 pages.
- [6] R. J. Gibbens. Teletraffic theory. In Fraidoon Mazda, editor, *Telecommunications Engineer's Reference Book*, pages 5/1 – 5/14. Butterworth-Heinemann Ltd, 1993.
- [7] R. J. Gibbens and P. Reichl. Performance bounds applied to loss networks. In D. M. Titterton, editor, *Complex Stochastic Systems and Engineering*, pages 267–279. The Institute of Mathematics and its Applications, Oxford University Press, 1995.
- [8] R. J. Gibbens, F. P. Kelly, and P. B. Key. Dynamic alternative routing. In Martha Steenstrup, editor, *Routing in Communication Networks*, pages 13–47. Manning Publications and Prentice Hall, 1995.
- [9] R. J. Gibbens. *Analytical techniques in telecommunications*, chapter Teletraffic Theory, pages 197–226. Focal Press, 1996.
- [10] R. J. Gibbens. Traffic characterisation and effective bandwidths for broadband network traces. In F. P. Kelly, S. Zachary, and I. B. Ziedins, editors, *Stochastic Networks: Theory and Applications*, Royal Statistical Society Lecture Note Series 4, pages 169–179. Oxford University Press, 1996.
- [11] R. J. Gibbens and S. R. E. Turner. Call routing in telephone networks. In *Plus Online Magazine*, number 2. Mathematics Millennium Project, May 1997. <http://pass.maths.org.uk/issue2/dar/index.html>.
- [12] R. J. Gibbens. *Royal Statistical Society, Series B*, 61(4):776–777, 1999. Vote of thanks and contribution to discussion.
- [13] R. J. Gibbens, P. Bayvel, and J. E. Midwinter. Introductory remarks. *Philosophical Transactions Royal Society London A*, 358(1773):2161–2163, August 2000. Royal Society discussion meeting on Network Modelling in the 21st Century, 6–7 December 1999.

- [14] R. J. Gibbens, P. Bayvel, and J. E. Midwinter (editors). Network modelling in the 21st century. *Philosophical Transactions Royal Society London A*, 358(1773):2159–2348, August 2000. Royal Society discussion meeting, 6–7 December 1999.
- [15] R. J. Gibbens and P. B. Key. Distributed control and resource pricing. Tutorial presentation, ACM SIGCOMM 2000 available at <http://www.research.microsoft.com/users/pbk/GKSig2kResPriceTutorial.htm>. 180 slides, September 2000.
- [16] Richard Gibbens. *Visions of the future: Physics and Electronics*, chapter Control and pricing of the Internet, pages 183–195. Cambridge University Press, 2001.
- [17] R. J. Gibbens and R. Steinberg. Practical issues on large scale combinatorial auction design. Dagstuhl workshop on Electronic Market Design, 10 pages, June 2002.
- [18] Josep Solé-Pareta, Michael Smirnov, Piet Van Mieghem, Jordi Domingo-Pascual, Edmundo Monteiro, Peter Reichl, Burkhard Stiller, and Richard J. Gibbens, editors. *Quality of Service in the Emerging Networking Panorama: Fourth International Workshop on Internet Charging and QoS Technology, ICQT 2004, Barcelona, Catalonia, Spain, September 29 - October 1, 2004, Proceedings*, volume 3266 of *Lecture Notes in Computer Science*. Springer, 2004. 390 pages.
- [19] Richard Gibbens and Wiebke Werft. Data gold mining. *Significance*, 2(3):102–105, September 2005. The Royal Statistical Society.
- [20] R. J. Gibbens and Y. Saacti. Road traffic analysis using MIDAS data: journey time prediction. Technical Report UCAM-CL-TR-676, University of Cambridge, Computer Laboratory, December 2006. 35 pages.
- [21] Fernando M.V. Ramos, Fei Song, Pablo Rodriguez, Richard Gibbens, Jon Crowcroft, and Ian H. White. Constructing an IPTV workload model. ACM SIGCOMM poster, 2009.
- [22] David Evans, Jean Bacon, Alastair R. Beresford, Richard Gibbens, and David Ingrams. Time for change. *Intertraffic World Annual Showcase*, pages 52–56, 2010.

Patents

- [1] R. J. Gibbens and F. P. Kelly. Telecommunications network and method. British patent application No 8531138. 18 December 1985.
- [2] R. J. Gibbens, T. R. Griffiths, F. P. Kelly, and P. B. Key. A communications network control method. British patent application No 94302619.5. 13 April 1994.