Rade Stanojević

CONTACT INFORMATION

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EDUCATION

National University of Ireland, Maynooth, Ireland. PhD. **May 2004 - Nov 2007.**

University of Niš, Serbia. BS, Mathematics, **Sep. 1999 - July, 2003.**

ACADEMIC EXPERIENCE

Telefonica Research, Barcelona, Spain
Postdoctoral researcher **April 2009 - present**

Hamilton Institute, NUI Maynooth, Ireland
Research Assistant/Associate **May 2004 - March 2009**

Department of Electrical Engineering, NUI Maynooth, Ireland
Temporary lecturer **Sep 2008 - Feb 2009**
Taught a course on *Probability and statistics for engineers* 12 weeks × (3h lectures + 1h tutorials).

Faculty of Science, University of Niš, Serbia
Teaching Assistant **September 2003 - April 2004**
Tutorials on: Combinatorial Optimization, Mathematical Programming, Discrete Mathematics.

HONORS AND AWARDS

Best Paper Award, IEEE IWQoS 2009.

Kenneth C. Sevcik Outstanding Student Paper Award, ACM SIGMETRICS 2008.

International Mathematical Competition: Second Prize 2000 and 2001, First Prize 2003.

International Mathematical Olympiad: Bronze Medal 1997 and 1999.

PUBLICATIONS

[15] R. Stanojević, and R. Shorten, "Distributed dynamic speed scaling". In Proceedings of IEEE INFOCOM 2010 (short paper), San Diego, CA, USA.

[14] R. Stanojević, and R. Shorten, "Trading link utilization for queueing delays: an adaptive approach". Pending minor revision in Computer Communications 2009.

[13] F. Knorn, R. Stanojević, M. Corless and R. Shorten, "A framework for decentralised feedback connectivity control with application to sensor networks". International Journal of Control, vol. 82(11), 2009.

[13a] F. Knorn, R. Stanojević, M. Corless and R. Shorten. "A problem in positive systems stability arising in topology control". In Proceedings of POSTA 2009, Valencia, Spain.

[12] L. Budzisz, R. Stanojević, R. Shorten, and F. Baker, "A strategy for fair coexistence of loss and delay-based congestion control algorithms". IEEE Communications Letters, vol. 13(7), 2009.

[12a] L. Budzisz, R. Stanojević, R. Shorten and F. Baker, "On the fair coexistence of loss- and delay-based TCP". In Proceedings of IEEE IWQoS 2009, Charleston, SC, USA.

[11] R. Stanojević and R. Shorten, "Generalized distributed rate limiting". In Proceedings of IEEE IWQoS 2009, Charleston, SC, USA. **Best Paper Award**.

[10] R. Stanojević and R. Shorten, "Load balancing vs. distributed rate limiting: an unifying framework for cloud control". In Proceedings of IEEE ICC 2009, Dresden, Germany.

[9] R. Stanojević and R. Shorten, "Fully decentralized emulation of best-effort and processor sharing queues". In Proceedings of ACM SIGMETRICS 2008, Annapolis, MD, USA. **Kenneth C. Sevcik Outstanding Student Paper Award**.

[8] R. Stanojević and R. Shorten, "Drop counters are enough". In Proceedings of IEEE IWQoS 2007, Chicago, IL, USA.

[7] R. Stanojević and R. Shorten, "How expensive is link utilization?". In Proceedings NET-COOP

2007, Avignon, France, Springer LNCS, vol. 4465.

[6] R. Stanojević and R. Shorten, "Beyond CHOKe: Stateless fair queueing". In Proceedings NETCOOP 2007, Avignon, France, Springer LNCS, vol. 4465.

[5] R. Stanojević, "Small active counters". In Proceedings of IEEE INFOCOM 2007, Anchorage, AL, USA.

[4] G. Vu-Brugier, R. Stanojević, D. Leith, and R. Shorten, "A critique of recently proposed Buffer-Sizing strategies". ACM Computer Communications Review, vol. 37(1), January 2007.

[3] R. Stanojević, R. Shorten, and C. Kellet, "Adaptive tuning of Drop-Tail buffers for reducing queueing delays". IEEE Communications Letters, vol. 10(7), 2006.

[2] A. Leizarowitz, R. Stanojević, and R. Shorten, "Tools for the analysis and design of communication networks with Markovian dynamics". Proceedings of IEE, Control Theory and Applications, vol. 153(5), 2006.

[1] F. Wirth, R. Stanojević, R. Shorten, and D. Leith, "Stochastic equilibria of AIMD communication networks". SIAM Journal on Matrix Analysis and Applications, vol. 28(3), 2006.

Research Experience

Project 5. Delay tolerant bulk transfers. April 2009 – present. Currently we investigate how to utilize the prevalent pricing model in the internet, so called 95-th percentile pricing, to move large amounts of data across the Internet for free.

Project 4. Distributed cloud control. July 2007 – present. Control of large distributed cloud-based services is a challenging problem. We treat this problem through a rigorous mathematical framework and design a solution with predictable and stable performance yet low overhead. The concept of *distributed rate limiting* (DRL) was analyzed in the papers [9] and [11]. The duality of DRL and load balancing has been a topic of investigation in [10].

Project 3. Building better (faster, more accurate, etc.) traffic measurement algorithms. May 2006 – May 2008. Our goal is to develop general techniques that make high speed traffic measurement algorithms more efficient. The main result, presented in [5], proposes a randomized hybrid SRAM/DRAM architecture of statistics-counters using which counters can be accessed on a per-packet basis, even at line speeds of *40Gbps*. This feature is essential for a number of state-of-the-art traffic measurement algorithms as well as any other application that requires statistics-counter values on a per-packet basis (e.g. flow control, packet schedulers, *Snort*, etc.).

Project 2. Small router buffers: static versus dynamic solutions. Nov 2005 – Nov 2008. A number of models have recently been proposed to capture the queueing delay/utilization tradeoff for Internet traffic. However, the lack of realistic assumptions in these models, and the extreme complexity of the estimation of model parameters, reduce their applicability in real Internet links, see [4]. We propose an adaptive approach to the problem of buffer sizing that regulates the available queue space at the optimal level ("optimal" can be defined in a very general context), see [3] and [7].

Project 1. Modelling the interaction of TCP flows under non iid. losses. May 2004 – May 2006. The starting point was the random matrix model of TCP resource allocation which possesses an attractive feature: it incorporates and manipulates the information on (partial) synchronization of losses. The structure of the model allowed us to use the rich theory of Markov chains and the results are presented in [1] and [2]. As a spinoff of this work, two memory efficient schemes have been developed for QoS scheduling: Multi-Level Comparisons [6] and Markov Active Yield [8].

Internships

Cisco Tech Center, San Jose, CA, USA. **December 2007 - March 2008**

Technion, Haifa, Israel, Host: Arie Leizarowitz. **October, 2004 - November, 2004**

Weizmann Institute of Science, Israel
Karyn Kupcinet International Science School **June, 2002 - September, 2002**

Professional Service

Reviewer for several journals and conferences including: IEEE/ACM Transactions on Networking, IEEE Transactions on Parallel and Distributed Systems, IEEE Communications Letters, Computer Communications, IEEE INFOCOM, IEEE IPDPS, IEEE ICC, IEEE Globecom.