Rade Stanojević

Contact Information

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Research Interests

Design of efficient algorithms arising in the area of computer networking.

Education

National University of Ireland, Maynooth, Ireland
Ph.D. Candidate, May 2004 - November 2007

University of Niš, Serbia
B.S., Mathematics, September 1999 - July, 2003.

Academic Experience

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

Faculty of Science, University of Niš, Serbia
Teaching Assistant **September, 2003 - April, 2004**
Weekly lab exercises for CS students: Combinatorial Optimization, Mathematical Programming, Discrete Mathematics.

Publications

[9] R. Stanojević and R. Shorten, "Fully decentralized emulation of best-effort and processor sharing queues". In Proceedings of ACM SIGMETRICS 2008 (to appear).

[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 NET-COOP 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), July, 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), pp. 506-519, 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), pp. 703-723, 2006.

Honors and Awards

International Mathematical Olympiad (for high school students) Bronze Medal 1997 (Argentina), 1999 (Romania).

International Mathematical Competition (for undergraduate students) Second Prize 2000 (UK), 2001 (Czech Rep); First Prize 2003 (Romania).

Research Experience

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 initial results are reported in [9].

Project 3. Building better (faster, more accurate, etc.) traffic measurement algorithms. May 2006 – present. Our goal is to develop general techniques that make high speed traffic measurement algorithms more efficient. The first 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 – May 2007. 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. Modeling 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 spinoffs 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**