# Selected Papers on Wireless and Mobility from IEEE INFOCOM

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FOLLOWING the long-standing tradition of IEEE INFOCOM, a small number of high-quality papers were selected from a total of 251 accepted papers chosen from the more than 1,400 submissions to the IEEE INFOCOM 2006 conference and those papers were recommended for "fast-track" publication in several prestigious IEEE transactions journals. These papers were presented at our three-day conference of 63 sessions in seven concurrent tracks, of which mobility was addressed in nearly a quarter of the sessions, as well as in a panel and a plenary invited presentation by Charles Perkins of Nokia. Among these papers, three were recommended for this special section based on their focus on mobility, originality, potential significance, and depth of contributions. These papers were augmented by the authors and subjected to an additional full review cycle, which included the original conference reviewers and an extra external reviewer. The result is a trio of papers that represent the high quality of research in mobile computing presented in Barcelona last spring.

The first paper, "A Cross-Layer Framework for Exploiting Virtual MISO Links in Mobile Ad Hoc Networks" by G. Jakllari, S.V. Krishnamurthy, M. Faloutsos, P.V. Krishnamurthy, and O. Ercetin, presents a novel multilayer approach for exploiting cooperative diversity using virtual MISO links to facilitate spatio-temporal communications without actually requiring the deployment of physical antenna arrays. The proposed approach spans the physical, medium access control, and routing layers to provide a significant improvement in end-to-end performance in terms of throughput and delay, as well as robustness to mobility and interference-induced link failures. Through extensive simulations, the authors show that, when compared to using only SISO links, the proposed approach can achieve an increase of up to 150 percent in terms of the end-to-end throughput and a decrease of up to 75 percent in the incurred end-to-end delay. Their results also demonstrate a reduction in the route discovery attempts due to link failures by up to 60 percent, a direct consequence of the robustness afforded by the approach.

The second paper, "Scheduling Efficiency of Distributed Greedy Scheduling Algorithms in Wireless Networks" by X. Wu, R. Srikant, and J.R. Perkins, considers the problem of distributed scheduling in wireless networks subject to simple collision constraints. The authors define the efficiency of a distributed scheduling algorithm to be the largest number (fraction) such that the throughput under the distributed scheduling policy is at least equal to the efficiency multiplied by the maximum throughput achievable under a centralized policy. The authors establish a lower bound on the efficiency of a distributed scheduling algorithm under a general interference model and prove that the lower bound is tight. The authors then extend these results to a more general multihop traffic scenario and show that similar scheduling efficiency results can be established by introducing prioritization or regulators to the basic greedy scheduling algorithm.

The third paper, "Impact of Human Mobility on the Design of Opportunistic Forwarding Algorithms" by A. Chaintreau, P. Hui, J. Crowcroft, C. Diot, R. Gass, and J. Scott, studies the transfer opportunities between wireless devices carried by humans. The authors conducted a series of experiments by recruiting human subjects to carry a specially designed wireless device called the Intel iMote—several of these experiments were in fact conducted at the INFOCOM conference venues. Using the empirical data sets obtained by these experiments, the authors observe that the distribution of the intercontact time, namely, the time lapse separating two contacts of the same pair of devices, exhibits a heavy tail, such as one of a power law, over a large range of values. This observation is at odds with the exponential decay implied by most mobility models. The authors then study how this new characteristic of human mobility impacts a class of previously proposed forwarding algorithms and make recommendations for the design of well-founded opportunistic forwarding algorithms in the context of human-carried devices.

These three papers provide a small sample of a large number of high-quality papers accepted for the IEEE INFOCOM 2006 conference that address a variety of challenging and important issues in wireless networks and mobile computing. As the cochairs of the conference, we would like to encourage the readers to peruse the *Proceedings of IEEE INFOCOM 2006* for more papers of interest to you. Last but not least, we would also like to take this opportunity to thank the reviewers for their timely and thoughtful reviews.

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**Arturo Azcorra** received the MSc degree in telecommunications from the Technical University of Madrid, Spain, in 1986 and the PhD degree from the same university in 1989. In 1993, he receiveded the MBA degree from the Instituto de Empresa, Madrid. He was a lecturer at the Technical University of Madrid from 1987 to 1990, when he was promoted to associate professor in the Department of Telematics Engineering. Since 1998, he has been a professor at the Universidad Carlos III of Madrid, Spain. Since 1998, he has been a deputy vice-provost for academic infrastructures at the Universidad Carlos III of Madrid. He has participated in more than 15 European research projects and has performed direct consulting and engineering work for several different institutions, such as the European Space Agency, MFS-Worldcom, the Madrid Regional Government, RENFE, and REPSOL. Dr. Azcorra has served on the program committees of several international conferences and has more than 50 publications in international magazines, books, and conferences. He was a program chair of IEEE INFOCOM 2006. His current research projects include broadband networks, multicast teleservices, active networks, and IP/ATM convergence. He is a member of the IEEE.

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