

Call Admission Policies for DS-CDMA Cellular Networks Based on Power Control Setpoints

by Derong Liu, University of Illinois at Chicago

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About the Speaker

Derong Liu received the Ph.D. degree in electrical engineering from the University of Notre Dame in 1994, the M.S. degree in electrical engineering from the Institute of Automation, Chinese Academy of Sciences, Beijing, China, in 1987, and the B.S. degree in mechanical engineering from the East China Institute of Technology (now Nanjing University of Science and Technology), Nanjing, China, in 1982. From 1982 to 1984, he was a product design engineer at China North Industries Corporation, China. From 1987 to 1990, he was an instructor at the Graduate School of the Chinese Academy of Sciences, Beijing, China. From 1993 to 1995, he was a research staff at General Motors Research and Development Center, Warren, Michigan. From 1995 to 1999, he was an assistant professor in the Department of Electrical and Computer Engineering, Stevens Institute of Technology, New Jersey. He joined the University of Illinois at Chicago in 1999 as an Assistant Professor of Electrical Engineering and Computer Science, where he is now an Associate Professor of Electrical and Computer Engineering, of Bioengineering, and of Computer Science. He is coauthor (with A. N. Michel) of the books *Dynamical Systems with Saturation Nonlinearities: Analysis and Design* (New York: Springer-Verlag, 1994) and *Qualitative Analysis and Synthesis of Recurrent Neural Networks* (New York: Marcel Dekker, 2002). He is coeditor (with P. J. Antsaklis) of the book *Stability and Control of Dynamical Systems with Applications* (Boston, MA: Birkhauser, 2003).

Dr. Liu served in the Conference Editorial Board of the IEEE Control Systems Society (1995-2000), and as an Associate Editor for IEEE Transactions on Circuits and Systems-I: Fundamental Theory and Applications (1997-1999) and IEEE Transactions on Signal Processing (2001-2003). Since 2004, he has been an Associate Editor for IEEE Transactions on Neural Networks. In addition, he has been serving as a member of organizing and/or the program committees of several international conferences. He was recipient of the Michael J. Birck Fellowship from the University of Notre Dame (1990), the Harvey N. Davis Distinguished Teaching Award from Stevens Institute of Technology (1997), and the Faculty Early Career Development (CAREER) award from the National Science Foundation (1999). He is a member of Eta Kappa Nu.

About the Talk

This talk presents call admission control algorithms for SIR-based power-controlled DS-CDMA cellular networks. We consider networks that handle multiple classes of services or multimedia services. When a new call (or a handoff call) arriving at a base station requesting for admission, our algorithms calculate the desired power control setpoints for the new call and all existing calls. These calculations are based on the interference received at the base station and the desired quality of service target for each call. If the desired power setpoints to be received at the base station for some calls are larger than the maximum allowable power limits, the admission request will be rejected. Otherwise, the admission request will be granted. When higher priority is desired for handoff calls, we allow different thresholds for new calls and handoff calls. We have developed an adaptive algorithm that adjusts these thresholds in real-time as environment changes. The performance of our algorithms is shown through computer simulation and comparison with existing algorithms.

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