

PHY-APP Cross-Layer Design for Mobile Video

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Abstract:

This talk will focus on cross-layer design for mobile video transmission, and is motivated by the tremendous demands that video users have placed on the capacity of wireless networks in recent years. The emphasis is on joint optimization of the physical and application layers for levels of mobility ranging from fixed wireless to vehicular speeds. The basic philosophy of the cross-layer design is first discussed, and then various examples are presented for both scalable and non-scalable video. These examples include the joint optimization of single-carrier MIMO systems in conjunction with motion-compensation techniques for scalable video, and OFDM-based video-slice to subcarrier-mapping techniques for non-scalable video. Metrics for evaluation of the usefulness of the cross-layer approach will include both the performance of individual users and the capacity gain of multiplexed users.

Bio:

Laurence B. Milstein (S66, M68, SM77, F85) received the B.E.E. degree from the City College of New York, New York, NY, in 1964, and the M.S. and Ph.D. degrees in electrical engineering from the Polytechnic Institute of Brooklyn, Brooklyn, NY, in 1966 and 1968, respectively.

From 1968 to 1974, he was with the Space and Communications Group of Hughes Aircraft

Company, and from 1974 to 1976, he was a member of the Department of Electrical and Systems Engineering, Rensselaer Polytechnic Institute, Troy, NY. Since 1976, he has been with the Department of Electrical and Computer Engineering, University of California at San Diego, La Jolla, where he is the Ericsson Professor of Wireless Communications Access Techniques and former Department Chairman, working in the area of digital communication theory with special emphasis on spread-spectrum communication systems. He has also been a consultant to both government and industry in the areas of radar and communications.

Dr. Milstein was an Associate Editor for Communication Theory for the IEEE TRANSACTIONS ON COMMUNICATIONS, an Associate Editor for Book Reviews for the IEEE TRANSACTIONS ON INFORMATION THEORY, an Associate Technical Editor for the IEEE Communications Magazine, and the Editor-in-Chief of the IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS. He has been a member of the board of governors of both the IEEE Communications Society and the IEEE Information Theory Society, and was the Vice President for Technical Affairs in 1990 and 1991 of the IEEE Communications Society. He is also a former Chair of the IEEE Fellows Selection Committee, and is a recipient of the 1998 Military Communications Conference Long Term Technical Achievement Award, an Academic Senate 1999 UCSD Distinguished Teaching Award, an IEEE Third Millennium Medal in 2000, the 2000 IEEE Communication Society Armstrong Technical Achievement Award, and various prize paper awards.

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