TECHNOLOGY

Combined Power Control and Space-Time Diversity

OVERVIEW

The present invention is a joint power control and space-time diversity scheme for uplinks and downlinks in wireless networks with fading channels. It is ideal for use in base stations for cellular communication systems (both CDMA and TDMA) using smart antennas.

The invention:
1) increases capacity in wireless networks;
2) guarantees signal to noise ratios and quality of service;
3) is amenable to distributed implementation; and
4) saves transmitted power and battery life.

In the uplink, mobile powers and equalization/diversity combining vectors at base stations are calculated jointly. The mobile transmitted power is minimized, while the Signal to Noise Ratio (SNR) at each link is maintained above a threshold. A multitap transmit diversity scheme for the downlink is also proposed where the transmit weight vectors are adjusted such that the SNR at each mobile is set to a specified value. The proposed transmit and receive diversity combining schemes can be applied to networks with fading channels and in cases where the number of cochannels and multipaths are larger than the number of antenna elements. The proposed algorithms achieve the optimal solution for the uplink that minimizes the mobile power, and achieves a feasible solution for the downlink.

See US patent no. 6,377,812

For more information, contact the Office of Technology Commercialization, 301-405-3947 or otc@umd.edu.

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive license

CATEGORIES

- Microelectronics

EXTERNAL RESOURCES

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