

Low cost smart antennas for wireless networks

Technology

Smart antennas are capable of continuously modifying their spatial emission and reception patterns to maximize communication efficiency. They allow to augment the systems range, reduce interference and even reach users with obstructed line-of-sight. However, the signal processing operations and algorithms associated with smart antennas is highly complex and costly, and that is the main drawback which has prevented their widespread deployment until now.

Our simplified approach to process the signals from array antennas allows us to attain the performance levels possible with large arrays at a price and complexity point comparable to that of standard one antenna access point.

Our approach also provides immunity to interference and intrusion (piracy) right at the physical layer.

The proposed method consists in selecting a reduced subset of antennas within the full antenna array to subsequently perform dynamic processing on the subset only. Since the dynamic processing is performed on the subset only, the complexity and computational overhead is reduced by at least an order of magnitude with only negligible loss of performance compared to full-array processing.

Applications

- Array receivers for use in base stations of cellular telecommunication networks;
- WiFi wireless networks for industrial environments;
- WiMAX.

State of development

Field ready prototype.

Competitive advantages

The proposed technology can:

- augment the range by a factor of 4;
- secure networks at the physical layer; and
- combat severe electromagnetic interference typical of industrial environments.

Business opportunity

Université Laval is seeking partners to develop and commercialize this technology.

Intellectual property

Array receiver with subarray selection, S. Roy, priority date July 30 2002.

Issued: US6,907,272
EP 1525677 (GB, DE, FR)
CN427687

Applied for: CA2,495,128
JP2005535171T

Multi-user adaptive array receiver and method, S.Roy, priority date January 30 2004.

Issued: US20070142089
Applied for: EP1709745
CN1922789A
CA2,553,678
JP2006-549821

Method and apparatus for signal acquisition in OFDM receivers, L. Dupont and S.Roy, priority date August 6 2007.

Applied for: US12/672,663
EP2198525
CA2,695,792

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