

Equalization Techniques for Wireless Communications – Theory & Applications

Equalization techniques which can combat and/or exploit the frequency selectivity of the wireless channel are of enormous importance in the design of high data rate wireless systems. Although such techniques have been studied for over 40 years, recent developments in signal processing, coding and wireless communications suggest the need for paradigm shifts in this area. On one hand, the demonstrated efficiency of soft-input soft-output signal processing algorithms and iterative (turbo) techniques have fuelled interest in the design and development of nearly optimal joint equalization and decoding techniques. On the other hand, the popularity of MIMO communication channels, rapidly time varying channels due to high mobility, multi-user channels, multi-carrier based systems and the availability of partial or no channel state information at the transmitter and/or receiver bring new problems which require novel equalization techniques. Hence, there is a need for the development of novel practical, low complexity equalization techniques and for understanding their potentials and limitations when used in wireless communication systems characterized by very high data rates, high mobility and the presence of multiple antennas.

The focus of this J-SAC issue will be on recent advances in theoretical and practical aspects of equalization techniques for wireless communications systems. Original contributions, previously unpublished and not currently under review by another journal are solicited in areas including (but not limited to) the following

- Joint equalization and decoding techniques including turbo equalization and other graph based signal processing techniques
- Blind, Semi-blind and training based techniques for joint/iterative synchronization, channel estimation, equalization and decoding
- Novel soft input soft output equalization algorithms for SISO and MIMO systems
- Algorithms for two dimensional equalization
- Frequency domain equalization for single carrier broadband wireless systems
- Equalization for WCDMA systems including downlink chip equalization
- Diversity aspects of equalizers
- Channel shortening and equalization techniques for multi-carrier systems
- Bounds on the capacity of ISI channels, channels with timing errors etc
- Analytical and semi-analytical tools for performance evaluation of iterative signal processing techniques such as extensions of EXIT charts
- Applications to Wireless LANs, WiMax, UWB, and other communication systems

Prospective authors should follow the IEEE J-SAC manuscript format described in the Information for Authors. All papers must be submitted in PDF format via email to Ms. Paula Evans at jsacequalization@gmail.com according to the following timetable:

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