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## Efficient power allocations for multicarrier systems

**Waleed E Al-Hanafy**  
Menoufia University, Egypt

In OFDM, multiplexing over MIMO channels or general trans-multiplexing techniques a number of independent sub-carriers or sub-channels arise for transmission, which differ in SNR. Maximizing the channel capacity or data throughput under the constraint of limited transmit power leads to the well-known and simple water-filling algorithm. However, the performance of water-filling algorithm is generally degraded by the bit-loading following it. Alternatively, incremental bit-loading can optimize the data rate if greedy power allocation is considered. The problem of the greedy algorithm is its associated computation complexity bottleneck which prevents its use in many recent wireless applications. The focus of this presentation will be the simplified state-of-the-art greedy-based power allocation techniques. This presentation will provide novel computationally efficient sub-optimal greedy-based power allocation algorithms to maximize data rate of multicarrier systems. Moreover, mean BER enhancement of the resulting bit-loading can be achieved by considering residual power redistributions which aim to relate rate maximization in conjunction with margin maximization design problems. The evaluation will include analysis, simulation, and discussions of the results.

### Biography

Waleed E Al-Hanafy received BS and MS degrees from Menoufia University, Menoufia, Egypt, in 1996 and 2002, respectively, and PhD from University of Strathclyde, Glasgow, UK, in 2010, all in electronics engineering. He is working as an Assistant Professor at the Department of Electronics and Communication Engineering, Faculty of Electronic Engineering, Menoufia University. His research interests are mainly in the signal processing for communications. He is a Member of IEEE and EURASIP societies and a Reviewer of many conferences and journals.

[waleed\\_alhanafy@yahoo.com](mailto:waleed_alhanafy@yahoo.com)

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