

Patcharapol Kas-udom 2013: Energy-Efficient Bit Allocation for Power-line Communication Channels. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Wiroonsak Santipach, Ph.D. 73 pages.

This thesis presents two energy-efficient bit allocations for power-line OFDM channels which are the optimal bit allocation and on-off bit allocation. Both allocations are analyzed for deterministic channel model proposed by Zimmermann and random channel model. The optimal bit allocation can decrease transmit energy consumed by as much as 83% when compared to the uniform bit allocation for Zimmermann channel. The on-off bit allocation can decrease transmit energy by as much as 73% and performs close to the optimal allocation when transmission time is reduced. For random channel model, total transmit energy depends on the number of on subchannels in the on-off allocation, which is analyzed for a large system. The large system analysis can predict a practical system very well.

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Thesis Advisor's signature

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