

IEEE 802.16a 無線都會網路傳收機設計 與效能評估

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正交分頻多工(Orthogonal Frequency Division Multiplexing, OFDM)已被認為是實現未來高速資料傳輸的重要技術；並且，它也成功地被廣泛使用在多種應用領域。本論文在 IEEE 802.16a 無線都會網路 OFDM Mode 的標準下，發展 DL Preamble 能量偵測、碼框同步、保護區間長度估測、通道估測、載波頻率偏移估算、取樣頻率偏移估算等的演算法。此外，我們建立了一包含上述所有演算法的 IEEE 802.16a 無線都會網路 OFDM Mode 之接收機模擬平台。根據電腦的模擬結果，我們驗證了所提出演算法的可行性。最後，為了符合 IEEE 802.16a 無線都會網路 OFDM Mode 系統的規範，在不損失系統效能的前提下，我們也提出降低演算法實現成本的方法。

IEEE 802.16a Transceiver Design and Its Performance Evaluation

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Orthogonal frequency division multiplexing (OFDM) is a promising transmission technology for future high data rate communications. It has been successfully used in wide varieties of applications. In this thesis , based on the standard of IEEE 802.16a OFDM Mode, we design the algorithms for the detection of DL Preamble energy, frame synchronization, CP estimation, channel estimation, frequency offset estimation and clock offset estimation. . In addition, a complete simulation platform, involving all the algorithms mentioned above, is developed for the transceiver that complies with the IEEE 802.16a system specification. According to the simulation results, it is found that all our proposed algorithms are feasible. Finally, in order to satisfy the requirements of specification, we also propose methods to lower the implementation cost without losing the system performance.