跳時 PPM 超寬頻通訊系統的多用戶檢測及盲蔽式信號接收

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摘 要

本篇論文架構於跳時（time-hopping）脈波位置調變（PPM）之超寬頻（UWB）脈波無線電（IR）通訊系統，主要分成多用戶檢測及盲蔽式信號接收兩部分。本文提出數種線性多用戶檢測器，在頻率選擇性衰減通道，對多用戶存取干擾（MAI）進行有效抑制，順利的擷取出目標資訊位元。而後我們發展出了兩種低複雜度的行動台（MS）接收機。其中一種乃源自於傳統的耙式接收機(RAKE receiver)，另一種則是為了最小化輸出功率（minimum output energy, MOE）的目標而設計。然而這兩種接收機均須仰賴精確的通道估計，因此我們便推演出了一種盲蔽式（blind）的通道估計法則，同時針對幾個可能有關因子，分析通道估計準確度的相對影響。而由驗證分析的部分可發現，兩種接收機不僅改善了遠近（near-far）效應、多用戶存取干擾問題，同時對於系統效能亦有所增益。

關鍵詞 : 跳時、超寬頻、線性多用戶檢測、多用戶存取干擾、盲蔽式信號接收、最小輸出功率

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