

國立交通大學

電子工程學系 電子研究所碩士班

碩士論文

先導訊號輔助式之正交分頻多工通信系統  
通道估測設計



Pilot-Aided Channel Estimations for OFDM Systems

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中華民國九十三年六月

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碩士論文



Submitted to Department of Electronics Engineering & Institute of Electronics

College of Electrical Engineering and Computer Science

National Chiao Tung University

in Partial Fulfillment of the Requirements

for the Degree of

Master of Science

in

Electronics Engineering

June 2004

Hsinchu, Taiwan, Republic of China

中華民國九十三年六月

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## 摘 要



在本篇論文中，我們研究了正交分頻多工通信系統的通道估測及等化。在論文的第一部分，我們比較了不同通道內插估測方法在 IEEE 802.16a 和 DVB-T 通信系統中的表現效能包括線性、Lagrange、cubic spline、cubic Bspline、DFT-based 和 DCT-based 內插器；而發現線性及 cubic Bspline 內插器有著較佳的位元錯誤比率。如果同時考量運算複雜度的話，通道估測採用線性內插器是一個較佳的選擇。在論文的第二部分，我們研究了由快速衰減通道和載波頻率偏差造成的頻道之間相互干擾對正交分頻多工通信系統的影響。根據通道線性變化的假設，參考現有的方法，我們提出一個能夠有效減低頻道之間相互干擾的估測方法。

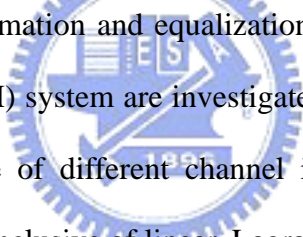
# Pilot-Aided Channel Estimations for OFDM Systems

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## Abstract



In this thesis, channel estimation and equalization for the Orthogonal Frequency Division Multiplexing (OFDM) system are investigated. In the first part of the thesis, we compare the performance of different channel interpolation schemes in IEEE 802.16a and DVB-T systems inclusive of linear, Lagrange, cubic spline, cubic Bspline, DFT-based, and DCT-based interpolators. As a result, linear and cubic Bspline interpolators show better bit error rate. Concerning the computational complexity as well as the performance, the linear interpolator is considered as a proper choice for channel estimation. In the second part of this thesis, we investigate the effect of inter-carrier interferences (ICI) caused by fast fading channels and carrier frequency offsets., According to the linear assumption of channel impulse response, we propose an estimation method that can reduce the ICI effect efficiently based on a current channel estimation method.

## 誌謝

對於能夠順利完成我的碩士學位，首先要感激的是我的指導教授陳紹基博士，在這兩年中對於我的課業研究著實提供了許多幫助，在我感到困惑時，適時的引導正確的方向，就像迷航的船隻驚見遠方明亮的燈塔那般；另外在生活上也使得我成長不少，懂得該如何應對進退、待人處事，在此獻上由衷的感激。

另外要感謝的就是 429 實驗室的夥伴們，伴我度過兩年的研究所生涯，陪同我一起歡笑、一起玩樂、以及一起苦悶。我不能想像如果這兩年沒有你們這群朋友，我的生活將會是怎麼樣？尤其是卓卓學長、明秀、小紀、A 貓、以及昆蟲，兩年之中，我們大概有四分之三的時間是在一起努力的，謝謝你們；雖然要畢業了，但是希望能夠在未來多聚聚。

最後，要感謝這兩年默默支持我的家人，給我許多呵護跟包容，使得我能夠順利的完成學業，謝謝。





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