複數型神經網路

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摘 要

本論文是針對神經網路在解決複數值問題上的綜合探討。由於神經網路具備高度非線性函數近似的特點，在許多複雜的非線性系統都能表現它良好的適應能力。推廣到快速成長的訊號處理領域，複數型神經網路可作為目標偵測、干擾抑制的適應性演算法。然而傳統的倒傳遞法，往往要經過多次實驗以決定最佳的學習速率，對於設計一個需要高可靠度的智慧型系統則略顯不足。 本論文提出一種有效的方法以克服在數位通訊系統中訊號失真的情況。我們應用延伸式卡門濾波器法則於複數神經網路的學習上，並採用節點退耦的方式降低計算複雜度。相較於倒傳遞法，延伸式卡門濾波器至少具有下列幾項優點:⑴以動態更新的卡門增益取代需預先設定的學習速率。⑵參數初值的設定對於訓練問題較不敏感。⑶快速的學習能力。⑷由VLSI實現可加速平行處理。此外，在通道等化問題中，我們將複數神經網路配合決策回授，並模擬基頻操作的QAM與PSK調變訊號。最後，我們藉由不同特性的無線傳輸通道與其他法則比較，實驗結果展示本法的強健性與準確性

關鍵詞 : 複數型神經網路；複數型放射狀基底函數網路；倒傳遞法；適應性等化器；

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