

# USE OF NEURAL NETWORKS AS CHINESE FOUR TONE RECOGNITION EXPERT SYSTEMS

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## *Abstract*

In most of expert systems, crispy or fuzzy if-then rules are generally derived from human experts using linguistic information. However, the initial linguistic rules are invariably rather crude and, although qualitatively correct, need to be refined to achieve better performance. Therefore the major issue in designing an expert system lies on automatically computing an appropriate collection of if-then rules directly from experimental data. This paper presents a neural network-based system which is trained in such a way that it provide an appealing solution to the problem of knowledge acquisition based on experimental numerical data. The values of the network's parameters, after sufficient training , are then utilized to generate both crispy and fuzzy if-then rules. The concept and method presented in this paper are illustrated through one continuous Chinese four tone recognition problem.

## 由類神經網路建立中文四聲辨認專家系統

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## 摘要

在大多數的專家系統中，無論是 Crispy 或 Fuzzy 的 if-then 式的規則，大致上都是從人類專家口語上的敘述而得。然而，這些初始的口語規則是非常地籠統（雖然定性上是正確的），仍需進一步修改以達到更好的效果；因此設計專家系統的關鍵所在，就是如何從一組資料中萃取出適當的規則來。這篇論文探討如何藉訓練類神經網路來解決這種規則萃取的問題。在經過充份的訓練之後，網路上的參數可被用來建立 Crispy 和 Fuzzy 的 if-then 規則。本論文的觀點及方法，是以一個連續的中文四聲辨認問題作為例證。