

## 計畫編號：07

計畫名稱：華語發音教學軟體之研究開

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計畫中文摘要：

在全球化環境之衝擊下，學習第二語言或其他更多語言將為所有人之生存發展所必須。一般認為學習第二語言最理想的條件是先學聽、說，後學讀、寫，就和學習母語一樣。但學習聽、說需要大量長時間練習的機會，這也是一般語言學習的最大障礙。此時專人一對一教學效果最好，但代價極高。如改由電腦軟體擔任教師，設置網站，全球學習人口均可上網自行學習，相當於一對一專人教學。軟體不會疲倦，不會生氣也不需休假，相當於隨時在身邊的專用教師，是語音技術發展產業之絕佳機會。目前坊間的語音學習軟體幾乎都只照顧到語音示範的層次，幾乎都欠缺發音偏誤之偵測與導正機制，這正是本計畫之目標。今日全球學習華語之熱潮才剛起步，如果所有人都只需上網即可享有相當於有專人指導的一對一教學，未來商機無可限量。

本計畫以研發協助外國人學習華語之軟體為目標。一般人學習外語最大的困難是目標語言中的若干發音機制常是母語中沒有的。如果目標語言中某個發音 X 不會發音，乃說成 W，或 Y，或 Z，並自動使所有帶有 X 的字、詞、句的發音都受影響。這就是一般學習者常會發生的偏誤類型(Error Pattern)，通常與目標語言中母語所欠缺的發音機制有關。語言教學軟體可以針對這些偏誤類型分別自動偵測學習者有沒有發錯音，是把 X 說對了，還是說成了 W，Y，或 Z，並教學習者如何矯正其發音，把 W，Y 或 Z 矯正為正確的 X。本計畫初步目標以美國人的英語(American English)為母語，華語為目標語言，軟體中自動呈現繁體，簡體，注音符號，通用拼音，漢語拼音等，由使用者自行選擇學習目標。

本校文學院有華語教學單位，對華語教學擁有豐富之專業經驗，不論外國人學習華語之教材，錄音分析，偏誤類型整理等，均有先天優勢。本校電資學院李琳山教授的語音實驗室對華語語音之研究分析更獨步全球，世界知名。本校醫學院有語言矯正治療醫師，就發音矯正亦有特殊專業。故本計畫在本校執行，可以有效整合不同專業，顯然擁有先天優越條件及競爭優勢。

本計畫的最大困難，在整體軟體系統規模龐大複雜，非校內師生所能處理，而規模龐大的高品質商品軟體尤非學生所能撰寫；再加上這個領域競爭激烈，各方團隊爭食大餅勢所難免，必須以最快速度推出產品搶佔市場，才有獲勝機會。故本計畫必須與產業界密切合作，借助其已有經驗之軟體工程師及大型軟體整合與品質控管經驗，爭取時間，務求在最短時間內推出產品，希能擊敗敵手，搶佔市場。

本計畫共包括兩個分項計畫：分項計畫(一)華語教學資料之蒐集，分析，確認與發音導正之教材編寫，分項計畫(二)語音處理技術研究及軟體系統開發。第一階段計畫至 97 年 7 月 31 日為止計 24

個月，而本計畫為第二階段，自 97 年 8 月 1 日至 98 年 7 月 31 日為止。第一階段已有十分豐碩之成果，包括「臺大華語」產品推出上線供使用者試用及兩件專利申請。但由於此一領域競爭者眾，技術進步一日千里如逆水行舟，不進則退，第一階段所完成的僅為陽春版本，故第二階段計畫的目標是進一步提昇「臺大華語」的技術層次，並配合營運相關措施。

計畫英文摘要：

Learning a second or more languages in addition to the native language will be very important for all people in the world under the trend of globalization. It has been well known that the best way to do this is to learn the ways of listening and speaking first, and reading and writing later on, just as we learn our native language. Learning a language with a personal tutor is the most efficient but very expensive. If a software can play the role of a tutor, the product will be very attractive. The software won't be bored and can work any time. Today most language learning software can only produce and demonstrate the correct pronunciation, but lacks the capability to detect and correct the pronunciation errors of each individual learner. The latter is the goal of this project.

The most difficult part of learning a target language different from the learner's native language is those pronunciation mechanisms not existing in his native language. Suppose a phoneme X doesn't exist in his native language, the learner cannot produce it, thus may produce it as a different phoneme W, Y or Z, and this happens in all utterances including X. This forms some kind of error pattern, usually existing for a pair of native language and target language. The software to be developed by this project should be able to automatically detect such error pattern and teach the specific learner to try to correct these errors. In this project the target language is Mandarin, and the native language is American English. This project will try to integrate the expertise of the International Chinese Language Program and the College of Electrical Engineering and Computer Science of National Taiwan University.

The most difficult part of this project is the goal of producing the very complicated practically useful commercial software, as well as the very strong competition from other similar softwares on the market. This is why this project has to cooperate closely with a software industry partner to make use of its experienced software engineers and experiences in producing and marketing commercial software, so as to be able to make the completed software available on the market in time and make it a successful product.

This project include two sub-subjects: Sub-project (1)-Collection, Analysis of Pronunciation Corpora and Compilation of Mandarin Chinese Teaching Material, and Sub-project (2)-Speech Processing Technologies

and Software Development. The first project ends on July 31 2008, while this proposal is for phase II for Aug 2008 to July 2009. Very good achievements have been produced in the first phase, including the product “NTU Chinese” has been on-line and two patent applications filed. The goal of phase II is to further advance the technology so as to face the challenges of many other competitor products.