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论文

一般拓扑结构的非齐次隐含马尔科夫模型及其在中、英文语种辨识中的应用

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摘要
为了充分利用语音信号中的段长信息，该文提出了一种具有一般拓扑结构的非齐次隐含Markov模型(Hidden Markov Model, HMM)，并将其应用于中、英文语种辨识(Language IDentification, LID)系统。非齐次HMM既很好地描述了语音信号的发生过程，又准确地利用了状态的段长信息和语言中的上下文连接结构信息，对于中、英文语种辨识系统，非齐次的HMM系统辨识性能好于齐次的HMM模型。而在非齐次的HMM中，同段长为均匀分布相比，段长分布为正态分布时系统的辨识性能更好，表明段长确实是一种重要的语种区分信息之一，且正态分布较均匀分布更接近于真实的段长分布。

关键词 语种辨识 非齐次隐含Markov模型 段长分布

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The Inhomogeneous HMM with General Topological Structure and Its Application in Language Identification between Mandarin and English

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Abstract
In order to use duration information in Language IDentification (LID) efficiently, the inhomogeneous Hidden Markov Model (HMM) with general topological structure is proposed, and is used to identify the language between Mandarin and English also. Because the inhomogeneous HMM with general topologic structure not only describes the duration of state more accurately than HMM, but also uses the structure information of specific language phonetics more effectively, the LID system based on the inhomogeneous HMM with general topological structure has better performance than the homogeneous HMM. For the LID system based on inhomogeneous HMM with different duration distribution, the norm distribution has better performance than the uniform distribution, it shows that the state duration is an important cue for language identification and the norm distribution can model the duration more accurately than the uniform distribution.

Key words Language identifier Inhomogeneous hidden Markov model Duration distribution

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