

A Mobile Kanji Learning System for the Apple iPod Platform

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Summary. Native speakers of languages with alphabetic writing systems face a large hurdle when learning Japanese as a second language: learning the written forms and meanings of approximately 2000 daily-use Japanese kanji characters. Here we present a mobile system, implemented on the Apple iPod platform, for assisting a student in memorizing the written forms and meanings of kanji. Our system builds on the ideas of our earlier passive-mode PDA-based system [3], using hierarchical component-based analysis of kanji shapes (Heisig, [1]).

In our new system, we implement two learning modes: a passive audio-only review mode, and an interactive audio-visual review / quiz mode, with easy switching between the two modes. The mobile implementation platform combined with passive and interactive review modes allow our system to be used effectively in a variety of mobile learning situations, even when the user's hands and/or eyes may not be available to operate the device.

1 Introduction

Our aim is to use mobile computer technology to help the student of Japanese as a second language (JSL) learn kanji in anytime, anywhere mobile learning situations. The basic kanji competencies required of a JSL student include learning: visual shape; meaning; readings; usage in compound words. Heisig's (first) book [1] is unusual in that it deliberately emphasizes initial learning of *only* shape and meaning of a large number of kanji – the approximately 2000 daily-use kanji – initially ignoring readings and compound usage. We believe this approach effective and developed a novel mobile computing system to support kanji learning using this method. The novel features of our system are a combination of two modes of learning – an audio-only, passive mode; and an audio-visual, interactive mode – and implementation on a readily-available, portable consumer device.

2 Related work

Practically all computerized systems for teaching kanji (e.g. [2]) assume that the student's eyes

are available to look at the system during learning, and imply that the sense of sight needs to be used at all times when learning kanji. Our previous mobile system [3] challenged this idea by implementing an audio-only review of kanji shapes. The system described in this paper implements a “best-of-both-worlds” situation, allowing both non-visual and visual modes depending on the user's mobile learning situation and preference.

3 System Design and Implementation

3.1 Hierarchical data organization

Each kanji is described in three ways: (1) an image of its visual form (2) a single meaning word describing its meaning, and (3) a list of words describing the names of the more basic components comprising the kanji's visual appearance. Because of the hierarchical visual construction of kanji, one kanji's meaning word will often appear in the component list of a more complex kanji.

3.2 System design

See Figure 1. We first construct a text database with 2000 kanji meanings and their part names. The text data is spoken by a speech synthesizer, and the spoken audio saved in 2000 files for kanji meanings and 2000 for kanji parts. Finally, we created 2000 image files, one for each kanji. The data was uploaded to a 4th generation Apple iPod (20GB) along with our learning software, written under iPod Linux.

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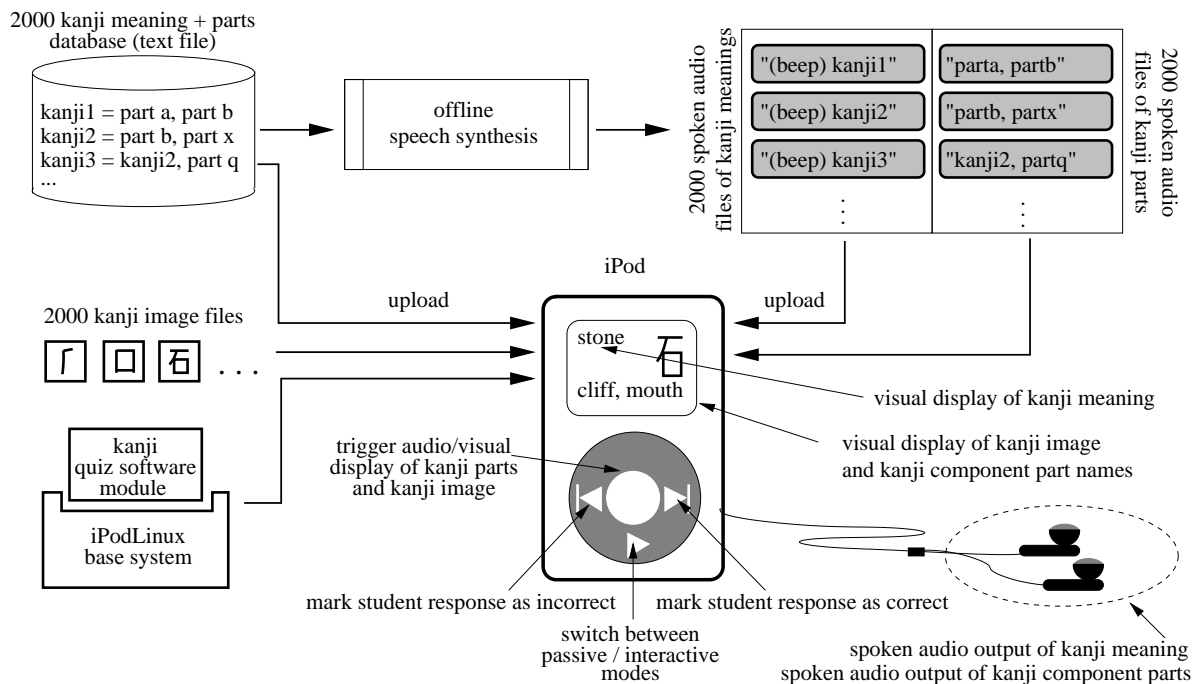


Figure 1. The parts of our iPod-based kanji learning system.

3.2.1 Interface and usage

After starting the application, the user can switch between two modes of operation with a single press of the “play” button. In *passive audio-only mode*, the system can be used with only audio information and with no user interaction. The system continuously and randomly chooses one kanji from the database, plays audio of a separator beep, then plays audio of the spoken keyword for the kanji meaning. Next, the system pauses for four seconds, during which the student should mentally recall the part names of the kanji. Finally the system automatically speaks the kanji part names, allowing the user to mentally check if his answer was correct. In *interactive audio-visual mode*, the system depends on user interaction and supplements the audio information with visual information. First, the system speaks a randomly-selected kanji meaning and prints the keyword on the iPod screen. Next, the system pauses, and the student takes as much time as necessary to recall the kanji’s component part names, and finally presses the middle iPod button. Finally, the system then plays spoken audio of the component part names, and displays an image of the kanji. This allows the student to check the accuracy of his memory of the part names and the

visual placement of those parts in the kanji written form. After seeing the correct answer, the student can indicate by button presses if his answer was right or wrong. This is intended to allow for score-keeping and student-tailored review of failed kanji, though this feature is not yet implemented.

4 Conclusion and Future Work

Our system is unique in allowing two modes of kanji review; passive audio-only (requiring no use of user’s hands or eyes) and an interactive audio-visual mode, allowing anytime, anywhere review of kanji. Future work involves student performance evaluation, user studies, and providing multi-modal mnemonic assistance to help the initial memorization task.

References

- [1] James Heisig. *Remembering the Kanji I: A complete course on how not to forget the meaning and writing of Japanese characters*. Japan Publications Trading Co., Ltd., 1985. Third edition.
- [2] KanjiGym Light home page. <http://kanjigym.de>.
- [3] Norman Lin and Kenji Mase. An audio-based approach to mobile learning of Japanese kanji characters. In *Proceedings of the 5th World conference on Mobile Learning 2006 (in press)*, 2006.