Abstract

Text Analysis for Thai Text-to-Speech Synthesis System on Embedded Device

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A Text-To-Speech (TTS) system is a computer system which can synthesize speech from a given text. Nowadays, many Thai TTS systems have been developed on devices with powerful computing resources such as a personal computer. However, porting these systems to a resource-limited device such as a mobile phone is not an easy task. A TTS system generally composes of three main components: text analysis, prosodic analysis, and speech synthesis. In this thesis, we focus on only text analysis module for Thai TTS on embedded devices. Basically, the text analysis module consists of two routines: word segmentation and grapheme-to-phoneme (G2P) conversion. This module prepares information from a given text to the speech synthesizer module in order to generate speech output. For the thesis work, we conduct two main sections: a comparison of the existing Thai text analysis algorithms section and a proposed technique section. The first section aims at studying several techniques for Thai text analysis in order to choose the most appropriate technique for mobile devices. This experiment has three sub experiments: word segmentation experiment, G2P conversion experiment, and combined experiment. We found that the Longest Matching technique for word segmentation and the dictionary-based technique for G2P conversion are suitable for the embedded devices. The second section aims at improving the text analysis part especially the G2P conversion of a Thai TTS system on mobile devices. The output of the G2P conversion plays a significant role of the overall TTS system quality, since it connects to the speech synthesizer module when synthesizing the output speech. In this experiment, we propose a new G2P approach using the multiple-sized unit dictionary and set of conversion rules. It can generate an unknown word's pronunciation that the dictionary-based technique is unable to generate.