PLACING CHINESE PHONETIC SYMBOLS ON MOBILE PHONES USING LINEAR PROGRAMMING

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Abstract. *Through the years, mobile phones have been widely used around the world and the short messaging service* (SMS), *in particular, has become indispensable. This feature of mobile communication has been the major value-added service of the telecommunication operators. This paper proposes to program Chinese phonetic symbols into mobile phones for better and faster communication among the Chinese. The main idea is to employ a linear programming model, paying attention to the frequency order of phonetic symbols. The results of our experiments show that through linear programming, the mobile phone has become more suitable for the real world.*
Keywords: Mobile phone, Chinese phonetic symbols, Linear programming

1. **Introduction.** Information technology has improved tremendously in the past five years, and the mobile phone "revolution" has improved communication across the globe. It has become one of our most important and prized possessions. According to an "International Telecommunications Union" [1] report, more than 50 percent of the people in many Asian countries use mobile phones. The most commonly used service of the mobile phone is the short messaging service (SMS). This service, provided by telecommunications operators, has become a major revenue source [9].

While SMS has enabled people to communicate with each other faster and more efficiently, the technology of multilingual communication has not reached its full potential. Mobile phones generally use English characters, which makes communication in English faster and more efficient, but this does not improve communications in other languages. Providing Chinese characters on a mobile phone is somewhat complicated because there are 37 phonetic symbols in Chinese, but the phone only has nine or ten buttons available for providing these phonetic symbols.

To improve the speed of typing Chinese characters on a mobile phone, some methods have been proposed to reduce the number of times the buttons must be pressed. Figure 1 shows the most commonly used keypad layout (modeled after a Nokia mobile phone) on mobile phones. However, this is not at all convenient when applied to Chinese characters. For example, when the desired Chinese character of Example 1 of Figure 2 is typed according to this order, it is necessary to press the buttons seven times to get the desired phonetic symbol combination; then the screen shows the result in the last column of Figure 2 where the correct character must be chosen.