論 文 内 容 の 要 旨
Abstract of Dissertation

氏 名
SHAKRANGE TURRANCE NANDASARA

The Sinhala writing system which is used in Sri Lanka is a syllabic writing system derived from Brahmi. Sinhala is consist of vowels, consonants, diacritical marks and special symbols constructs. Several of these constructs are combined to form complex ligatures. In the Sinhala language, the total number of different glyphs is almost close to 2300. Thus, all computer equipment that supports the Sinhala language needs to support a greater degree of complexity in memory management, output, display and printing with near minimal changes to the keyboard or the input systems.

The International scope of computing, information interchange, and electronic publishing have created a need for a standardized character-encoding scheme. In support of the standardization momentum, in order to enable Sinhala language and their scripts, the issues involved in the process of standardization of character codes primarily for the 8-bit machine and subsequently for the 16-bit code environments requires an extensive study. This research presents an extensive study on the significant issues involved in machine representation of textual information in graphical and phonetic approach for Sinhala scripts. A comprehensive evaluation of some of the possible representation are also presented. The design philosophy of Sri Lanka Sinhala Standard Code for Information Interchange (SLASCII) based on ISO 646 which also is based on the typewriter metaphor, considered along with the phonetic model of the SLS 1134:1996 following the guidelines of UCS/UNICODE and ISO 10646 philosophies are also presented.

One of the output of this research, the Unicode based Sinhala standard was formulated through a comprehensive and theoretical manner, the same was submitted to the Sri Lanka Standard Institute and forwarded to the international committees for further investigate. Having had lengthy discussions with international language experts, and considering also a public comment received from the local experts, Sinhala UNICODE code standard was published in its version 3.0, and Sinhala enabled operating systems and Sinhala application compatibilities are becoming available since then. Character codes require fonts that provide visual images—glyphs—corresponding to the codes in both 8 bits and UNICODE, and it should appear on the screen or paper by the language

of Sinhala, Pali and Sanskrit using this script with an acceptable and in a comprehensive manner. This research concludes by identifying some of the critical issues concerning the standardization at the character level and therefore, designed the standard guideline principles for standardization. Further, the context of SLASCII and SLS 1134:1996 and philosophy behind the design of ISO 10646 proposal are also studied.

This research, identifies (1) the rich diversity of the languages in the Asian region, (2) discusses the historical background of the Sinhala writing system, (3) studies the Sinhala scripts' characteristics and complexities, (4) illustrate how Sinhala computing technology has evolved over the last quarter-century and analysed (5) design of standards for Sinhala scripts for deferent technological stages from single-byte to multi-bytes environment. The design of Sinhala character code standards marks major steps as a cornerstone of whole architecture for text processing in Sri Lanka. Additionally, this study shows how small communities of non-Roman script users can connect to ("Digital Inclusion") the Romanised system dominated cyberspace over the past 30 years.