

INSPEC in Braille

J.M. Gill and M.D. Martin

Abstract

A joint project, between the Warwick Research Unit for the Blind and the Institution of Electrical Engineers, has established a pilot scheme for blind computer programmers and analysts to obtain monthly selective braille listings of the INSPEC data base.

Dr. J.M. Gill is a senior research fellow with the Warwick Research Unit for the Blind under a grant from the Department of Health and Social Security.

M.D. Martin is Manager, Retrieval Systems, INSPEC, Institution of Electrical Engineers.

Introduction

For any blind person with a scientific or technical background, keeping up-to-date with his subject raises special problems. The sighted person can go to his library and browse at will; and it is an accepted part of the work environment that resources are made available for him to do so. The blind person must obtain the help of his sighted friends and colleagues to read relevant articles for him; but before he can even do this, he needs a means of identifying what is relevant to him from current scientific literature. In the absence of any braille alerting service, he must depend upon having access to a sighted colleague with an equivalent technical background and a proper understanding of his interests.

This is a very real problem in the field of computer science, where technological change is rapid and continuous. In other respects, computing has been able to offer particularly good opportunities for the employment of blind staff on equal terms with their sighted colleagues, and there is now a significant group of blind computer programmers and analysts in the UK. It is in the hope of finding a solution to their information needs that this project has been undertaken.

To give some idea of the size of the problem INSPEC, the information service run by the I.E.E., adds about 130,000 items per year to its data base which covers physics, electrotechnology, computers and control. To handle this volume of information the system is, of necessity, computer-based.

Blind programmers and analysts nearly all use braille for both reading and writing, so an alerting service dependent on braille is acceptable in this situation. However this is not true for the rest of the blind population; out of the 106,000 registered blind in England and Wales only about 10,000 read braille regularly.

The Braille Language

The most common medium for printed material for the blind is based on the braille cell, developed in 1825 by the Frenchman Louis Braille. The braille cell consists of six dot positions, in two columns of three, with 2.5 mm between the dots. The basic cell can give 64 different patterns.

The dots are embossed to a height of 0.5 mm in either manilla paper or plastic; the former has the advantage that it is more comfortable to read by touch. Braille books are very bulky; for example the bible takes up 72 braille volumes.

Grade I braille uses one cell pattern for each letter of the alphabet, with some of the spare patterns for simple punctuation signs and abbreviations of a few very common words. Thus it is a trivial matter to automate the translation of text to grade I braille.

However grade II, or contracted, braille is normally used by most braille-readers in this country. Grade II braille makes extensive use of abbreviations and contractions to reduce the number of braille cells needed to represent the inkprint text.

The rules governing the use of contractions are not easily definable in mathematical terms since many of the rules depend on context. For instance 'one' may be used as a contraction when all three letters it represents are pronounced as a single syllable e.g. in 'stones' but not in 'anemone'. Another example, the abbreviation 'st.' is represented differently in contracted braille if it means 'street' or 'saint'. Contracted braille is a language not a code.

Although these rules result in a space saving of about 26%, they make braille difficult to learn and difficult to transcribe. It is impossible to achieve perfect grade II braille by automatic translation but it is possible to achieve a good thoroughly acceptable approximation with consistent results.

The translation program used in this project was originally written in Cobol for American grade II braille. At Warwick, it has been rewritten in Fortran IV for English grade II braille - unfortunately there is no international standard for contracted braille.

INSPEC

INSPEC is the IEE's information services division, covering current literature in physics, electrical and electronics engineering, computers and control.

Since 1969, INSPEC services have been derived from a computer-readable database, which is growing at the rate of over 130,000 'document records' each year. In terms of volume of use, the most important outputs from the database are still the printed abstracts journals and indexes, produced by computer typesetting techniques. But with the explosive post-war growth in the literature, these journals have become so large that they are now principally library tools, ill-suited to be used by the individual scientist or engineer as a means of keeping up-to-date with new publications in his field.

Fortunately the computer has provided new means of supplying the information needs of the individual. For example, 'selective dissemination of information' ('SDI') uses the computer to store coded statements ('profiles') prepared in close consultation with the user and describing his personal subject interests. Periodically, these stored profiles are matched against new material added to the database, and a listing of relevant items is produced and mailed to the user.

The IEE's INSPEC database is already being used to provide services of this kind in nearly 40 centres in 19 countries. Magnetic tapes are issued twice-monthly and distributed to the subscribing centres to be run on their local computer systems. Worldwide, we can estimate that somewhere between 6,000 and 10,000 scientists and engineers are now routinely receiving an individual literature alerting service from INSPEC tapes.

