Sachin S. mayekar, A Hindi script reading system, M. Tech. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, 1998.

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*Abstract* – A text reading system consists of scanner for obtaining the digital image of the text, a system for segmenting and recognizing in the characters of the text, a converter from text character stream to phonemic representation stream, and a speech synthesizer. Aim of this project is to develop a character segmenter/recognizer and a speech synthesizer, for such a system, for printed Hindi text in Devanagari.

Text image processing identifies the characters and "matras" in the image file obtained from a scanner. The image is segmented into basic characters and matras. Segmentation is done on the basis of pixel density in the following hierarchy: (i) lines, (ii) word boundaries, (iii) characters, (iv) basic characters and matras. These segments are identified by a character recognition algorithm, which compares the segmented image with a set of templates. At the end of the character recognition, we get a stream of character codes in DOE format, which is converted into a stream of allophone codes.

Speech synthesis is achieved by using synthesizer chip (SPO-256-AL2) that internally uses a formant based synthesis and has formant tracks for 64 English allophones internally stored. The control of the synthesizer chip is handled by an inexpensive microcontroller (AT59C2051), with a serial port interface for connecting to a computer. A program helps in selecting the appropriate set of English allophones to correspond to the allophones of Hindi. The unit shows a satisfactory performance for various words in Hindi/ marathi.