



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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This dissertation studies the acoustic phonetic properties of vowels in Assamese as spoken in five geographical regions of Assam: Tinsukia, Jorhat, Nagaon, Nalbari and Barpeta. The first part of the dissertation reports results of vowel production experiments conducted on the speakers from the five regions. The results showed that vowel quality across the five varieties is not uniform. Compared to the eight-vowel system proposed for standard colloquial Assamese, the speakers of the five areas produced only six or seven distinct vowels. In all cases the first two formants in vowel production were considered acoustic features. Vowel duration did not show any predictable pattern.

In order to confirm the results obtained from the production experiments, perception tests were also conducted on speakers from the five varieties in this study. Discrimination tests show low sensitivity of the speakers towards the vowel pairs that merged in production. The identification experiments showed that merged categories elicited more varied responses than distinct categories.

The merger of the vowels in the five varieties of Assamese was explored in detail in order to determine the extent and type of merger. Merger measures such as, Euclidean Distance, Pillai score, SOAM and VOACH were employed to investigate the mergers. The merged vowel pairs showed merger by approximation or expansion. These merger mechanisms differed according to the varieties.

Rhythm characteristics of Assamese read speech were also investigated in order to explore any possible correlation between vowel quality and rhythm characteristics. Attempts to classify the five varieties of Assamese using rhythm measures yielded moderate accuracy. Finally, automatic dialect identification was attempted using a Random Forest classifier with the first two formants as vowel features. The results showed that vowel features yield high accuracy in dialect identification in Assamese. This confirms that the dialect specific vowel characteristics represented by the first two formants, as shown in the production and perception experiments, are sufficiently robust. Thus, this work confirms that the five varieties of Assamese namely, Tinsukia, Jorhat, Nagaon, Nalbari and Barpeta are distinct in terms of their vowel inventory and vowel quality.