



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

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SHORT ABSTRACT

This dissertation provides a comprehensive description of the tonal phonetics and phonology of Mizo, a Tibeto-Burman language. Previous studies have confirmed four lexical tones in Mizo, namely, high, low, rising, and falling. Since lexical tones can have different characteristics, this thesis attempts to characterize the four Mizo tones in terms of phonology and phonetics. The phonological analysis of the Mizo tones using the four distinct Mizo tones embedded in different contexts with certain word classes and morphological domains revealed that tones in Mizo could have tonal alterations. Specifically, the tones with prominent dynamic contours, such as falling and rising in Mizo, are more inclined towards tone alteration. The phonological tonal process called tone sandhi is attested in this dissertation, whereby a rising tone becomes a low tone when followed by a high or a falling tone. The investigation of rising tone sandhi domains provided evidence that the tonal context entirely triggers this phenomenon. Furthermore, the results of the production and perception tests of rising tone sandhi revealed that the derived low tone from rising tone sandhi is distinct from the canonical Mizo low tone, and the native speakers of Mizo were able to perceive the two tones categorically. Phonetic analysis of the Mizo tones using acoustic features such as fundamental frequency, duration, and dynamic nature in five contexts confirmed four lexical tones. This study also presents the gender differences in producing Mizo tones. The comparative analysis of the five contexts conveyed that tones produced in a more natural speaking style have smaller ranges of fundamental frequency and duration. Furthermore, the automatic classification of the tones in Mizo conducted using Quadratic Discriminant Analysis (QDA) and Random Forest (RF) revealed that the slope feature plays a crucial role in classifying the four Mizo tones. Besides the acoustic characteristics of the canonical tones in Mizo, this dissertation also provided the changes to the tone contours due to the effect of stop consonants and vowel types. The study of Mizo stop consonants revealed that the stops in Mizo conformed to the universal Voice Onset Time (VOT) patterns whereby the voiceless aspirated

velar stop has the longest positive VOT, and the voiced unaspirated bilabial stop has the highest negative VOT. The analysis of the formant frequencies of Mizo vowels also substantiated that there are five distinct vowels in Mizo with long vowel counterparts, namely, /a, i, e, u, o/. Further investigation confirmed the significant interaction between Mizo tones and segments.

