



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

This thesis aims to enhance the quality of the narrowband speech signal transmitted in narrowband telephonic communication. The transmitted narrowband speech signal has frequency components in the range of 300-3400 Hz. Original speech signal consists of significant frequency components beyond this limit, making it easier to understand the speech signal, i.e., the speech quality and intelligibility are improved. Therefore, the received narrowband signal at the receiver end in the narrowband telephonic communication can be enhanced by recovering missing high-frequency components in the speech signal, typically in the frequency range 4-8 kHz. A process of recovering high-frequency components is known as an artificial bandwidth extension (ABE) process. The ABE process improves speech intelligibility and quality. The thesis proposes artificial bandwidth extension frameworks using the H^∞ sampled-data control theory and machine learning techniques. The performances of the proposed approaches have been evaluated by using objective and subjective measures. Also, these measures are computed for the two different datasets.