REAL-TIME ADAPTIVE FILTER FOR ENHANCEMENT QUALITY OF SPEECH IN LARYNGECTOMEE PATIENTS BASED ON TMS320C6713 PROCESSOR

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ABSTRACT

A person who has undergone laryngectomy commonly is called laryngectomee. The Laryngectomy is the removal of the larynx and separation of the airway from the mouth, nose, and esophagus. The laryngectomee breathes through an opening in the neck, a stoma. There were three attempts to rehabilitate the voice, i.e. esophageal speech, tracheoesophageal and electrolarynx. Generation of sound by electrolarynx most commonly accepted for phonation. Using of electrolarynx more easily generate a long sentence without special treatment and more effective way to communicate in various situations. Clarity speech of Electrolarynx is affected by the noise that generated by the device as well as noise arising from the surrounding environment. Objective of this study was to provide an alternative solution for patients with impaired laryngeal problems in order to have clarity in speech using neck-type electrolarynx device, Servox SI – SERVOXD, by utilizing an adaptive filter based on least mean square algorithm. Two microphones were used simultaneously, to obtain a record of speech signal and noise through a Starter-Kit TMS320C6713 Digital Signal Processor. The first microphone was used to record the speech and noise. The second microphone used to record the background noise. Measurement of signal to noise ratio (SNR) has been conducted to determine the ratio between speech signal and noise signal. From experimental results, the SNR before filtering at 10.817 ± 2.5 dB and after filtering was 28.312 ± 9.7 dB and increasing of electrolarynx speech quality was 17.4948 ± 11.2 dB by aiding Starter-Kit TMS320C6713 Digital Signal Processor.

Keyword : laryngectomee, electrolarynx, adaptive filter, least mean square, DSP TMS320C6713