Advanced signal processing techniques to measure and classify non-nutritive suction of premature and newly born babies

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Abstract:
This paper addresses a crucial problem that exists frequently in data processing of biomedical signals. Almost all of these signals have a very low signal-to-noise ratio and a careful hardware and software development are essential to obtain a meaningful and accurate measurement. This is really important, especially when human diagnostics are at stage, since errors can affect patient's health and sometimes endanger life. This paper proposes a measurement solution to obtain an accurate measurement of non-nutritive suctions (NSS) in premature babies in order to avoid excessive costs caused by superfluous occupation of intensive care units. Proposed signal processing techniques, based on Gaussian and progressive polynomial curve fitting techniques, are used to obtain an accurate value of sucking parameters. The application domain of the proposed measurement system can be extended to other biomedical measurement systems whenever low pressure measurements are required, particularly those related with nutritive sucking (NS).

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Contents

Measurement of non-nutritive suction (NNS) is a relevant information in which concerns premature babies health [1]–[3]. Many solutions have been studied to measure NNS with some accuracy [4]–[6]. Nowadays, there is still some research work in this area [7]. However, measurements' methods and specifications are missing in a large number of equipments that are used for NNS measurement.