

# Bulbar ALS Detection Based on Analysis of Voice Perturbation and Vibrato

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**Abstract:** On average the lack of biological markers causes a one year diagnostic delay to detect amyotrophic lateral sclerosis (ALS). To improve the diagnostic process an automatic voice assessment based on acoustic analysis can be used. The purpose of this work was to verify the suitability of the sustain vowel phonation test for automatic detection of patients with ALS. We proposed enhanced procedure for separation of voice signal into fundamental periods that requires for calculation of perturbation measurements (such as jitter and shimmer). Also we proposed method for quantitative assessment of pathological vibrato manifestations in sustain vowel phonation. The study's experiments

show that using the proposed acoustic analysis methods, the classifier based on linear discriminant analysis attains 90.7% accuracy with 86.7% sensitivity and 92.2% specificity.

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