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Sommario/riassunto	Long description: The analysis of speech of people with Parkinson's disease is an interesting and highly relevant topic that has attracted the research community during several years. The advances in digital signal processing and pattern recognition have motivated the research community to work on the development of computational tools to perform automatic analysis of speech. Most of the contributions on this topic are focused on sustained phonation of vowels and only consider recordings of one language. This thesis addresses two problems considering recordings of sustained phonations of vowels and continuous speech signals: (1) the automatic classification of Parkinson's patients vs. healthy speakers, and (2) the prediction of the neurological state of the patients according to the motor section of the Unified Parkinson's Disease Rating Scale (UPDRS). Recordings of three languages are considered: Spanish, German, and Czech. German and Czech data were provided by other researchers, and Spanish data were recorded in Medellín, Colombia, during the development of this work. Besides the classical approaches to assess pathological speech, a new method to model articulation deficits of Parkinson's patients is proposed. This new articulation modeling approach shows to be more accurate and robust than others to discriminate between Parkinson's patients and healthy speakers in the three considered languages.