

Video-based facial tracking for the assessment of motor speech disorders: Application to ALS

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The study of orofacial movements in motor speech disorders is conducted using expensive technology that limits the investigations to highly specialized laboratories. The recent developments in computer vision are offering a unique opportunity towards the development of cheap marker-less methods for studying facial movements. In this work, we investigate the role of lip kinematics in discriminating different stages of ALS, and the feasibility of studying facial movements using marker-less technology.

Lip movements from 64 patients with ALS were recorded with an optoelectronic method during a sentence repetition task. Kinematic features of lips (displacement, velocity, acceleration, jerk, area) were computed in order to classify data as pre-symptomatic/symptomatic of bulbar decline. Subsequently, the same features were estimated using a marker-less method (Intel® RealSense™ SR300 and Intraface algorithm) to discriminate patients with ALS (N=10) and healthy controls (N=10).

Results obtained with the optoelectronic methods, demonstrated that lip movements alone can discriminate different stages of bulbar decline in ALS with 86% of accuracy. Video recordings are still ongoing and full results obtained with the marker-less method will be presented during the conference.