Advancing AI for Disordered Speech: Assessment, Accessibility, and Articulation

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ABSTRACT

Speech is the most natural interface we have, yet millions of speakers with disordered speech are locked out of it. In this talk, we discuss how AI can unlock that door and transform the landscape via "3A-dimensions" of research (Assessment, Accessibility, and Articulation). First, we address Assessment, introducing reliable algorithms that provide clinicians with objective severity diagnoses. These methods offer data-driven insights to better track patient status. Second, we focus on Accessibility by developing privacy-sensitive learning algorithms to realize automated speech recognition (ASR) systems tailored to disordered speakers. This allows users to navigate a world increasingly dominated by voice-activated services and smart environments. Finally, we explore Articulation through Voice Repair technology, which transforms unintelligible or impaired speech into clear, natural-sounding audio while preserving the speaker's unique identity. By integrating clinical precision with functional communicative speech AI technology, this research aims to restore agency to disordered speakers, ensuring they are not only assessed and heard but understood in the modern digital landscape.