Automated Recognition of Autism Based on Visual Analysis with Artificial Intelligence Techniques

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Autism spectrum disorder (ASD) is a developmental disorder that affects communication and behavioral skills. People with ASD show atypical attention to social stimuli and gaze at human faces and complex scenes in an unusual way. It is crucial to detect ASD as early as possible to intervene in the possibility of a severe case, so this research developed an automated method to analyze the visual cues of autism using photos taken by people with ASD in comparison to photos taken by people without ASD in different scenarios. The key challenge is the characterization of the photos taken by people with ASD in order to facilitate an automated separation from people without ASD. Several features are proposed to characterize the observable behaviors for ASD with experimental validations, including photos with repetitive aspects, blurriness, tilted orientations, and unusual portrait photos. This is the first research work to perform an automatic analysis of photos taken by people with ASD and achieves a prediction accuracy of about 86%. More than just a good prediction accuracy, the proposed method can explain why ASD is detected based on the characterization. This promising result has great potential for early-stage recognition of autism on a large scale.

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