TOOLBOX

Computer vision may aid in screening for autism

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New algorithms can analyze recordings of infants performing tasks that gauge their attention, suggesting a way to automate the detection of autism symptoms. The results were published 22 June in *Autism Research and Treatment*[1].

Scientists already use video and tracking software to measure how children with autism **move around a room**. They can also **measure children's gait** — the way various muscles and joints align while walking — using a motion-capture system, or **monitor children's gaze** using cameras strapped to their heads.

To flag autism-related behaviors in young children, the researchers developed algorithms that measure the children's up-and-down and side-to-side motions by automatically tracking facial features such as the eyes, ears and nose.This allows the algorithms to evaluate children's performance on certain components of the Autism Observation Scale for Infants (AOSI) in parallel with a trained evaluator.

During the recorded test session, a trained evaluator performed such tasks as first shaking a toy in one hand and then another toy in the other hand and seeing how long it takes the child's attention to shift to the second toy. The evaluator also tested how well the child visually tracks an object as it travels through space. Difficulties with tracking objects or delayed reactions are indicative of autism.

The automated evaluation method agreed with the trained evaluator's judgments around 90 percent of the time. This is based on 12 children between 5 and 18 months of age.By contrast, untrained evaluators agreed with the trained evaluator 53 to 78 percent of the time, with a psychiatrist doing better than two psychology students.

The children were too young to receive an autism diagnosis as part of the study, so it is unclear how well the method fares for diagnosis.

The researchers aim to build on their work by developing software that analyzes infants' behavior as they interact with a tablet computer.They say these methods are unlikely to replace expert diagnosis, but may offer a relatively easy and inexpensive way for general practitioners or others who are not trained in autism diagnosis to screen for the disorder.These methods may also be useful for researchers who identify behavioral markers for autism by watching and scoring videos, a time-consuming task.

REFERENCES:

1. Hashemi J. *et al. Autism Res. Treat.* (2014) **Abstract**