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Celebrating invention, inspiring youth

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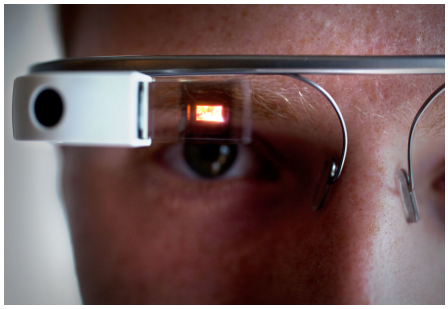
$15,000 Lemelson-MIT "Cure it!" Graduate Winner
Autism Glass Project



The Challenge: One of every 68 children in the United States is diagnosed with autism[1]. These children struggle to recognize facial expressions, make eye contact, and engage in social interactions. Gaining these skills requires intensive behavioral intervention that is often difficult to access and inconsistently administered. The current standard of care primarily consists of "flashcard therapy" involving painstaking memorization of emotions. As a result, many children with autism fail to build core social skills and regress down a path of isolation. While computer-assisted treatment systems have been studied for years, few strides have been made to bring the learning process away from flashcards and into the daily life of children with autism.

The Solution: Catalin developed an Artificial Intelligence system for automatic facial expression recognition that runs on wearable glasses and delivers real-time social cues to individuals with autism in their natural environment. The current beta device is a combined software and hardware system built on top of Google Glass. An individual wears the Glass device and the software system tracks expressive events in faces using the outward-facing camera and a machine learning system trained on thousands of samples of expression data, automatically recognizes social cues and provides this information to the wearer.

The device also connects to a "parent phone app" which automatically curates video data that has been recorded throughout the day, giving children and parents a chance to review some of the most expressive events of the day. Parents can review what possibly went wrong in a given situation.

Commercialization: The target group for the Autism Glass device tends to expend their health insurance on behavioral intervention programs at care centers. This group is looking for at-home treatment approaches that empower families with continuous care. Autism treatment is estimated to cost $268 billion in the United States this year and is expected to rise to $461 billion by 2025[2].

Catalin's vision is for this system to provide continuous behavioral therapy outside of clinical settings. This type of therapy enables dramatically faster gains in social acuity for children with autism and brings quantitative progress measures like eye contact to today's behavioral intervention programs. Ultimately, after a limited and self-directed period of use the child will no longer need to rely on the device.

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[1] http://www.cdc.gov/ncbddd/autism/data.html

[2] Leigh, J. Paul, and Juan Du. "Brief Report: Forecasting the Economic Burden of Autism in 2015 and 2025 in the United States." Journal of autism and developmental disorders (2015): 1-5.