PURDUE INNOVATES | Office of Technology Commercialization

Autism Eye-tracking Biomarkers

AI model using eye-tracking + clinician input to predict autism with 91% sensitivity and reduced diagnostic wait times.

Purdue researchers have developed an innovation for predicting autism in young children. The innovation combines biometric eye-tracking data, clinician impressions, and machine learning. The method focuses on the use of specific visual stimuli to elicit eye movements and pupil responses that correlate with known autism biomarkers, such as non-social preference or pupillary light reflex. The data from these eye-tracking responses is analyzed and processed through a model to produce an overall output prediction. This prediction is coupled with a clinician's independent diagnostic impression and input into a machine-learning algorithm to output one of three outcomes: potential autism diagnosis, no autism, or referral to a specialist. The developed method allows for a decrease in long diagnostic wait times and addresses disparities in access to autism specialists, particularly for underserved populations. The method shows high predictive performance, with 91% sensitivity and 87% specificity compared to a reference standard.

Technology Validation:

-146 children were provided usable data for eye-tracking measures

-A 90% consistent outcome when compared to reference standard diagnosis with 91% sensitivity and 87% specificity

-Classification and regression tree (CART) analysis was utilized for the machine-learning based diagnostic algorithm

Advantages:

-Decreased wait-times for autism diagnosis

-Greater access to diagnosis for children from minoritized backgrounds and underserved regions

Applications:

Technology ID
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Category
Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition
Digital Health & Medtech/Health Informatics

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View online

-Autism diagnosis

TRL: 4

Intellectual Property:

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