

# AI system uses MRI to diagnose autism in children as young as 24 months

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When it comes to autism, early diagnosis is key for effective intervention and support. Now, a newly created artificial intelligence (AI) system [has been found](#) to have the ability to diagnose children with autism between the ages of 24 and 48 months with a rate of 98.5 percent accuracy.

## DT-MRI scans used

The innovation uses a process that categorizes diffusion tensor MRI (DT-MRI) scans of the brain, which refers to a specialized technology that detects how water moves along white matter tracts in the bodily organ.

“Autism is primarily a disease of improper connections within the brain,” said co-author of the new paper Gregory N. Barnes, M.D., Ph.D., professor of neurology and director of the Norton Children’s Autism Center in Louisville.

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The AI technique works by collecting imaging signals that show the strength of the connection between various brain areas. These are identified through the use of DT-MRI scans that allow researchers to isolate brain tissue images. A machine learning program then proceeds to compare marker patterns in autistic children's brains to those in properly formed brains.

For the study, the research team used DT-MRI brain scans acquired from the Autism Brain Imaging Data Exchange-II. The data library contained scans from 226 children aged 24 to 48 months, 126 who were autistic and 100 who were not. The AI system was found to identify the scans belonging to children with autism with 97 percent sensitivity, 98 percent specificity, and an overall accuracy of 98.5 percent.

## Better outcomes

“Our approach is a novel advancement that enables the early detection of autism in infants under two years of age,” Mohamed Khudri, B.Sc., a visiting research scholar at the University of Louisville in Kentucky behind the new invention, said.

“We believe that therapeutic intervention before the age of three can lead to better outcomes, including the potential for individuals with autism to achieve greater independence and higher IQs.”

The system based on advanced algorithms will now allow for much earlier diagnosis compared to the average three years of age currently being achieved by healthcare professionals. According to the researchers, newborns and young children with autism are delayed in receiving a diagnosis for a variety of reasons, including a shortage of bandwidth at testing centers.

“Imaging offers the promise of quickly detecting autism in an objective fashion,” Dr. Barnes said, adding that the new method could lower the workload of psychologists by up to 30 percent.

In addition to providing earlier diagnosis, the new system will lower diagnostic and treatment time and expenses by generating a report that includes information on which neural circuits of the brain are affected, the expected impact on brain functionality, and a severity rating that may be used to guide early medical intervention.