



NEUROGAZE: A technological aid looking to assist clinicians in day to day work toward diagnosing ADHD in a more efficient and proactive way

Objective

Develop and test a system that uses eye-tracking technology and AI to identify eye movement patterns that could assist in diagnosing Attention Deficit Hyperactivity Disorder (ADHD).

Summary

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental condition affecting attention & impulse control. Traditional ADHD diagnosis relies on subjective assessments. My project, NeuroGaze, aimed to develop a prototype system that uses eye-tracking technology and AI to detect ADHD-related eye movement patterns, offering a more objective approach for earlier diagnoses of ADHD.

I conducted a thorough investigation by gathering background information, analysing data on ADHD and eye tracking. Following up I consulted healthcare professionals to gain an informed perspective. I conducted one survey with 700 respondents. Next with this data, I developed a web application, built with code, which would allow users to upload their gaze data, visualise attention metrics, and compare results to known ADHD patterns. This prototype has the potential to assist clinicians, detecting early signs of ADHD, reducing diagnostic delays, and enabling prompt interventions. By combining eye-tracking technology, artificial intelligence, and accessible web-based tools, NeuroGaze is a step toward more objective, scalable, and data-driven ADHD screening

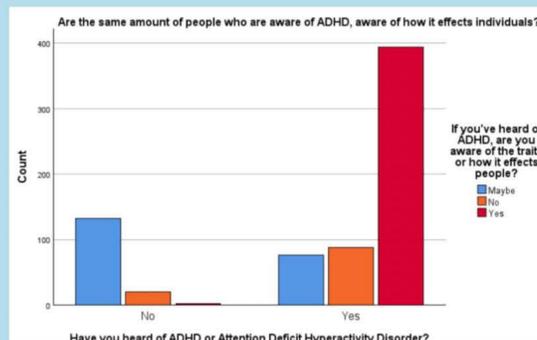
Methodology

I began by researching on this topic, diving into information about ADHD, eye movement patterns, AI and eye tracking. I followed this up with a survey of 713 participants, followed by conducting interviews with health professionals to get a public and professional input into my app development.

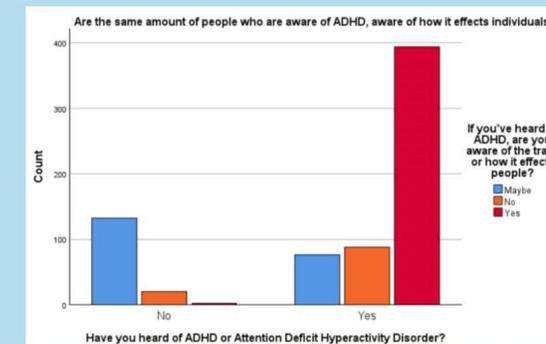
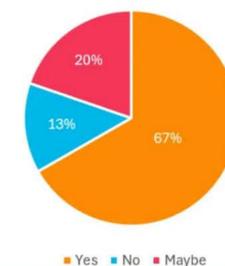
My findings highlighted that for professionals to take on my app and trust the AI it needed to be a simple layout and have a strong privacy wall and this was what my application is strongly based on.

Later, I developed my prototype for my app via HTML and following this I created and coded my own, stronger and more reliable web application for NeuroGaze heavily based on my previous prototype.

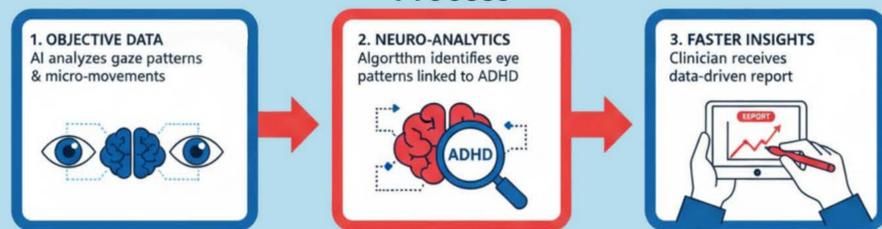
Data



If you've heard of ADHD, are you aware of the traits or how it effects people?



Process



Further Research

Looking ahead, I intend to connect my application to medical records for those who would use this in diagnoses. Having direct connections to all medical/diagnosis records could have a positive impact on clinicians, making it easier to have objective and subjective tests grouped together. My goal is to develop a comprehensive and reliable application that can be integrated into the clinical diagnostic process.

In the future, I hope to collaborate closely with health professionals in this area to refine and implement this tool, making it a lasting addition to the methods used for more exact and earlier diagnosis.

Finally, I wish to explore its use for detecting other neurodevelopment or attention-related disorders beyond ADHD and shorten other diagnosis processes to help as many people as I possibly can.

Results & Conclusions

In conclusion, implementing my application could add an incredibly useful tool to shorten the diagnosis process of ADHD.

Through this tool clinicians gain evidence-based diagnostic support rather than the traditional methods which are more subjective with things such as teacher reports, behavioral checklists, and self-assessments.

Professional experts defined the need for objective diagnosing since the present diagnostic methods display inconsistent results which demand a long assessment process.

The ADHD diagnostic system NeuroGaze demonstrates great potential as a clinically advanced tool which provides both secure and efficient means to detect and treat the disorder. Technology that supports clinical requirements shows promise to enhance results for patients who have ADHD.

Value Proposition

NeuroGaze offers a faster, more objective approach to ADHD screening. By detecting attention-related eye movement patterns, reducing reliance on lengthy, subjective diagnostic processes.

About Me!

My name is Erin Mills, I am a 17-year-old 5th year student attending St. Mary's College Arklow, Wicklow. I started this project this January and I'm proud 'Best Project Winner' at the SETU Waterford Scifest competition this past May.