

Highly Commended

Computer Programming, Apps & Robotics

Year 5-6

Saheli Dissanayake

Seymour College







Can you be a victim of Alzheimer's Disease?

A cognitive assessment tool for Alzheimer's Disease



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Introduction

Alzheimer's Disease is a progressive disease which slowly destroys brain and memory functions. It is a form of dementia. Every three seconds, one person across the globe develops a form of dementia. Alzheimer's Disease is the most common form of dementia. Alzheimer's Disease affects people all over the globe. The more amyloid beta a patient accumulates, the harder they find it to complete daily activities like finding keys.

1 in 10 Australians above 65 years old

have some form of dementia

I have developed a tool with a quiz for anyone to complete to see if Alzheimer's Disease is something which could affect them in the long run. Once answering all the questions, the platform tells the user whether or not Alzheimer's is going to be something which could affect them as of now.

Aim of entry

The aim of my entry is to develop a cognitive assessment to determine whether an individual can be a victim of Alzheimer's Disease. There is currently no cure for Alzheimer's Disease which means the best way around it is to try hard to prevent it when a person is younger rather than waiting until they are at the age when Alzheimer's Disease gets serious. Ways to prevent Alzheimer's Disease include stimulating your brain, keeping a healthy lifestyle and seeing if a person is prone to Alzheimer's Disease to see how much a person should worry about it. As such, the platform I developed is based on research findings to help a person to know if the individual is prone to Alzheimer's Disease and also gives a person tips on other Alzheimer's Disease preventing actions.

Scientific purpose

If you look at how Alzheimer's affects a patient, the synapse is where Alzheimer's is affecting your memory and brain functions. The synapse is where neurotransmitters are released, where signals are transmitted, where communication happens. It's the component of the brain which helps to see, think, hear, feel, desire and remember.

In addition to releasing neurotransmitters like glutamate into the synapse, neurons also release a small peptide called amyloid beta. Normally, amyloid beta is cleared away metabolized by microglia, the janitor cells of our brains. While the molecular causes of Alzheimer's are still debated, most neuroscientists believe that the disease begins when amyloid beta begins to accumulate. Too much is released, or not enough is cleared away, and the synapse begins to pile up with amyloid beta. And when this happens, it binds to itself, forming sticky aggregates called amyloid plaques. Due to this high amyloid plaque and amyloid beta, Alzheimer's Disease develops. This means that amyloid beta causes your memory to slowly destroy and brain functions. With that in account, we can ask questions to determine your brain and memory functions and use that to.

This early detection tool is a computer based cognitive assessment that can detect cognitive changes and can be useful in the early detection of Alzheimer's Disease. The cognitive assessment tool uses predictor variables which determine cognitive impairment.

Potential applications

My application can be used by any individual who wants to undertake a cognitive assessment to determine whether they are prone to Alzheimer's Disease. This can also be used in aged care facilities, scientists or research groups. It can also be used for educational purposes in learning environments for students to understand the cognitive impacts of Alzheimer's Disease and to keep them aware of it for when they are older.

Using the program

- 1. Using a web browser go to <u>alzheimersfind.online</u>
- 2. Read the information on the page about Alzheimer's Disease to acquire more knowledge and understand cognitive impacts.
- 3. Click on the 📜 button to take a cognitive assessment test.
- 4. See the results of the cognitive assessment after answering the questions.

Program components

This program has been developed using JQuery, HTML5, Bootstrap, Java, JavaScript and Scratch. The cognitive assessment tool is hosted at the above URL. JQuery, HTML5, Bootstrap, Java and JavaScript are used to code the website and to hold the information on the disease, tips and cognitive impacts. The cognitive assessment tool is developed using Scratch and is embedded into the webpage using Java.



Figure 1 - landing page containing disease information, tips and cognitive impacts.





Figure 2 - code which runs the website.



Figure 3 - programming logic of the cognitive assessment questions and criteria.



Figure 4 - programming logic for the cognitive assessment results based on research findings.

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