



Task One

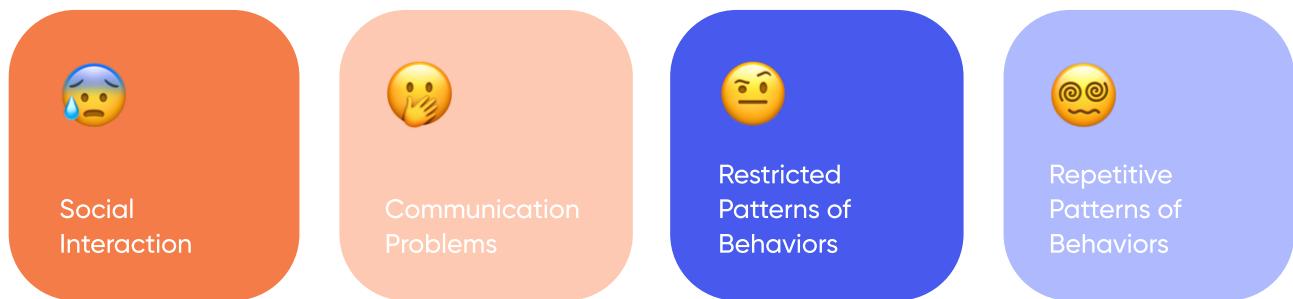
research & investigation

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Research, Purpose & Impact

According to the latest data & statistics from the [Centers for Disease Control and Prevention](#) on the topic of **Autism Spectrum Disorder** about "1 in 54 children has been identified with autism spectrum disorder" as of 2016. This is quite a high probability of a child to be diagnosed with this disorder. What is autism spectrum disorder you may ask? As per [Nathan Copeland](#) (2018) it is a "**complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted/repetitive behaviors**".

Characteristics



In essence this includes "**difficulties in normal back-and-forth conversation**, reduced sharing of interests or emotions, challenges in understanding or responding to social cues such as eye contact and facial expressions, deficits in developing/maintaining/understanding relationships (trouble making friends), and others". As well as "**having significant need for a predictable routine or structure**, exhibiting intense interests in activities that are uncommon for a similarly aged child, experiencing the sensory aspects of the world in an unusual or extreme way".



These characteristics will be the driving force for the features I will implement within my application. As well to bring awareness to this disorder and create an application specifically for them.

AI Technology

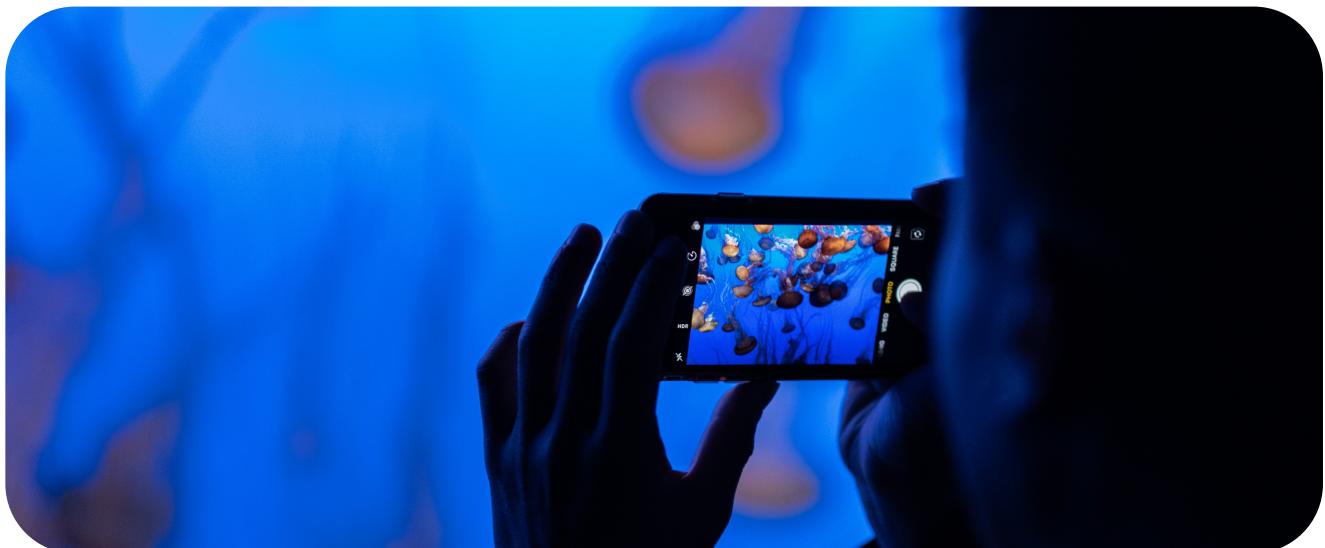


In terms of the AI technology I want to incorporate into my project, I conducted research on how my project can have a positive social impact. As mentioned in the research I want to use the characteristics as features within my application. One of the characteristics is that a person with ASD, struggle with expressing emotions and looking for social cues. Therefore integrating a **text-to-speech** which is built into iOS namely, **AVSpeechSynthesizer, with AVSpeechUtterance, and AVSpeechSynthesisVoice**. Where the user can type what they want to say and how they feel to the other user in a conversation. Further implementing and using the Vision framework from Apple themselves for **text-recognition** if the user struggles with reading comprehension this would assist them and extract text from an image they scanned.

Lastly I would want to make use of **Alan.ai** which is an **AI driven voice assistant** that you can integrate right into iOS Swift Apps. According to an article by Mark Walker (2017) he stated that the use of "an assistant like Alexa or Siri makes communicating very straightforward for someone with autism. They don't have to contend with trying to understand nuanced body language, facial expressions, moods or the million-and-one other things that can be happening every time we talk to someone". Essentially people with ASD tend to like to be in control when communicating or taking part in a conversation. This is why Alan.ai's voice assistant would be integrated to navigate between views using their voice commands.

Product Type

For the product type of my project I would want to create an **iOS SwiftUI mobile application, alongside a website**. The main reason for building a mobile application for this specific topic and concept is that as stated by WebsiteBuilder in 2021 the statistics show that were "218 billion app downloads in 2020" (statistics from Statista). This shows the importance of mobile applications. Further according to Autism Speaks assistive technology "can be used to support and enhance communication for people with autism, regardless of speech ability ", hence mobile application.



For the website part of the project I want to use the website as more of an information library for further details about the application. Where the user can log in with the same details as on the mobile app and have a personalised dashboard for them. This is still a thought whether this is necessary, but implementing a website showcases more of the skills I have.



Mobile application would be crucial for when having conversation interactions, they app would be needed to assist the user (specifically a ASD user).

Development Technology

For the development technology my AI integration work seamlessly with iOS, specifically the text-to-speech and text-recognition as they are built by Apple themselves. This would mean using these technologies would be optimised and user-friendly.

-  **Mobile Application**

For the mobile application the technologies would be **Swift** and **SwiftUI**.



-  **Website**

For the website the technologies would be the use of **HTML**, **CSS**, **JavaScript**.



Linking both the Mobile Application and Website with a **Firebase Firestore** database of information and data. Alongside **Firebase Authentication** for the sign in and sign up of users to the application.



Features & Functionality

For the features and functionality it would be all centered around one persona which is a person with ASD. The application features and functionality would be catered specifically to this target audience.

- **Features**

- Custom UI for autistic audience
- Subtle animations
- Profile screen to edit user details signed in
- Custom emotion expression with emojis.
- Accompanying website for app
- Calming colour palette
- Simple easy to understand UI
- Custom onboarding screen designs
- Responsive app design

- **Functionality**

- Secure Firebase Sign In & Sign Up.
- Reset password functionality on mobile
- Custom text-to-speech integration
- Emotion expression through speech.
- Scan objects to extract text
- Improve communication skills section.
- Using a custom voice assistant to change views.
- Onboarding screens for app
- Meditation timer feature.



Thank you for reading my task one research and investigation document. Any suggestions would be appreciated.