# Apple Scholarship 2022

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## Did you use any open source software?

> Yes

One of the open-source pieces of software I used was a package called SlideOverCard, created by João Gabriel, which gave me the functionality of UIKit's UISheetPresentationController but in SwiftUI. I tried using a custom implementation of the class in SwiftUI, but I couldn't quite figure out how to make it stateful. I also tried using the built in .popover function, but I was also having a few issues with that, including customisability and UI updating issues. Eventually, I found this package, which seemed to solve most of my problems with state while providing a clean popover for my menus. The code for this package is stored locally inside the "SlideOverCard" folder, including the license provided on GitHub which allows for commercial use, modification, distribution and private use.

I also used a few public domain images and texture maps, which allowed me to create a universe background and have planet textures for those planets in the Solar System. These images are from 3 different websites, as sourced at the top of "SolarScene" file, all with the appropriate rights and licenses for use in this project.

## Tell us about the features and technologies you used in your app project.

When I was younger, I discovered a website called Chaotic Planets, which demonstrates the emergence of chaos theory in the stars, using a playground-like

website to develop an understanding of Newtonian Gravity. This website stimulated my 8-year-old brain to no end, not only inspiring awe at the beauty of these stable orbits, but also giving me a strong baseline understanding of physics by encouraging play and curiosity, which drove me to my current love of programming I have today.

With this year's Swift Student Challenge, I looked back at what first got me into STEM, utilising the help of Apple's various technologies and platforms to bring back that wonder to a new stage for others to experience. This year I adopted SwiftUI for the first time, allowing me to create a sleek and intuitive user interface with surprising ease. This was combined with the new Swift Playgrounds App Project format, which was an interesting change. At first, I didn't quite like this combination, as everything felt very foreign and different, with some initial setup and getting used to. After settling into this new format though, I found that I thoroughly enjoyed the ease of use of SwiftUI, and how everything (almost by default) looks really nice, like a proper iOS app. The new app format was also much appreciated, as we now get to create an actual *app.*

Another technology I used was SceneKit, which enabled me to create 3D physics simulations, powering the main element of my app, the Newtonian Gravity Simulation. This was my first venture into 3D graphics, so it was very fun creating a fluent interop between SwiftUI and SceneKit, allowing for the visualisation to feel all the more real and responsive. I also used ARKit, which brought my pre-existing scene to life in the real world, a feature I loved. Finally, I used Combine to help with user input validation. Overall, I greatly enjoyed using various Apple technologies to build up my app, creating a user experience that is flexible and engages a wide audience.

# Beyond WWDC22 (optional)

> If you've shared or considered sharing your coding knowledge and enthusiasm for computer science with others, let us know.

My love for programming started quite young, entering into a robotics competition in Grade 3, creating VEX IQ robots. Throughout this process, I found that I actually enjoyed programming the robots more than I did building them, which led me to learning my first programming language, C. This inspired me to get into game development with GameMaker Studio 2, which uses a language extremely

syntactically similar to JavaScript, leading me to the whole wide world of web development, creating websites, games and various other small experiences, such as the Galton Board simulation my previous SSC submission was based on. Overtime, as I became more passionate about the topics I delved into, I started sharing my knowledge with others around me by holding small Python and Web Dev classes with my friends and family, teaching them everything I learnt on the internet. I held these classes almost weekly, covering an array of topics and projects. At the start of last year, I got my first MacBook, which allowed me to properly get into app development! I'd dabbled in creating apps a tiny bit before (my first app was a birthday present to one of my friends in Flutter a few months prior), but nothing serious. This was *just* before last year's WWDC scholarship, and I'm grateful to say that I got it! This opened a world of opportunities for me, allowing me to create my first app on the app store, holding workshops across schools to teach them about cryptocurrencies, meet fantastic new people and much much more. By sharing my passion and knowledge with my friends over the past year through various phone calls, lunchtime sessions and random projects, I even managed to convince some of them to apply for the SSC this year, which will be a great experience. As of now, I run a maths club with fun math questions to stimulate the students of our school, along with various programming competitions and events to make this wonderful field more accessible to everybody.

# Apps on the App Store (optional)

> If you have one or more apps on the App Store created entirely by you as an individual, tell us about them. This will not influence the judging process.

Thanks to last year's SSC, I was able to create The Nova System, an app that mimics cryptocurrency transactions to help people learn without spending. I engineered the idea with the assistance of two of my friends. Personally, I created and programmed the app, while the marketing and educational side were handled by them. Together, we used the app as a tool to formulate various workshops around the school, teaching students about cryptocurrencies, the economy overall, and how to be safe in a new digital age. These workshops were greatly successful, with some teachers helping us get in contact with prospective investors which will hopefully help get the idea further to more classrooms.

As a holiday project, I also created Verdis Communications, an internal government communications app for Verdis. I was introduced to it by a mutual friend, who works for a small unrecognised micronation called Verdis, and I was asked if I would be able to create a communications app for their group. I happily took on the project, creating a texting, video calling and blogging solution packaged as an iOS and Android app. It was quite a fun project, and it’s greatly rewarding to see people actually use and enjoy something you made.

Both these apps have been created with the Flutter framework, to enable cross platform development. This has been my first proper venture into native app development, and I especially liked SwiftUI for how nice the resulting apps can look with minimal effort. I love bringing new platforms to people. Solving issues and using technology to aid in everyday human problems is what drives me, so I hope to venture into more native app development in the future and utilise these Apple technologies to build fun, engaging and exciting platforms that help ordinary people like me.