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Personal Statement

I am Suther David Samuel, a Year 3 Computer Engineering undergraduate from National University of Singapore (NUS). As part of the NUS Advanced Technology Attachment Programme (ATAP) I am seeking to secure a 6-month long credit bearing internship in a computing related role from Jan 2021 to June 2021.

About me

My passion for computing began in junior college where I first learnt web and android development in Tech Council CCA. I was selected to become the Vice-President of the CCA and I have organized a hackathon for the school. I enjoyed working with my CCA friends to tackle problems by building web-based solutions for the school. While I enjoyed software development, I also wanted to learn how computers work on a low level and this led me to where I am now, pursuing a bachelors in Computer Engineering.

Now, my main interest is software development as it gives me a sense of accomplishment when I see the finished project. I feel that it empowers me to create solutions to various problems and allows me to make a difference. However, I'm also actively exploring other fields of computing such as data analytics and cyber security to quench my interest and expand my knowledge base. As such, I'm keen in seeking opportunities that will challenge me and teach me new skills.

Technical Skills

I am well versed in both hardware and software engineering. I have worked extensively on projects with Arduino, Raspberry Pi, RPLiDAR, Basys3 and Cortex M3. I have a basic understanding of computer architecture and I'm comfortable with working with languages such as Verilog, Arduino, bare metal C++, FreeRTOS and Assembly.

I have also worked on numerous software projects. I'm familiar with Node.js, PostgreSQL, React, JavaScript, PHP for web development. I have developed several android applications with Java in Android Studio and one of my application has more than 500 downloads on the Playstore. I have used JavaFX to create desktop applications and in my software projects, I have learnt to adopt good software engineering principles such as version controlling and writing documentation.

Recently, I have started to explore artificial intelligence, data analytics, web application security and cloud technology to broaden my knowledge. I have implemented AI algorithms such as A* search, AC-3 and Reinforcement learning in python to solve 8-puzzle, Sudoku and Pacman respectively. I'm learning machine learning libraries such as Tensorflow, Scikit-learn, and working on projects to hone my data analytics skill set.

Work Experience / Start-Up Experience

After completing national service, I joined Zenitnant Pte Ltd as a Robotics Trainer. Even though I had no prior experience with Arduino or Micro:bit, I was able to pick up very quickly and eventually conduct lessons for class sizes of 40 students confidently. This was also when I realized that I enjoyed teaching.

I then went on to give private tuition for more than 10 secondary school students in math and science subjects while also juggling university. This taught me excellent time management skills and I was able to hone my interpersonal skills at the same time. My most fulfilling experience during this journey was guiding and inspiring an O Levels student who was failing his math and science subjects to eventually attain distinctions within a span of mere 8 months.

After a year in Computer Engineering, I joined my friends in founding an edutech startup named CoduE. We wanted to create an autonomous E-Learning platform to introduce programming to kids as young as 9 to 14 years old. We went on to win the I&E Practicum@SOC award and with the grant we kick started our development. Initially, I was in charge of the content creation for our platform. However, being part of a small start up also required me to play all sorts of other roles such as marketing, digital content creation, search engine optimization and software development which I enjoyed the most. As we are approaching the end of development phase, I am seeking new software development or computing related internship opportunities to learn, challenge myself and contribute to companies.

Education

- | | |
|---------------------|---|
| Aug 2018 - Present | National University of Singapore Bachelor of Engineering (Honors) in Computer Engineering CAP: 4.54/5.0 (Course details in Appendix A) |
| Jan 2014 - Dec 2015 | Anglo-Chinese Junior College <ul style="list-style-type: none">• Singapore-Cambridge General Certificate of Education Advanced Level• Subjects: H2 Physics, H2 Chemistry, H2 Mathematics, H2 Economics, H1 Project Work, H1 General Paper |

Work Experience

- | | |
|---------------------|--|
| Aug 2019 – Present | CoduE <i>Co-founder</i> <ul style="list-style-type: none">• Developed entire education content, designed novel pedagogy from scratch to introduce programming to young children• Integrated a multiplayer 2D game with the main education platform and database• Performing integration and system testing to ensure game platform works seamlessly with the main platform |
| May 2020 – Present | National University of Singapore <i>Advisor – CP2106 Independent Software Development Project</i> <ul style="list-style-type: none">• Supervising and guiding 5 teams to complete their self-initiated software project during summer• Evaluated teams' progress for each milestone and ensured adherence to good software engineering practices |
| Feb 2018 - May 2018 | Zenitant Pte Ltd <i>Robotics Trainer</i> <ul style="list-style-type: none">• Introduced Arduino and Micro: bit to secondary school students as part of their enrichment classes• Nurtured students' interests in robotics by encouraging them to build their own robot systems to solve Agenda 21 issues |
| Feb 2018 - Present | Elite Tutors <i>Private Tutor</i> <ul style="list-style-type: none">• Guided more than 10 students up to date through their GCE O Levels Examinations in E/A Mathematics, Pure/Combined Chemistry and Physics• Created notes for every chapter and personalized assessments to understand students' areas of weakness• Cultivated students' interest in learning and designed higher order thinking questions to challenge them• Received positive reviews and have been recommended by students' parents |
| Feb 2016 – Feb 2018 | Singapore Armed Forces, 3rd Army Maintenance Base <i>Supply Specialist</i> <ul style="list-style-type: none">• Trained and led more than 20 supply assistants to ensure smooth logistics flow for various conducts• Prepared unit for annual commercial stock takes and logistics audits |

Computing Projects

| | |
|------------|--|
| Apr 2020 | AI Algorithms to solve 8-Puzzle, Sudoku, Pacman <ul style="list-style-type: none">• Implemented A* search with Euclidean distance and linear conflicts as heuristics to solve 8-puzzle game• Implemented both AC3 and forward checking algorithms to solve Sudoku puzzles and compared their efficiencies• Implemented reinforcement learning to train Pacman to win |
| Nov 2019 | Mock Carpool Web Application <ul style="list-style-type: none">• Developed a mock carpooling system using node.js with relational database implemented with PostgreSQL• Allowed drivers to advertise rides and passengers to bid for rides• Implemented inbox to allow for drivers and passengers to communicate• Implemented priority matching of passengers and drivers with common song preference |
| Nov 2019 | Ducats – Music Theory Education App <ul style="list-style-type: none">• Worked in a team of 5 to develop CLI application in Java to allow amateurs to learn music theory• Programmed the display for sheet music and allowed users to group and overlay parts of music they write• Performed extensive software testing with JUnit |
| Aug 2019 | Parkevelution – One stop solution to all your parking problems <ul style="list-style-type: none">• Developed an android application that provides real time parking lot availability, parking rates and nearest carparks to a location• Also recommends carpark based on different parameters and predicts future lot availability based on historical data that's stored on a database hosted on a Raspberry Pi Server• Available on Playstore |
| March 2019 | Basys3 Audio Visualizer <ul style="list-style-type: none">• Programmed a Basys3 FPGA in Verilog to visualize audio in 10 different ways with the ability to mix and overlay different visualizations• Programmed moving text on 7SEG display corresponding to audio intensity• Developed a simple space battle game playable voice intensity |
| March 2019 | Remote Operated Search and Rescue Robot <ul style="list-style-type: none">• Built a search and rescue robot with Arduino, Raspberry Pi, RPLiDAR• Built and calibrated IR and color sensor circuits• Wrote packet transfer codes for communication between Arduino and Raspberry Pi in C++ |
| Nov 2018 | mBot Maze Navigator <ul style="list-style-type: none">• Programmed an mBot in Arduino to navigate and sense obstacles in a maze• Built and calibrated color detection circuit with LDR• Built low pass and band pass filters with op-amps to distinguish low and high frequency sounds. |
| Jan 2017 | A Levels Rank Point Calculator <ul style="list-style-type: none">• Developed an android application to calculate students' rank points and display eligible courses in local universities• Used beautiful soup to web scrape IGP cut off for local university courses• Available on Playstore with over 500 downloads |

Skill Sets & Proficiency

| | | |
|---|---------------------|--------------|
| Programming Languages | Python | Proficient |
| | Java | Proficient |
| | C | Proficient |
| | C++ | Proficient |
| | JavaScript | Proficient |
| | Verilog | Intermediate |
| | FreeRTOS | Intermediate |
| Data Analytics/ Machine Learning | Pandas | Intermediate |
| | Tensorflow | Basic |
| | Scikit-learn | Basic |
| Web | HTML5 | Proficient |
| | CSS | Intermediate |
| | Node.js | Intermediate |
| | React | Intermediate |
| | PHP | Intermediate |
| | PostgreSQL | Proficient |
| | Bootstrap | Intermediate |
| Testing | Junit | Intermediate |
| | Selenium | Basic |
| Hardware | Raspberry Pi | Intermediate |
| | Arduino | Proficient |
| | Cortex-M3 | Basic |
| | Basys3 | Intermediate |
| Others | Git | Proficient |
| | Linux | Intermediate |
| | Android Studio | Proficient |
| | MS Office | Proficient |
| | Adobe Photoshop | Intermediate |
| | Adobe Premiere Pro | Intermediate |
| | Adobe After Effects | Intermediate |
| | Unity Game Engine | Basic |
| Written and Spoken Languages | English | Fluent |
| | Tamil | Fluent |

APPENDIX A

Degree: Bachelor of Engineering (Honours) in Computer Engineering
 Minor in Financial Mathematics
Cumulative Average Point: 4.54 / 5.00

| Category | Course Description | Grades |
|--|--|--------|
| Computing Fundamentals | Programming Methodology | A- |
| | Programming Methodology II | A- |
| | Effective Communication for Computing Professionals | S |
| Engineering Fundamentals | Engineering Principles and Practice I | A- |
| | Engineering Principles and Practice II | A- |
| | Engineering Professionalism | A- |
| Software Development | Software Engineering & Object-Oriented Programming ^ | A |
| | Independent Software Development Project (Orbital) | CS |
| | Database Systems | B |
| Algorithm and Theory | Discrete Structures | A- |
| | Data Structures and Algorithms | B |
| Computer Organization and Architecture | Digital Design | A |
| | Real-Time Operating Systems | A |
| | Transistor-Level Digital Circuits | A |
| | Computer Organization | A- |
| | Signals and Systems | A- |
| Artificial Intelligence | Introduction to Artificial Intelligence | S |
| | Introduction to Machine Learning with Python | CS |
| Game Development | Introduction to Game Development with Unity | CS |
| Mathematics | Engineering Calculus | A- |
| | Differential Equations for Engineering | A- |
| | Linear Algebra for Engineering | A |
| | Probability and Statistics | A- |
| Electives | Living with Mathematics | A- |
| | Quantitative Reasoning | B+ |
| | Asking Questions | CS |
| | Cyber Security | A |
| | Managing Singapore's Built Environment | A |

The **Independent Software Development Project (Orbital)** allows year 1 undergraduates to form a team of 2 and create any project during the summer break. It is an independent project and thus, students are required to do their own research and self-study. Me and partner developed an android application (Parkevelution) with Android Studio and Java to solve parking problems in Singapore.

^ The **Software Engineering** module introduces the necessary conceptual and analytical tools for systematic and rigorous development of software systems. It covers four main areas of software development, namely object-oriented system analysis, object-oriented system modelling and design, implementation, and testing, with emphasis on system modelling and design and implementation of software modules that work cooperatively to fulfil the requirements of the system. Tools and techniques taught include Unified Modelling Language (UML), program specification, and testing methods.

NUS Grading Scale:

A+ & A (5.0); A- (4.5); B+ (4.0); B (3.5); B- (3.0); C+ (2.5); C (2.0); D+ (1.5); D (1.0); F (0)

S = Satisfactory; U = Unsatisfactory

CS = Completed Satisfactorily; CU = Completed Unsatisfactorily

EXE = Exempted; IC = Incomplete; IP = In Progress; W = Withdrawn