ALVIN **TAN**

SOFTWARE DEVELOPER | C++ | CYBERSECURITY

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ABOUT ME

Searching for opportunities where I can utilize and develop my problem-solving and analytical skills to implement efficient solutions and to expand my knowledge in the field.

Interested in developing my skills in C++, Cybersecurity and Music!

EDUCATION

(BSc) Computer Science in Real-Time Interactive Simulation | DigiPen SG
SEP 2016 – DEC 2019

- Dean 's Honor List – Fall 2018, Spring 2019

Software development, real-time simulations, and game development

(DipBM) Business Management | Nanyang Polytechnic
APR 2011 – MAY 2014
Specializes in Supply Chain Management

Certifications

- Offensive Security Certified Professional (OSCP) **by Offensive Security**
- Deep Learning Jumpstart Workshop **by SGInnovate and Red Dragon AI**
- Principle and Engineering of Secure Solutions **by SGInnovate and Teagasus International**

EXPERIENCE

Core Engineer | Zilliqa Research
JUN 2020 – CURRENT

- Design, develop, test and deployment for Zilliqa's core blockchain protocol (open sourced)
- Perform bug fixes and resolve issues on multiple codebases
- Participate in maintenance, upgrading, monitoring, and patching of the on Zilliqa's mainnet

Software Engineer (Cryptography) | ST Engineering
APR 2021 – JUN 2021

- Build C++ software component for a particular cryptographic hardware

Cyber Security Engineer | ST Engineering
MAR 2020 – APR 2021

- Administering and maintenance of a lab system for training purposes
- Assisting in creating scenarios for training purposes e.g., creating malware simulation

Software Engineer | Axinan
NOV 2019 – FEB 2020

- Built internal tools that locally sandbox multiple services with shared services such as database for testing and debugging
- Assisting on third-party data verification and processing to sync up databases

Jr. Software Engineer | Fissionworks | SGInnovate Summation Programme
MAY 2019 – NOV 2019

- Built SaaS products in the role as a backend engineer using Go and Amazon Web Services
- Implemented business logic, build APIs and integrating Stripe for payment services
- Assisted in a secure multi-party computation project (C++) to compute data without revealing any third-party data using Google's Private Join and Compute

Teaching Assistant | DigiPen Institute of Technology Singapore
SEP 2017 – AUG 2019

- Held lab sessions for programming and game project modules
- Grading of assignments and quizzes

Sea Freight Intern | DHL
SEP 2013 – OCT 2013

- Assisted and shadowed in the daily operations of a Sea Freight senior employee such as handling invoices and processing them

SKILLS

C/C++

- Created game engines from scratch with C/C++ for both 2D and 3D
- Implemented a Memory Manager and ADT such as Binary Tree, AVL Tree and Hash Table
- Knowledge in low-level optimization techniques
  - Implemented a simple square root program using assembly programming
  - Spatial and temporal locality to speed up a program (cache-friendly code)
  - Techniques for optimization – Parallel accumulators, loop unrolling and SSE SIMD
- Implemented multithreaded programs with concurrency knowledge to prevent data race

Python

- Self-taught, able to implement mathematical algorithms e.g., cubic splines and linear regression
- Made connect4, 2D shooter and an interactive directory map (NumPy and Pygame)

Go

- Implemented business services as a backend developer using Echo, Docker, Amazon Web Services, Stripe, MySQL and Redis

C++/CLI and C#

- Wrote a wrapper to call unmanaged C++ code from C#
- Successfully implemented a Hotel Guest Management System (UWP C# app) in few hours

A.I. / Machine Learning / Deep Learning

- Implemented path-finding algorithm such as Dijkstra's algorithm and A* search algorithm
- Implemented kNN Algorithm, Multivariable Linear Regression with Gradient Decent, kMeans and a neural network for XOR problem with multiple weight initialization
- Implemented transfer learning for a particular dataset using Keras API for TensorFlow
- Knowledge in general deep learning techniques and models

CUDA C/C++

- Optimizing code with CUDA programming with techniques with both hardware and algorithms
  - Shared memory (privatization), memory configuration (pinned, unified, texture)
  - Convolution techniques and parallel computation algorithms (reduction/scan)

Network Programming

- Socket Programming (Winsock – TCP/UDP)
- Implemented server/client application for file transfer and network game application with cheat prevention protocol such as Lockstep protocol and Bucket sync

Others

- OpenGL for 2D and 3D graphics programming and techniques for real-time rendering
- ImGui/AntTweakBar for GUI based program

Miscellaneous

- Operating System – Windows / Linux
- Source Control – Git / SVN
- Game Development – Custom Engine / Unity
- Containerization – Docker
- Cloud Services – Amazon Web Services / Google Cloud Platform

PROJECTS

Scrap Mettle | Game Project Year 3 | Winner – Game of the Year (2nd)

- Implemented Command System Framework, Modular Performance Profiler and Collapsible Logger
- Integrated of AngelScript and C# (Mono) as scripting language

CUDA Fractals | GPGPU Project (On GitHub)

- Implemented fractal algorithms with CUDA programming

Adventure Learn | SIT Project | Winner – Best Visual and Software Architect

- Gamify survey taking into an app which tracks student's progression and learning traits

Manawa | Game Project Year 2

- Revamped and optimized game engine architecture to reduce coupling within systems and improve frames per second for the overall gameplay
- Created tools for designers (undo-redo, multi-select and other QoL tools)