Zhuo Ying Jiang Li

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Education

King's College London, London, UK   09/2019 – 06/2022 (expected)

BSc Computer Science: *Information Security, Cryptography, Operating Systems, Internet Systems, Compilers, Foundations of Computing (Maths), C++ for algorithms and data structures, Optimization Methods, Artificial Intelligence*

IES Son Pacs, Balearic Islands, Spain   09/2017 – 06/2019

International Baccalaureate, Grade: 45/45, Extended Essay (Maths): A

Selected Projects

Regular expression matcher: A regular expression matcher using Brzozowski algorithm   09/2021

- Derived and proved the correctness of the Brzozowski derivatives for extended regular expression operations
- Implemented the Brzozowski algorithm in a functional language (Scala)

Userland shell: A minimal userland shell written in Rust   09/2021 – Ongoing

- Implemented common internal commands, redirection and pipes
- Added support for background processes using threads

Optiver volatility prediction: Predict volatility given past trade and price series   08/2021 – 09/2021

- Implemented and compared different algorithms (decision trees and NN) in Python
- Optimized hyperparameters using Optuna
- Designed the prediction generator architecture having extensibility in mind

Userland rootkit: A Linux rootkit in C based on hijacking DLL   08/2021 – Ongoing

- Added support for hooking system calls using LD_PRELOAD environment variable

MapReduce client/server: A MapReduce implementation in Golang   07/2021

- Implemented the MapReduce model based on the paper *MapReduce: Simplified Data Processing on Large Clusters* by Google and the MIT Distributed Systems course

Sokoban solver: A Sokoban solver using PDDL and OPTIC planner   04/2021

- Analysed and performed experiments with OPTIC planner applied to Sokoban game
- Wrote a detailed report in LaTeX

Blog: Hacking and competitions writeups   Ongoing

- Worked on and analysed 20+ challenges and vulnerable machines on HackTheBox and other CTFs
- Wrote walkthroughs notes about operating system internals, shells, exploits

Algorithms implementation: Python implementation of algorithms   Ongoing

- Implemented greedy and DPLL SAT solver
- Implemented algorithm to perform topological sorting given a directed graph
- Implemented algorithm to generate a connected components graph from a directed graph
- Implemented 2-opt TSP solver, to find local minimum weighted Hamiltonian cycle in a complete graph expressed with a cost adjacency matrix
- Implemented KMeans for clustering and Hunt algorithm for building a decision tree

Experience

GIAC Hacker tools, techniques, exploits and incident handling training, SANS Institute   Remote

- Studied in detail defensive and offensive operations in internal networks

CTF Content Creator, SANS Institute   Remote

- Designed a challenge about extracting confidential data from leaked .git directory

HackTheBox Pro Hacker   Remote

- Solved (mostly) reverse engineering challenges using Ghidra, x64dbg and gdb
- Attacked 15+ (mostly) Linux machines

SnapSense (Startup)   Remote

Software Developer   03/2021

- Implemented a diabetes ulcer monitoring system using Ruby on Rails
- Deployed resources and backend server to AWS using S3, RDS and EB cloud services

King's College London Chinese Students and Scholars Association   Remote

Software Developer   09/2020

- Built a WeChat miniprogram for news, weather, restaurant listing, second hand exchange, events and more
- Added support for one-click event booking

SELECTED AWARDS

- GIAC Advisory Board member (top performance)   2020
- Undergraduate Informatics Year 1 or Year 2 Prize (best performance)   2020
- Silver Prize, Iberoamerican Olympiad in Chemistry   2019
- Silver Prize, National Olympiad in Chemistry   2019
- Silver Prize, National Olympiad in Physics   2019

SKILLS

Programming Languages: Python, Golang, C++, C, Rust, Ruby, Scala, JavaScript, Java (ranked by proficiency)
Tools and Frameworks: Pytorch, Tensorflow, Docker, Ruby on Rails, Vue, React, React Native, Git, LaTeX