

doy-lee // TODO: Doyle T.

G'day, I'm a software developer that enjoys low-level programming.

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Work

2022 - Present C++ Senior Software Engineer, Agent Orientated Software ^{AOS} (AI)

2020 - 2022 C++ Software Engineer, Agent Orientated Software ^{AOS} (AI)

C++17, CMake, Docker, DDS+Kafka (distribution), discrete event simulators (game engine-esque)

AOS creates creating trustable and explainable AI using *multi-agent systems* with the cognitive framework, *Beliefs, Desires and Intentions* (BDI). My role involves improving the AI toolchain such as improving cross-agent collaboration, forward planning, scheduling and de-conflicting of agent intentionality, its execution and distributed agent communication to improve resilience in adversarial situations.

- Coordinating multiple toolchain upgrades of our in-house AI frameworks, end-to-end
- Added virtual-memory backed allocators for cache locality, reduced sys-calls and memory profiling
- Co-implement protocol to distribute agents onto different routing technologies (DDS & Kafka)
- Responsible for the docs website with APIs & manuals, end-to-end for production releases
- Implement multiple discrete event simulators for verification of agent behaviours
- Documenting best practices, patterns and tutorials for designing effective multi-agent systems
- Implement real-world system specs in a multi-agent architecture to highlight deficiencies in the development methodology leading to new protocols, e.g. researching interfaces for humans to effectively contribute into the agent decision making.

Agent Orientated Software aosgrp.com

2018 - 2020 C++ Software Engineer, Oxen (Blockchain)

C++14, Boost, CMake, Docker, Android+Windows+Mac+Linux clients, Qt5, Monero Cryptonote & EPEE Levin P2P Protocol, Open Source Maintainer (Oxen), Libsodium (EC Cryptography)

Oxen is a non-for-profit, open-source company developing privacy protocols and tools. I implemented[1] a decentralized layer of servers known as the Service Node[2] network that distributes the blockchain and maintains layer access-control. They coordinate peer-to-peer to evict underperforming and malicious peers whilst generating entropy for securing blocks using checkpointing[3] and a commit-reveal scheme known as Pulse[4].

With over 1k+ servers and growing, the Service Node network provides a sybil-resistant foundation to facilitate a privacy preserving onion routing network, Lokinet, and, a privacy preserving messenger, Session.

- Rapidly learning & up-skilling as their first developer in the startup to form a development methodology and hiring practices
- Implement a resilient server layer over new P2P gossip protocols: node de/registration & rewards, service metrics & voting
- Form immutable checkpoints to secure blocks using shared consensus to provide faster finalization of transfers on the network
- Create an on-chain DNS registry to map cryptographic keys to human readable aliases (e.g. Lokinet domains, Oxen wallets and Session aliases)
- Transition from Proof of Work to Proof of Stake live in production, deprecates miners for a commit-reveal scheme to generate entropy for minting blocks
- Ownership of release process (build/package/distribute) end to end.
- Patching of 0-days and exploits & recovering from consensus failure on a live production network
- Improved the test framework for including re-write of Monero's framework and adding integration tests using IPC over named pipes

Oxen Website oxen.io

- [1] Git Commits github.com/oxen-io/oxen-core/pulls?q=is%3Apr+author%3Adoy-lee+is%3Aclosed
- [2] Service Nodes oxen.gitbook.io/oxen-docs/about-the-oxen-blockchain/oxen-service-nodes
- [3] Checkpointing github.com/oxen-io/oxen-improvement-proposals/blob/master/LIPS/LIP-3.md
- [4] Pulse github.com/oxen-io/oxen-improvement-proposals/blob/master/LIPS/LIP-5.md

2017 - 2017 C++ Intern Software Engineer, Wargaming Sydney 🎮 (Game Dev)

Game development company most popular for developing World of Tanks. I was in the tools team assisting with the development of the editor for the asset pipeline.

Wargaming Sydney wargaming.com

2014 - 2017 B. Computer Science, University of New South Wales 🇦🇺

UNSW unsw.edu.au

Projects Summary

2018 - Present Dqn: C/C++ personal standard library github.com/doy-lee/dqn

2020 intc: Software u128/256 bit port to C github.com/doy-lee/intc

2020 RaylibSIMD: SIMD Software rendering in C github.com/doy-lee/RaylibSIMD

2017 DTRenderer: 3D Software rendering in C++ github.com/doy-lee/DTRenderer

2017 Math Masher: math game for mobile doy-lee.github.io/luneaustralia

2017 DCHIP8: Chip8 interpreter github.com/doy-lee/dchip-8

2016 Dengine: 2D engine for asteroids github.com/doy-lee/dengine