

doy-lee // TODO: Doyle T.

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

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Work

2022 - CURR: 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, Loinet, 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. Loinet 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: 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 - CURR: Dqn C/C++ personal standard library github.com/doy-lee/dqn

2021: 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 doylet.dev/luneaustralia

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

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