John Kelly

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EDUCATION

Imperial College London	London, England
Bachelor of Engineering in Electrical & Information Engineering	*Sep. 2023 - July 2026*
Magdalen College School	Oxford, England
A-levels in Maths (A*), Computer Science (A*), and Physics (A*)	*Sep. 2015 - July 2022*

ACHIEVEMENTS

Microsoft Most Valuable Professional Award Nomination	2022
World's youngest nominee at time of nomination (age 18)	
.NET Foundation Voting Member	2020
World's youngest member at time of acceptance (age 16)	
GCHQ CyberDiscovery Program	2019
Attended to the in-person CyberDiscovery Elite camp as part of the only team that successfully cracked the final challenge	
Oxford University Computing Challenge	2018
Top 15 result out of over 10,000 international participants	

EXPERIENCE

Software Engineer - Intern	June 2021 – Aug. 2021
Hero Health Software	*Oxford, England*

- Migrated a background-job service between frameworks
- Designed, implemented, and tested code & infrastructure for card-reader payment systems

Software Engineer - Placement Year	Sep. 2022 – Sep. 2023
Hero Health Software	*Oxford, England*

- Led a multi-team project over 6 months, integrating a new clinical system into the application, spanning multiple languages, frameworks, and services
- Re-designed the CI/CD pipeline, cutting test times from 90 minutes to 15 minutes and reducing cost
- Built an extensible analytics API & dashboards to improve internal product monitoring
- Optimised high-throughput data processing services, cutting median execution time from 2 hours to under 4 seconds

Open Source Work
Microsoft, Rust Foundation, & others

- Optimised array & slice codegen, introduced new correctness lints, and improved the macOS build process for the Rust compiler
- Updated, improved, and introduced the official DirectX 12 documentation across 50+ pages
- Implemented the TRY302 correctness item for the Ruff python linter
- Fixed bugs across a range of projects, including the Stripe CLI, Ruby on Rails, Rubocop, and the C# compiler

PROJECTS - *See 'Pinned' section of GitHub profile*

MathSharp	*C#, x64, SIMD*	Oct. 2019

- The fastest SIMD-focused linear algebra library for C# at time of release
- At time of release, offered 40-75% speed improvements over the .NET Core library & other alternatives
- Utilised x64 & AArch64 architecture extensions including FMA, SSE, AVX, and NEON
- Developed micro-benchmarking and correctness suites for a large array of floating-point math benchmarks
- Gained over 600 stars on Github & over 7,000 downloads

Voltium	*C#, DirectX, Metal, 3D Graphics*	Ongoing

- Lightweight, cross-platform render engine focusing on performance and usability
- Developed a system to allow remote rendering & debugging using a proprietary command buffer system
- Integrated with modern raytracing APIs and GPU debuggers
- Created a render graph & ECS framework to allow efficient scheduling & execution of rendering

Sudoku Solver	*Python, C, Graph Theory*	June 2022

- Wrote Python & C implementations of traditional Sudoku solver algorithms to demonstrate static vs dynamic language performance differences
- Developed a novel backtracking optimisation that yielded ~99.3% speed improvement with ~99.4% fewer iterations
- Created a simple CLI to demonstrate performance by algorithm & language