Samuel **Marks**, PhD

Modus Operandi

Split my life in three: family; medical charity; and business. The unrelated-to-medicine business funds the first two. Focus is on open-source scalable engineering. Recently awarded an in-kind **grant worth $3.2M** for neural compute processor access from Google.

Links

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Career cliff notes

◇ As a contractor working on unrelated sensor network metric aggregation, showed the largest communications company in Australia how to **save $100M;**
◇ Given the entire top floor of the JP Morgan building to go from nothing to a full product in the Natural Language Processing (NLP) industry (all my subcontractors, including postdoctoral computational linguists)… with the backing of a billionaire family. Company **acquired by calendly**;
◇ Built a stock market analytics platform (for a high-net-worth individual);
◇ Created deduplication algorithms and databases for helping one large bank—who bought another large bank—to join customer profiles (for a Venture Capital fund, who then proceeded to **raise $60M** off this);
◇ Engineered a distributed system for a blockchain company (my 'stock' in their company has since **gone up > 16000%**).

Approach

My goal in engineering open-source compilers, DevOps, and developer tooling is to: accelerate development, trivialise portability across platforms (OS; distribution; cloud), and facilitate new engineer on-boarding.

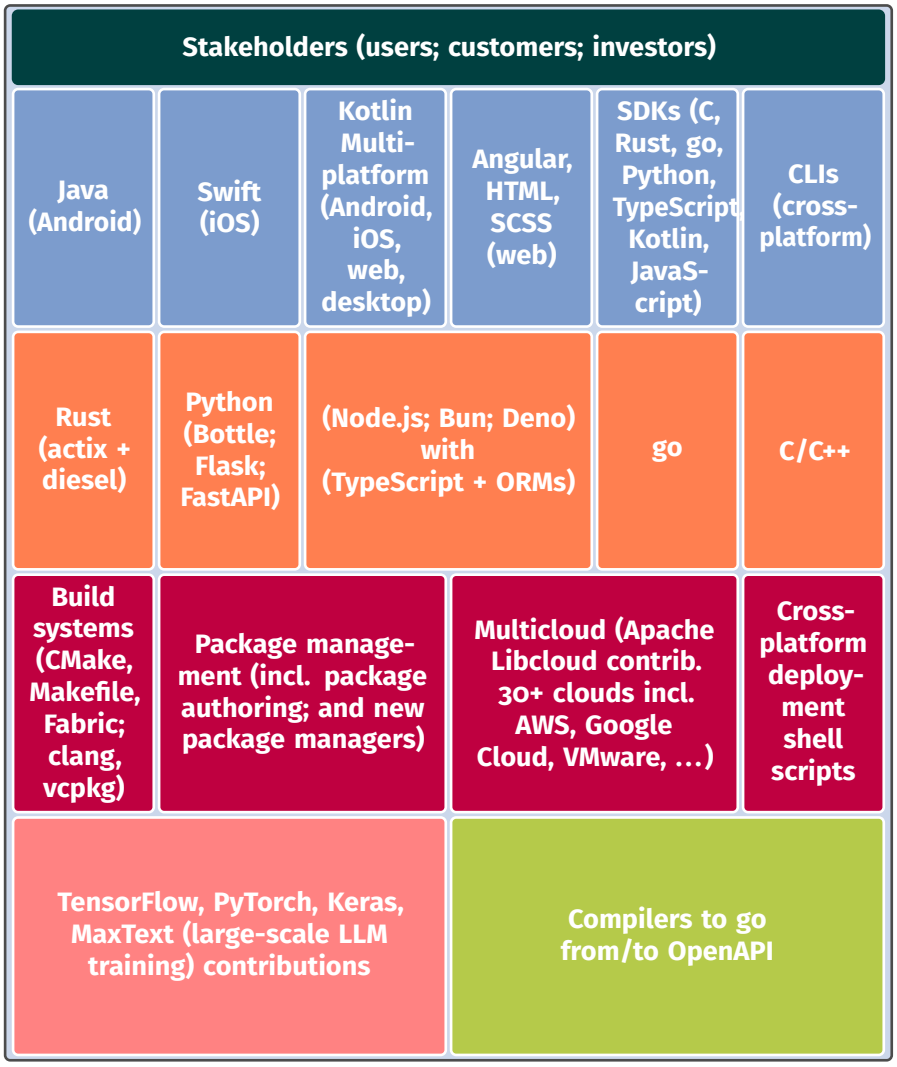
My current focus is creating new compilers to [bidirectionally] translate OpenAPI ↔ numerous targets (including Rust, Swift, Kotlin Multiplatform, C, TypeScript, and Python) in order to speed up the development of multi-tier, multi-language applications (e.g., mobile apps; web frontends; REST API backends; SQL databases).

My recent work involved creating from-scratch new DevOps / GitOps / MLOps tooling with optional Docker, supporting: native Windows, Linux, macOS, SunOS, HP/UX, z/OS, iOS, and Android. This was written in shell (Bourne Shell, Bash, Windows Batch, Microsoft PowerShell); complemented by new package managers in C, Go, and Rust.

Research driven, I hold a PhD and a fellowship at Harvard. A top contributor to Keras, the 2nd most popular Machine Learning framework; and [before contracting] was the only non-Google maintainer of JAX-based LLM training & inference library MaxText; deployed to 50k chips (TPUs). To both PyTorch and TensorFlow: contributed C++ code optimising their vector allocations. I am a Google Developer Expert for Machine Learning (ML/AI GDE).

Technical expertise

I take pride in working at every level of the stack:



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Differentiator

I build technologies to speed-up development, and futureproof software-engineering.

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Open source projects

800+ GitHub repositories, incl.:
◇ Compiler implementations in Rust, Python, C, Swift, Java, and Kotlin
◇ OAuth2 server implementations in Rust, Python, and Node.js
◇ New package managers in: go; Bourne Shell (`/bin/sh`); C; and Rust
◇ Getting-started scaffolds in Angular, Python, Rust, Swift, Kotlin, Java
◇ {CLI, SQL, GUI, SDK} [bidirectional] generation from/to Python SDKs, e.g., major machine-learning frameworks like Keras
◇ Multicloud provisioning and deprovisioning toolchains, including new JSON wrappers in Python, a new Google Cloud C SDK, and a new WASM implementation
◇ 1-click deployment + documentation system generation from my new shell script library; including porting Apache Libcloud to WASM (WebAssembly)

Experience

Senior Software Engineer (contract) at *Google* **2025+**
◇ Working on MaxText; a high performance, highly scalable, open-source LLM written in pure Python/Jax and targeting Google Cloud TPUs and GPUs for training and inference. MaxText achieves high MFUs and scales from single host to very large clusters while staying simple and "optimization-free" thanks to the power of Jax and the XLA compiler.

We have used MaxText to demonstrate high-performance, well-converging training in int8 and scale training to 51K chips.

Mass. Eye and Ear Infirmary / Harvard Medical School. **2021+**
◇ Collaborating with ophthalmologists on initiating new medical diagnostic screening programmes that are wholly charitable, open-source, patent-free, and AI-driven; and analysing & modelling from historical data in preparation.

Head of software engineering at *consultancy offscale.io* **2015+**
◇ Consulting for various high-net-worth individuals, the odd venture capital firm, and any random project introduced word-of-mouth to me. Ranges from just me, to as many as 20 engineers.

◇ Engineers open-source developer tools to speedup engineering of scalable software. Foci on: cross-platform, multi-ML, multicloud, and compilers to translate across codebases. github.com/offscale

◇ *NOTE: Firm purposefully avoids anything related to medicine to avoid actual—or perceived—conflicts of interest with charitable research.*

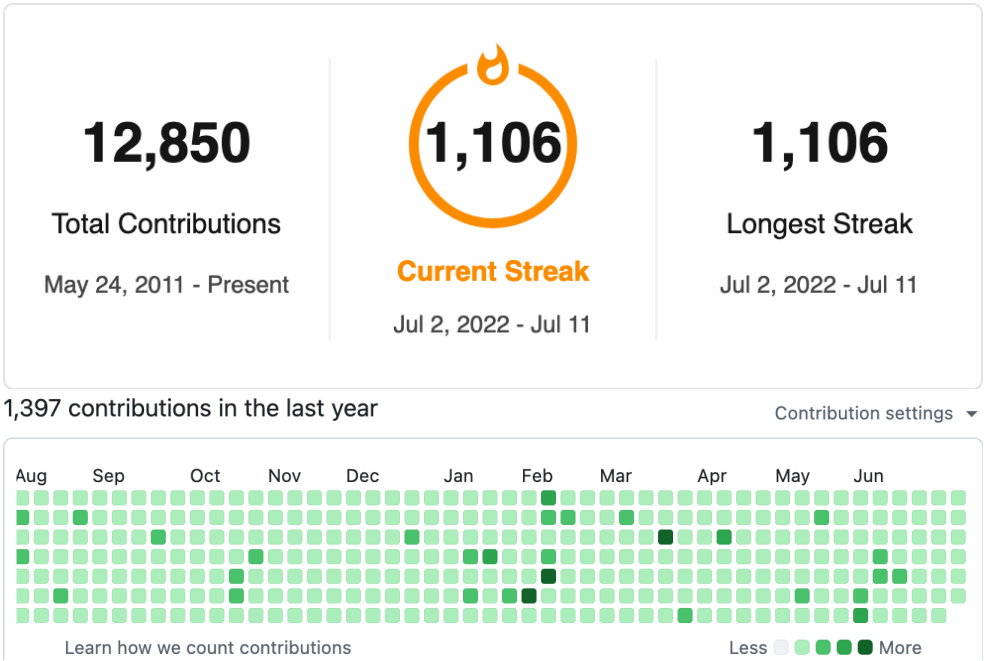
Education

Fellowship. *Harvard Medical School.* **2021+**

Doctor of Philosophy (PhD). *University of Sydney.* **2015–2020**

Bachelor of Science. School of Computing. *Macquarie U.* **2010–2014**
◇ Covered a range of subjects supporting my passion for computer science.

Open-source



800+ repositories on GitHub, >300 of these original projects (not forks). Top-10 contributor to Google's Keras (2nd-most popular ML framework; with 13 million downloads per month; as of Feb 2025). Only non-Google maintainer [now contracting for Google!] of Google's large-scale LLM training reference—that they test on >50,000 TPUs—https://github.com/AI-Hypercomputer/maxtext.