

Sasha Lopoukhine

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EDUCATION

University of Cambridge

PhD in Computer Science supervised by [Tobias Grosser](#)

Cambridge, UK
Jan 2023 — Present

Researching the use of MLIR and multi-level compilation to effectively target AI accelerators.

[A Multi-level Compiler Backend for Accelerated Micro-kernels Targeting RISC-V ISA Extensions](#) Led the development of a novel MLIR-based linear algebra micro-kernel backend that targets ETH's Snitch Core, yielding 95% FPU utilization and 94% of theoretical maximum throughput for our chosen kernels. Neural networks compiled via this micro-kernel outperform the state of the art by >20x.

[Sidekick compilation with xDSL](#) Lead the development of [xDSL](#), a more approachable and hackable compiler framework.

University of Cambridge

BA in Computer Science - II.i

Cambridge, UK
2012 — 2015

Received Bob Diamond prize for Computer Science.

EMPLOYMENT HISTORY

Venture Fellow

Creator Fund

Oct 2024 — Present
Cambridge, UK

Empowering researchers to start their first company. Sourcing Cambridge-based startups and doing due diligence for startups in CS.

Co-Founder & Chief Engineering Officer

Cub3

September 2021 — January 2022
Los Angeles, CA

Led development of a platform that enabled third parties to employ Web3 tools, NFTs, and other blockchain technology to encourage positive behavior in online fan communities. Spearheaded the engineering team, developing a minimal viable product, identifying key features and coordinating efforts.

Software Engineer

Apple

March 2018 — September 2021
Cupertino, CA

[Curated Library](#) – a novel iOS 13 feature providing user photos in a curated perspective free of memes, screenshots, and duplicate images, deployed to **over a billion devices**.

- Responsible for efficient calculation of the unique [Years/Months/Days](#) display on the Curated Library page, leveraging date, time, and other metadata to provide a beautiful, clutter-free, display of the user's photo library.
- Carried out extensive performance and unit testing, building new profiling infrastructure in the process.

Patent: US20200356227A1 – **Curated Media Library**

[On-disk graph](#) – a novel infrastructure component of Photos Memories. Enabled numerous features, such as on-demand availability of all Memories, automatic song selection, and next memory suggestion.

- Implemented a graph database to represent Memories data, accommodating roughly 1,000 times more data than the previous representation.
- Led the migration of existing features to the new database, with minimal regressions, leading to a 9x reduction in testing time—from 1 hour and 30 minutes to 10 minutes.
- Added many new unit tests to ensure the continued high quality of this component of the infrastructure.

[Next memory suggestion](#) – a recommendation engine for the Memories interface that suggests new memories to watch

- Developed a novel recommendation engine for Memories, leveraging features of the current Memory, and the user's library.

[Integration of Apple Music into Memories](#) – a [feature](#) that lets users select any song from the Apple Music library to play in Memories.

- Required handling enormous data sets including over a billion users' photo libraries and Apple Music's 90 million song library.
- Led the feature extraction efforts to provide the recommendation engine with information from the Memories database to suggest appropriate music.
- Provided Swift mentoring to the team and offered guidance on the project's software architecture and design patterns.

[Keyboard extension](#) – a cutting-edge tool leveraging the Snips Personal Knowledge Graph to suggest phrases from their personal database as they entered text throughout iOS.

- Created a software keyboard that interacted with supporting services (email, calendar, and contact

information) to extract the necessary information as the user was typing.

- Enhanced the functionality of the auto-completion and next-word recommendation.
- Developed a bespoke binary-encoded language model that loaded in milliseconds and outperformed the built-in keyboard in terms of word recommendations, auto-complete, and auto-correction.

Snips Platform – Labs - prototyped natural language parsers and applications built on top of them.

- Built an interactive voice assistant on iOS, that could handle queries such as “Show me photos from the restaurants I went to last week” using CKY parsing.
- Built an interactive voice assistant engine that would fill in the gaps in user’s queries.
- Developed prototypes for voice-activated gadgets such as speakers and coffee machines.

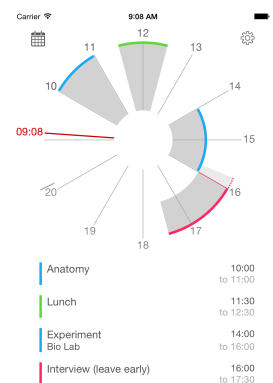
Cofounder & CEO

Blue Tatami

Blue Tatami was a startup developing personal productivity applications on iOS. We developed Dodeka, an iOS program for displaying calendar events on a 12-hour watch face. This program required a unique visualization designed from the ground up to show the current day’s calendar events in the clearest way possible.

- Developed the project’s concept and wrote app from scratch
- Introduced a unique personal productivity tool
- Created innovative graphics and design features
- Grew to **more than 6,000 users** with no advertising

2014 — 2016
Cambridge, UK



PROJECTS

Maintainer, [xDSL](#)

Jan 2023 — Present

xDSL is a pure Python re-implementation of MLIR that makes modern compiler development more productive, accessible, and fun.

Author, [Simple Datagram Protocol](#) | [Article](#)

2017

Worked around Apple’s requirement for devices to have Made for iPhone certification to access Bluetooth, by using BTLE to transfer configuration data to Raspberry Pis instead.

Author, [BioSwift](#)

2015

First open-source framework in Swift to handle gene data.

PRESENTATIONS

[2023 EuroLLVM - Prototyping MLIR in Python](#)

[2023 LLVM Dev Mtg - Compiler backend design with MLIR](#)

[2024 EuroLLVM - Teaching MLIR concepts to undergraduate students](#)

[2024 LLVM Dev Mtg - Quidditch: An End-to-End Deep Learning Compiler for Occamy using IREE & xDSL](#)

SKILLS AND AWARDS

- Programming Languages:** Python, Swift, Objective-C, C/C++, JavaScript/TypeScript, Assembly
- Languages:** Fluent in English, Russian, French