

## Professional Experience

- 2025 – Now **Software Engineer (Part-Time & Summer Internship)**, *Columnar*.
- Built the Arrow Database Connectivity (ADBC) extension, connecting DuckDB to 40+ database systems.
- 2024 **High-Performance Query Processing Engineer (Summer Internship)**, *Amazon Web Services*.
- Integrated UDF batching into Redshift, speeding up Lambda UDFs in CASE WHEN statements by 1000×.
- 2021 **Compiler Engineer (Full-Time)**, *Apple*.
- Reduced JIT-compile times for Metal's AMD compiler, shipping Metal-accelerated rendering in Blender 3.1.

## Open Source Contributions

- 2023 – Now **DuckDB**, <https://github.com/duckdb/duckdb>.
- Modified DuckDB's binder and subquery decorrelation pass to handle LATERAL joins, shipping in v0.9.
  - Built the DuckDB ADBC extension, enabling DuckDB to connect to 40+ database systems.
- 2024 **PRISM**, <https://github.com/SamArch27/PRISM>.
- Built an optimizing compiler for PL/SQL UDFs as a 7000 line C++ extension to DuckDB. PRISM includes a custom front-end, intermediate representation, UDF-centric compiler optimizations, and a C++ code generator.

## Education

- 2022 – Now **Carnegie Mellon University**,  
*Doctor of Philosophy (Ph.D.), Computer Science*.
- Advisors: Andy Pavlo, Jignesh Patel, Todd Mowry
  - Thesis: "Leveraging Compilation Techniques for Efficient User-Defined Function Execution"
- 2017 – 2020 **The University of Sydney**,  
*Bachelor of Engineering (Software Engineering)*, Honours Class I and The University Medal.

## Selected Talks

- 2024 **Dear UDFs, I Broke Up With You But Now I'm Ready To Give You a Second Chance. Will You Take Me Back? Sincerely SQL.**, <https://www.youtube.com/watch%3Fv%3DXXMIEknQQKIM>.
- NYC Systems, Databricks, UC Berkeley, UW Madison, Microsoft's Gray System's Lab, University of Washington

## Selected Publications

- CIDR 2027 **Rows? Where We're Going, We Don't Need Rows. Redefining Data Connectivity for the AI Era with ADBC.**  
[Samuel Arch](#), David Li, Matthew Topol, Ian Cook, Bryce Mecum, Mandy Alimaa, Dewey Dunnington, Felipe Oliveira Carvalho, Curt Hagenlocher, Pedro Holanda, Kent Wu, Emil Sadek, Tatsuya Shima, Wes McKinney.
- VLDB 2025 **The Key to Effective UDF Optimization. Before Inlining, First Perform Outlining.**  
[Samuel Arch](#), Yuchen Liu, Todd C. Mowry, Jignesh M. Patel, Andrew Pavlo.
- CIDR 2024 **Dear User-Defined Functions, Inlining Isn't Working Out So Great for Us. Let's Try Batching To Make Our Relationship Work. Sincerely, SQL.**  
Kai Franz, [Samuel Arch](#), Denis Hirn, Torsten Grust, Todd C. Mowry, Andrew Pavlo.

## Awards

- 2026 **SIGMOD 2026 Research Highlight Award.**
- Awarded to the ten best research papers from the last year that exemplify core database research.
- 2025 **VLDB 2025 Runner-Up Best Paper Award.**
- Awarded to the 2<sup>nd</sup> best research paper at VLDB 2025, selected from 369 papers in database systems.
- 2021 **The University Medal (The University of Sydney).**
- Awarded for quality of work in the undergraduate research thesis similar to that of first-rate academic journals.

## Skills

- Expertise Systems Programming, Compiler Optimization, OLAP Internals
- Languages C++, C, SQL, PL/SQL, Python