

# Arno Cai

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## TECHNICAL EXPERIENCE

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### **Willow**, *Software Engineer & Creator*

2024 – present

Willow is an open-source framework for building Change Data Capture pipelines, updating caches in near real-time. Read more at <https://willow-cdc.github.io/> 

- Developed a Change Data Capture framework to detect PostgreSQL database changes and update Redis caches, leveraging open-source tools such as Debezium and Apache Kafka to create the event-stream.
- Designed a storage strategy enabling data persistence of created pipelines (PostgreSQL, Docker Volumes)
- Prototyped and developed the Willow back-end server, which exposes RESTful APIs for creating, managing, and deleting pipelines stored in PostgreSQL.
- Built a user-friendly UI that streamlines the pipeline creation process, using React and Material UI.
- Dockerized the Node.js back-end server, React UI, and other app components to streamline installation.
- Authored technical case study. 
- Collaborated with a remote team of four engineers across different countries and time zones.

### **Software Engineer**, *Self-Employed*

2022 – 2024

A selection of the open-source projects developed during my career transition:

- *Lasso* – A webhook monitoring tool (DO Droplet, Nginx, MongoDB, PostgreSQL, Node.js, PM2, Express, React).
- *Activity Tracker* – Website for users to track and log their activities (Express, Postgres, JavaScript, Pug).
- *Zapn-AD* – Software library which employs automatic differentiation to compute derivatives of arbitrarily complex functions (Python).

### **Harvard University**, *Research Project and Data Assistant*

2020 – 2023

- Used novel method to identify Psychiatric Mental Health Nurse Practitioners (PMHNPs) within Medicare Part D data, showing that PMHNPs are offsetting the shortage of psychiatrists. Published in *Health Affairs* and featured in various media outlets.
- Retrieved and analyzed healthcare data from the Stanford PHS Server, advancing project on relationship between oncology specialization and patient outcomes. Presented preliminary results in the 2022 AcademyHealth Conference. Poster won Best Poster under the “Health Workforce” theme.

### **Williams College**, *Allison Davis Research Fellow*

2017 – 2019

- Researched relationship between immigration raids and health outcomes of infants in utero at time of raid supported by birth data from the National Center for Health Statistics.
- Examined how antihistamine purchases have changed alongside an extending pollen season by analyzing a +100M observations dataset.

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## LANGUAGES AND TECHNICAL SKILLS

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**Back-end** — Golang, Python, PostgreSQL, MongoDB, RESTful APIs, Node.js, Express

**Front-end** — JavaScript/TypeScript, React, HTML/CSS, jQuery, Handlebars

**Other tools** — Git/GitHub, Docker, Linux, Bash, DigitalOcean Droplets, AWS ECS, AWS EC2, Nginx, Postman, Apache Kafka, Debezium, Jest, Stata

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## EDUCATION

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### **Launch School**

2023 – 2024

A multi-year mastery-based software engineering school emphasizing fundamentals.

### **Williams College**

2015 – 2019

*B.A. in Economics & Asian Studies, Magna Cum Laude*

Relevant Coursework: Data Structures & Algorithms, Agile Software Development, Systems Development for Computational Science, Linear Algebra, Probability Theory, Statistical Inference, Abstract Algebra, Real Analysis.