

# Kabir Samsi

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Undergraduate researcher and software engineer passionate about everything from programming languages, compilers & systems to software engineering, algorithms & machine learning. Highly skilled in multiple languages and frameworks; strong experience in PL & ML research, software engineering, team leadership, data engineering & teaching.

## EDUCATION

### Cornell University

Ithaca, NY

*Bachelor of Arts – Computer Science, Mathematics & Music*

*Aug. 2022 – May 2026*

- **Relevant Coursework:** Algorithms, Honors Data Structures, Programming Languages, Program Synthesis, Systems Programming, Functional Programming, Machine Learning, Probability Theory, Linear Algebra
- **Dean's List Recipient** (All Semesters), Pursuing CS Honors

## RESEARCH & TEACHING EXPERIENCE

### PL & Compiler Design Researcher

June 2024 – Present

*CAPRA @ Cornell University*

*Ithaca, NY*

- Student researcher advised by Professor Adrian Sampson at Cornell's Capra Research Group.
- Researching the optimization of programmable packet scheduling on smartNICs and integration with FPGAs.
- Developing the Pollen framework & compiler, a language for accelerating queries on pangenomic DNA graphs.

### Head Teaching Assistant

August 2023 – Present

*CS3110 (Data Structures & Functional Programming) @ Cornell University*

*Ithaca, NY*

- Taught concepts including data structures, functional programming, PL/interpreter design & formal verification.
- Hosted exam review sessions, led weekly TA meetings and grading; designed coursework and lab material.
- Ran recitations of 15-20 students, weekly office hours, & moderation/answering questions on discussion forums.

## WORK EXPERIENCE

### Software Development Engineer

August 2023 – Present

*CMSX @ Cornell University*

*Ithaca, NY*

- SDE advised by Professor Andrew Myers at Cornell's Course Management System X (8K+ users & 100+ courses).
- Significantly improved the staff interface; redesigned the grading system and developed new CSV integrations.
- Documented and refactored large portions of the Java codebase and migrated much of the stack to React.js.

### Machine Learning & Data Analyst

October 2022 – May 2024

*Cornell Lab of Ornithology*

*Ithaca, NY*

- Classified 5000+ images and developed audiovisual bird ID models & data cleaning scripts for the Merlin Project.
- Curated database profiles for 300+ species splits for the eBird packs in Indonesia & Taiwan.

## PROJECTS

### KLATS | OCaml, Python

November 2023 – Present

- Functional language and typesetter for linear algebra operations. Introduces OCaml-esque notation and new features including vector and matrix comprehensions, matrix factorizations, typed coordinate systems and more.

### Franz | Rust, C++

November 2023 – Present

- Programming language and compiler to represent music. Features include rhythm comprehensions, scale sequences & motivic pattern matching; compiles to ChucK, an audio-production language.

### Saberchat (Team Lead) | MEAN Stack

June 2020 – May 2022

- Platform for schools & organizations aimed to facilitate community engagement. Includes multiple content-sharing systems, an online classroom/tutoring center & a streamlined preorder and inventory interface for retail groups.

### FindYourBird | MEAN Stack, Neo4j

June 2020 – May 2024

- Bird identification, search & observation data logging platform serving as a tool for amateur ornithologists. Includes an identification system, information pages on 100+ different species & user-specific target species and locations.

## TECHNICAL SKILLS

**Languages:** JavaScript, Java, Python, C, C++, Rust, OCaml, Haskell, C#, Go, Ruby, Swift, Assembly, HTML, CSS

**Frameworks:** MEAN Stack, React, Ajax, JQuery, JSP/EJS, Flask, Pandas, Numpy, TensorFlow/Keras, PyTorch

**Databases & Systems:** MongoDB, SQL/PostgreSQL/MariaDB, Neo4j, Git, Docker, AWS

**Expertise:** Programming Languages, Compilers, Software Engineering, Research, Machine Learning, Algorithms