

JAM KABEER ALI KHAN

[GitHub](#) · [LeetCode](#) · [Personal Website](#)

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EDUCATION

University of Hong Kong

BEng Computer Science and Mathematics
Major GPA: 3.56

Hong Kong SAR

Sep 2021 - June 2025

Northeastern University

BSc Computer Science and Mathematics (Semester Exchange)
GPA: 3.92

Boston, USA

Jan 2024 - May 2024

RESEARCH EXPERIENCE

Programming Languages Group

Bachelor's Thesis supervised by Bruno C. d. S. Oliveira (Haskell | Coq | OCaml | Gallina)

Hong Kong SAR

Aug 2024 - Present

- Design and implementation of EnvCap programming language, incorporating capabilities as first-class modules in Haskell. Utilizing unit and property-based testing methodologies to ensure the correctness of the implementation.
- Conduct an in-depth study on separate compilation and first-class environment-based semantics, employing formal methods in Coq to prove theorems and properties.

Quantum Information and Computation Lab (QICI)

CS Research Intern supervised by Ravishankar Ramanathan (Python | Matlab | Julia | CVXPY)

Hong Kong SAR

June - Aug 2024

- Performed numerical calculations using convex optimization techniques, e.g., Linear Programming, SDP Programming, and Duality, for certifying randomness generation using MATLAB and Julia.
- Designed a Quantum Key Distribution Protocol by devising Bell's inequality maximally violated by simplex projections and proved its self-testing properties using Sum-of-Squares (SOS) decomposition.

HKU Sleep Lab

Research Assistant supervised by Shirley X. LI (Java | Objective-C | Android Studio | XCode | XML)

Hong Kong SAR

March - Oct 2022

- Migrated legacy code base from support to AndroidX libraries. Integrated ExoPlayer, optimized performance with caching, reduced server load by 80%, and integrated Mandarin language support and customized video player.
- Debugged iOS app and removed server connectivity, audio, and video player bugs. Implemented multi-threading in mobile applications to improve user experience and performance. Developed a migration plan to Swift.

INDUSTRY EXPERIENCE

ActusRayPartners Limited

Software Engineer Intern (Python | MSSql | PyUnit | VBA | Docker | Flask)

Hong Kong SAR

June - Aug 2023

- Developed an internal Python database management library using SQLAlchemy, Pandas, and MSSQL, improving efficiency by 40% and reducing data corruption risks. Integrated VBA and Flask to enable real-time saving and loading functionalities in trade technology, ensuring synchronization among traders.
- Created multi-threaded applications to enhance processing times and optimize resource utilization, while applying solid software engineering principles such as design patterns and object-oriented programming.

All Round Education Academy

Full Stack Developer (JavaScript | ReactJS | NextJS | Redux | TailwindCSS | CSS | HTML)

Hong Kong SAR

March - Nov 2023

- Developed a full-stack Ed-tech revision web app and deployed it to 30+ users, implementing caching mechanisms using Redux-store for dynamic user data storage and retrieval, and followed test-driven development practices to ensure the reliability and maintainability of code.
- Designed and implemented a secure authentication system using Auth0, leveraging Redux for state management, and conducted A/B testing to inform design decisions and enhance user experience.

TEACHING EXPERIENCE

Department of Computer Science, HKU

- Student Teaching Assistant (COMP2396: Java)
- Student Teaching Assistant (COMP2113/ENGG1340: C/C++)
- Student Teaching Assistant (COMP2113/ENGG1340: C/C++)

Sept 2024 - Present

Sept 2023 - Dec 2023

Jan 2023 - May 2023

SKILLS

Programming Languages: **Python, Java, C/C++, JavaScript, Haskell, Racket, Dart, VBA, Coq**

Frameworks: **NextJS, ReactJS, ExpressJs, Flutter, Android Studio, TailwindCSS**

Course Work: **Algorithms, Data Structures, Database, Networks, Functional Programming, etc.**

PROJECTS

SLUG Programming Language - Interpreter Racket

Graduate Project @ Northeastern. Toy language with bindings, functions, and conditionals using the functional paradigm.

BGP Router Simulator Python

Handling data packet routing, forwarding tables, IP addresses, and aggregation.

[GitHub](#)

FlyMate Mobile App Flutter, Dart

Travel app for people with disabilities won Cathay Hackathon '23 (Got a free ticket to Boston).

[GitHub](#)

Distributed Database Python

Implemented key-value store database using RAFT protocol from [paper](#).

[GitHub](#)

Linux Shell C

Linux shell with process creation, command execution, and support for piping commands using POSIX API.

[GitHub](#)

AI-Agent for Notakto C++

Implemented the algorithm from the following research [paper](#) to create an unbeatable AI-Agent for Notakto.

[GitHub](#)

Card Game Java, Swing, OOP

Multiplayer Card Game with GUI for Big Two game.

[GitHub](#)

NFT Platform Mobile App Flutter, Dart

Prototype of an NFT marketplace with social media.

[Github](#)

AWARDS AND HONORS

- **HKU Undergraduate Entrance Scholarship for Outstanding Academic Talents** 22', 23', 24'
- **HKSAR Government Scholarship Fund** 21', 22', 23', 24'
- **UBS Hackathon: 3rd runner-up** 2024
- **Rosita King Ho Scholarship** 2024
- **Cathay Hackathon: 2nd runner-up** (Free ticket to Boston) 2023
- **HKU Foundation Entrance Scholarship** 2021-2022
- **Top in Sindh and Balochistan, GCE A-levels Computer Science** 2020
- **Top in Sindh and Balochistan, GCE A-levels Physics** 2020
- **Best Across Three GCE A-levels, 2nd place in Pakistan** 2020
- **100% Merit Scholarship GCE A-levels, Nixor College** 2018-2020

LEADERSHIP AND VOLUNTEERING EXPERIENCE

New College Programming Society, Co-Founder

Sep 2023 - May 2024

Organized coding workshops and problem-solving sessions for ICPC, and interview preparation.

New College Outdoor Club, Co-Founder

Sep 2022 - Dec 2023

Organized hiking, kayaking, and other outdoor activities to explore Hong Kong.

Events, Culture & Festivals Club, Person-In-Charge

Sep 2023 - Dec 2023

Led a team of 40+ members to organize and coordinate diverse cultural events, e.g. CNY, Eid, Diwali, and Halloween.

REFERENCES

1. **Bruno C.d.S. Oliveira**

Associate Professor, Department of Computer Science
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2. **Ravishankar Ramanathan**

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3. **Eli Barzilay**

Adjunct Lecturer, Khoury College of Computer Sciences
Northeastern University
Senior Software Developer, Microsoft
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