

JAM KABEER ALI KHAN

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

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EDUCATION

Undergraduate

- | | |
|--|--|
| 1. University of Hong Kong
BEng Computer Science with minor in Mathematics
Major GPA: 3.57 | Hong Kong SAR
<i>Expected Graduation: July 2025</i> |
| 2. Northeastern University
BSc Computer Science and Mathematics (Semester Exchange)
GPA: 3.92 | Boston, USA
<i>Spring' 2024</i> |

RESEARCH EXPERIENCE

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|---|--|-------------------------------------|
| Max Planck Institute for Security & Privacy
Research Intern - <i>full-time</i>
Tech: OCaml, Coq | Bochum, Germany
Supervisor: Gilles Barthe | April - Present |
| <ul style="list-style-type: none">• Working on the research of quantum data structures compilation to LLVM which could potentially be represented as Quantum Circuits. | | |
| HKU Programming Languages Group
Undergraduate Thesis
Tech: Haskell & Coq | Supervisor: Bruno C. d. S. Oliveira | Hong Kong SAR
July 24 - April 25 |
| <ul style="list-style-type: none">• Designed & implemented a programming language with <i>first-class</i> environments, capabilities & separate compilation.• Formalized type-directed elaboration to a core calculus in Coq and made a submission to PLDI'25 SRC. | | |
| HKU Quantum Information and Computation Lab
Research Intern - <i>full-time</i>
Tech: Python, Matlab, Julia & CVXPY | Supervisor: Ravi Ramanathan | Hong Kong SAR
June - Aug 24 |
| <ul style="list-style-type: none">• Found Bell's inequality maximally violated by simplex projections, and worked on self-testing proofs.• Certified randomness generation using convex optimization techniques in CVXPY, MATLAB, and Julia. | | |
| HKU Sleep Lab
Student Research Assistant - <i>part-time</i>
Tech: Java, Objective-C, Android Studio, XCode & XML | Supervisor: Shirley X. LI | Hong Kong SAR
April - Oct 22 |
| <ul style="list-style-type: none">• Migrated codebase to AndroidX, integrated ExoPlayer, reduced server load by 80% via caching.• Debugged iOS app, fixed connectivity/audio/video issues, implemented multi-threading for performance. | | |

INDUSTRY EXPERIENCE

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|---|-----------------------------------|
| ActusRayPartners Limited Hedge Fund
Technology Intern - <i>full-time</i>
Tech: Python, MSSql, PyUnit, VBA & Flask | Hong Kong SAR
June - Aug 2023 |
| <ul style="list-style-type: none">• Developed a Python database library , increasing efficiency by 40% with reduced data corruption risk.• Integrated VBA and Flask to enable real-time saving/loading in trade tech, ensuring trader synchronization. | |
| All Round Education Academy
Software Developer (Freelance) - <i>part-time</i>
Tech: JavaScript, ReactJS, NextJS, Redux & TailwindCSS | Hong Kong SAR
March - Nov 2023 |
| <ul style="list-style-type: none">• Developed an Ed-tech revision web app deployed to 30+ users using Redux for caching and dynamic data storage. | |

SELECTED PROJECTS

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| EnvCap - Interpreter Haskell | |
| <ul style="list-style-type: none">• Designed and implemented a programming language with access control using capabilities as first-class modules.• Supporting arithmetic, conditionals, recursion, and algebraic data types with separate compilation. | |
| SLUG - Interpreter Rust - (In-progress) | |
| <ul style="list-style-type: none">• Building an interpreter for a toy programming language in Rust with support for static type checking, algebraic data types and functions etc. | |
| Distributed Consensus Protocol RAFT Python, UDP Sockets | |
| <ul style="list-style-type: none">• Developed a distributed key-value store using the RAFT consensus algorithm.• Ensured data consistency through leader election, log replication, and client request handling. | |

PUBLICATIONS

1. Jam Kabeer Ali Khan.

Capabilities as First-Class Modules with Separate Compilation.

Submitted to PLDI'25 Student Research Competition. Under Review

SKILLS

Programming Languages: **Python, Haskell, Gallina, Java, C/C++, Racket, JavaScript**

Frameworks: **Flask, NextJS, ReactJS, ExpressJS, Flutter, Android Studio, TailwindCSS**

Coursework: Algorithms, Data Structures, Database, Networks, Functional Programming

Programming Languages, Optimization Theory, Multi-variable Calculus, Number theory, etc

AWARDS AND HONORS

- **HKU Undergraduate Entrance Scholarship for Outstanding Academic Talents** 2022, 23, 24
- **HKSAR Government Scholarship Fund** 2021, 22, 23, 24
- **UBS Hackathon:** 3rd runner-up 2024
- **Rosita King Ho Scholarship** 2024
- **Cathay Hackathon:** 2nd runner-up - Won Free Ticket to Boston, USA 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

OTHER EXPERIENCE

Teaching Assistantships

1. COMP2396 Object-oriented Programming and Java Sept - Dec 24
2. COMP2396 Object-oriented Programming and Java Sept - Dec 23
3. ENGG1340 Computer Programming II in C++ Jan - May 22

Leadership Experience and Volunteering

1. New College Programming Society, Founder & President Sep 23 - Dec 24
2. New College Outdoor Club, Founder & President Sep 22 - Dec 23
3. New College Events, Culture & Festivals Club, President Sep 23 - Dec 23