David J. Lee

1333 Paresky
Williamstown, MA 01267
✉ *David.J.Lee@williams.edu*
⌂ *djslzx.github.io*

Education

2017– Present **Williams College**, *Williamstown, MA*.
B.A. Computer Science; Mathematics. Expected June 2021.
GPA: 4.0. GRE: 170vb/170qt

2012–2016 **Asia Pacific International School**, *Seoul, Korea*.
Valedictorian.

Experience

2020– Present **Research Assistant, Data Structures**, *Williams College*.
Mentors: Sam McCauley and Shikha Singh.
- Designed and implemented a novel *adaptive quotient filter* in C.
- Wrote an implementation of the Rank-and-Select quotient filter (RSQF) in C, and augmented it with a compressed representation of adaptivity information.

2019 **Research Assistant, Programming Languages**, *Williams College*, Poster.
Mentor: Stephen Freund. Part of Synchronicity (NSF Grant #1812951).
- Developed and implemented an algorithm to determine the thread-safety of concurrent code via atomicity analysis, using Lipton's theory of reduction.
- System generated valid synchronization disciplines for small- to medium-sized concurrent programs.

2019 **Research Assistant, Knot Theory**, *Williams College*.
- Wrote a combinatorial algorithm in Python to conjecture an upper bound on the number of distinct virtual multi-crossings for a virtual n-crossing, ignoring symmetries.

2018– Present **Teaching Assistant**, *Williams College*.
- Software Methods (Spring 2020)
- Principles of Programming Languages (Spring 2019, Fall 2019, Fall 2020)
- Introduction to Computer Science (Fall 2018)
- Data Structures and Advanced Programming (Spring 2018)

Projects

2020 **A Peer-to-Peer Privacy-Preserving Location-Based Digital Contact Tracing Protocol**.
Designed a digital contact tracing protocol that uses GPS data from cellular devices to alert users of potential virus transmission events without compromising user anonymity. Simulated in Go using Apache Cassandra.

2019 **Functional Hearthstone in Lisp**.
Rewrote the Hearthstone game engine in Clojure following functional programming best practices. The engine core consists entirely of pure functions that are rigorously tested — mutation is limited to the namespace handling the engine's interface with a web view.

2018 **Augmented Reality Drawing for iOS**.
Wrote an iOS application that lets users draw curves in 3D space by moving their devices. Uses ARKit to determine device position from camera data and SceneKit to generate 3D geometries.

Awards

2020	Phi Beta Kappa (Junior Year). Awarded to top 5% of graduating class by GPA.
2020	Ward Prize (Runner-up). Awarded annually to the best student project in the Williams College CS Department.
2018	James Jenkins Lowe Scholarship.

Relevant Coursework

Computer Science	Machine Learning, Distributed Systems, Functional Programming, Software Methods, Programming Languages, Algorithms, Computer Organization, Data Structures
Mathematics	Real Analysis, Abstract Algebra, Knot Theory, Probability, Linear Algebra, Differential Equations, Multivariable Calculus

Skills

Programming Languages	Python, C, Java, Scala, Go, Clojure/ClojureScript
Natural Languages	English (Native), Korean (Proficient), Chinese (Intermediate)