

Biographical Information

Keith Schwarz
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(650) 723-4350
Gates 178

Academic History

Stanford University

MS, Computer Science (June 2011)
BS, Computer Science, with Distinction; Minor in Mathematics (June 2011)

Employment Record

Lecturer, Computer Science Department, Stanford University (September 2011 – Present)

Courses: CS9, CS103, CS103A, CS106A, CS106B, CS143, CS161, CS166.

Total Students Taught: 7,584.

Advisees (Masters and Undergraduate): 107 current, 108 former.

New Courses Introduced: CS9 (with Cynthia Lee), CS103A, CS166.

Student-Initiated Courses Sponsored: CS42.

SCPD Courses Taught: CS103, CS106A, CS106B, CS143, CS161.

Software Engineering Intern, Palantir Technologies (June 2010 – September 2010)

Platform Intern, Mozilla Corporation (June 2008 – September 2008)

University and Departmental Service

Member, Undergraduate Advisory Council (September 2017 – Present)

Guest-in-Observance, Academic Progress Review Board (September 2016 – June 2017)

Instructor, Girl Code @Stanford (June 2013 – Present)

Summer program teaching introductory programming to high-school girls, primarily from underrepresented minorities. Roughly 40% of students go on to take a CS class in their first year of college; roughly 25% of students declare CS within their first two years of college.

Student Group Faculty Advising
CS + Social Good, Women in Computer Science

Awards and Honors

Tau Beta Pi Teaching Honor Roll (Stanford, 2017)

Walter J. Gores Award (Stanford, 2015)
Stanford's highest teaching award.

Stanford Society of Latino Engineers Faculty Member of the Year Award (Stanford, 2015)

CS Department Distinguished Service Award (Stanford, 2014)

JSK Journalism Fellowship Favorite Professor Award (Stanford, 2013)

Tau Beta Pi Award for Excellence in Undergraduate Teaching	(Stanford, 2012)
Stanford Society of Women Engineers Professor of the Year Award	(Stanford, 2012)
Henry Ford II Scholar	(Stanford, 2010)
George Forsythe Memorial Award	(Stanford, 2010)
Frederick Emmons Terman Award	(Stanford, 2010)

Bibliographical Information

Conference Publications

Eric Roberts, *Keith Schwarz*, “A Portable Graphics Library for Introductory CS,” (2013)
ITiCSE '13, pp. 153 – 158, 2013.

Describes architecture and advantages of the graphics package used in Stanford’s CS106B and CS106X courses.

Nick Parlante, Julie Zelenski, *Keith Schwarz*, Dave Feinberg, Michelle Craig, Stuart Hansen, (2011)
 Michael Scott, and David J. Malan, “Nifty Assignments,” *SIGCSE '11*, pp. 491 – 492, 2011.

Introduced assignment “Evil Hangman,” which has since been adopted at UC Berkeley, University of Washington, Harvard, Duke, and many other CS programs.

Unrefereed Online Publications

“Darts, Dice, and Coins: Sampling from a Discrete Distribution,” (December 2011)
<http://www.keithschwarz.com/darts-dice-coins/>.

A comparison of approaches to sampling from a discrete probability distribution. Approximately 150,000 views.

“Generating Subsets Lexicographically with Binary Numbers and Cyclic Shifts,” (March 2011)
<http://www.keithschwarz.com/binary-subsets/>.

An algorithm for generating subsets in lexicographical order using bitwise manipulations. Approximately 30,000 views.

“Smoothsort Demystified,” <http://www.keithschwarz.com/smoothsort/>. (January 2011)

Derivation and exposition of Dijkstra’s smoothsort algorithm. Approximately 45,000 views.

“Archive of Interesting Code,” <http://www.keithschwarz.com/interesting/>. (January 2010 – Present)

Detailed descriptions and implementations of classic algorithms and data structures. Approximately 600,000 views.

Invited, Non-Refereed Presentations

“Getting Started in Computer Science,” LinkedIn Kids In Coding, Sunnyvale, CA. (October 2016)

Keynote at an introductory programming event for the Boys and Girls Club hosted at LinkedIn.

- “Getting Started in Computer Science,” Eastside Preparatory High School, East Palo Alto, CA. *(October 2015)*
Kickoff to the school’s Hour of Code event through Code.org.
- “Designing Inclusive Engineering Courses,” Year of Learning Teaching Ideas Showcase, Stanford, CA. *(October 2015)*
Discussion of techniques for building a welcoming engineering classroom supportive to students of all backgrounds.
- “Getting Started in Computer Science,” LinkedIn Kids In Coding, Sunnyvale, CA. *(October 2015)*
Keynote at an introductory programming event for the Boys and Girls Club hosted at LinkedIn.
- “All About Passwords,” CSI LEAD, Stanford, CA. *(July 2015)*
Exploration of exciting topics in computer science, such as zero-knowledge proofs and muscle-memory passwords.
- Panelist, she++ Documentary Premiere, Stanford, CA. *(April 2013)*
- “Darts, Dice, and Coins,” Stanford ACM Tech Talks, Stanford, California. *(January 2012)*
Derivation of the alias method for sampling from a discrete distribution.
- “Fun with Number Systems,” University of Pennsylvania, Philadelphia, PA. *(April 2011)*
- “Fun with Number Systems,” Cornell University, Ithaca, NY, *(April 2011)*
Sample lecture. Exploration of algorithms motivated by number systems, such as finding a mismatched item on a balance and generating permutations.

Course Readers

- CS103 Course Reader “Mathematical Foundations of Computing.” (351p) *(June 2013)*
Introduction to discrete structures and mathematical proof. Used in CS103.
- CS106L Course Reader. (548p) *(June 2009)*
Exploration of the C++ language aimed at introductory CS students.

Other Media

- “Binary, Hanoi, and Sierpinski,” YouTube, <https://youtu.be/2SUvWfNJSsM>. *(November 2016)*
Explores the connection between the binary and ternary number systems, the Towers of Hanoi problem, and Hamiltonian paths in Sierpinski graphs. Collaboration with YouTuber [3blue1brown](#). Approximately 130,000 views.
- Featured in “The She++ Documentary,” YouTube, <https://youtu.be/DqrfPCGo2aQ>. *(February 2013)*
Approximately 100,000 views.
- Interviewed in BBC Radio 5 show “Outriders.” *(November 2011)*
Describing project “Archive of Interesting Code.”

Miscellaneous

- Rank ~#130 on Stack Overflow (username: `templatetypedef`).
Top answerer in [algorithms] and [data-structures] tags. Top-ranked answers on LL/LR parsing techniques, pseudopolynomial time, the $\Omega(n \log n)$ sorting barrier, Fibonacci heaps, and Fenwick trees. Answers viewed approximately 11.3 million times.