

Bilal Shaw

Work Address

Communication Science Institute
Department of Electrical Engineering
University of Southern California
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Education:

University of Southern California, Los Angeles, CA
PhD candidate in Computer Science, 2004 -

University of Southern California, Los Angeles, CA
M.S. in Computer Science, May 2004

University of Southern California, Los Angeles, CA
B.S. in Computer Science, May 2002

Whittier College, Whittier, CA
B.A. in Mathematics, May 2002

Research Interests:

Quantum information theory; Quantum Algorithms; Nanotechnology; High Performance Computing; Financial Mathematics

Selected Course Work:

Quantum Information Theory (4 courses), High Performance Computing (3 courses), Cryptography (2 courses), Numerical Analysis, Algorithms,, Mathematical Logic, , Embedded Systems, Web Technologies,.

Programming Languages:

C/C++, Java,, Maple, Matlab

Work Experience:

Teaching Assistant, Fall 2005 – Fall 2007

Computer Science Department
University of Southern California,

- TA for a freshman level class on C, Fall 2005
- TA for discrete mathematics, Spring 2006 (Dr. Wilczynski)
- TA for a graduate level web technologies course, Summer 2006 (Dr. Crowley)
- TA for discrete mathematics, Fall 2006 (Dr. Wilczynski)
- TA for discrete mathematics, Spring 2007 (Dr. Huang)
- TA for web technologies, Summer 2007 (Dr. Crowley)
- TA for discrete mathematics, Fall 2007 and Spring 2008 (Dr. Wilczynski)

Evangelist, Sun Microsystems, Spring 2006

- Promoting Sun Technologies at the University of Southern California

Southwest Quantum Information Technology Workshop ([SQUINT](#)), USC, CA, Summer 2005

Organized SQUINT-2005 with my advisor Dr. Todd Brun.

Computing Beyond Silicon Summer School, Caltech, CA, Summer 2004

Organized CBSSS-2004. I was the student coordinator for the summer school. My work included getting in touch with lecturers, organizing lecture notes/papers and interacting with students on projects.

([CBSSS - 2004](#))

Research Assistant, Fall 2004 –

Computer Science Department,
University of Southern California,
Supervisor: Professor Todd Brun

- Quantum Information Theory
- Currently working on a C++ software library that will be used in the future to simulate quantum communication and quantum information protocols.
Schack, R., Brun, T. "[A C++ library using quantum trajectories to solve quantum master equations.](#)"
I am also working on a quantum version of classical steganography.

Research Assistant, 2000 - 2004

Computer Science Department,
University of Southern California,
Supervisor: Professor Leonard Adleman

- Built nanoscale biological components via self-assembly of DNA.
- Visualized and characterized DNA nanocrystals via atomic force microscopy techniques.
- Studied and researched theoretical self-assembly.
- Worked on developing ultra-sensitive single molecule detection systems ("exquisite detection").
- Designed the lab's website.

Summer Student, 2002

Computing Beyond Silicon Summer School (CBSSS-2002)
Caltech

- Attended CBSSS-2002 at Caltech, where unconventional models of computing were looked into. Completed a project on Algorithmic Self Assembly of Electrical Circuits and published a paper that appeared in a Caltech report.

Teaching Assitant/Tutor, 2000-2002

Engineering and Computer Science Department,
University of Southern California

- Engineering Peer Tutoring Program: Tutored engineering students in calculus I, II, III, differential equations, linear algebra, physics, and C++
- Teaching assistant / Grader for an undergraduate web programming class

Teaching Assistant/Tutor, 1997-1999

Mathematics Department,
Whittier College

- Mathematics **Tutor and Grader** for Calculus I and II.
- Tutored an autistic student at Whittier College in Pre-calculus.

Tutor, 1999

English Department,
Whittier College

- Tutored/helped students with papers at the writing center in Whittier College.

Web Page Designer, 1999

Mathematics Department,
Whittier College

- Designed the mathematics department's website.

Research Assistant, Summer 1998

Physics Department,
Whittier College

- Research Assistant in NMR Lab in the Physics Department. Summer 1998
- Designed and tested programs using **LabView®** GPIB programming
- Instruments included digital low temperature thermometers and frequency modulators. The thermometer automatically shut down its operations once the temperature went above the critical point.

Awards and Honors:

- Dean's List Whittier College
- Rotary Club Scholarship nominee
- **Sigma Pi Sigma** Physics Honor Society
- John Greenleaf Whittier Scholarship
- Washington University Academic Scholarship St. Louis
- Presidential Scholarship at USC
- W.V.T. Rusch Undergraduate Honors program at USC (2000-01)
- Fredericka Gordon Scholarship at USC
- **Upsilon Pi Epsilon** Computer Science Honor Society
- Best student presentation/paper in quantum information theory. APS March meeting, New Orleans, 2008

Activities and Organizations:

William Penn Society, Whittier College Choir, USC Concert Choir, Orientation Week Leader at Whittier College, Whittier College Math Club, Society of Physics Students at Whittier College, Mathematical Association of America, American Physical Society

Publications:

- Shaw, B.; Wilde, Mark M.; Oreshkov, O.; Kremsky, I.; Lidar, D. **Encoding One Logical Qubit Into Six Physical Qubits.** (*Sent to Physical Review A*). 2008

- Reishus, D.; Shaw, B.; Brun, Y.; Chelyapov, N.; Adleman, L. **Self-Assembly of DNA Double-Double Crossover Complexes into High Density, Doubly-Connected, Planar Structures.** *Journal of American Chemical Society*, 2005.
- Chelyapov, N.; Brun, Y.; Gopalkrishnan, M.; Reishus, D.; Shaw, B.; Adleman, L. **DNA Triangles and Self-Assembled Hexagonal Tilings.** *Journal of American Chemical Society*, 2004.
- Brun, Y., Gopalkrishnan, M., Reishus, D., Shaw, B., Chelyapov, N., and Adleman, L. Building Blocks for DNA Self-Assembly. In FNANO 2004, Foundations of Nanoscience: Self-Assembled Architectures and Devices, (Snowbird UT), April 21-23, 2004.
- Mattmann, C.; Shaw, B. [A Resource Aware Software Architecture Featuring Device Synchronization and Fault Tolerance.](#) *In Proceedings of the 2nd IADIS International Conference on WWW/Internet, Algarve, Portugal, November 5th-8th, 2003.*
- deLorimier, M.; Mathy, A.; Reishus, D.; Schmidt, R.; Shaw, B.; Wong, L. C. [Algorithmic Self-Assembly of Circuits.](#) *In CBSSS-2002 final report, California Institute of Technology.*