

# Vita for Shai Simonson

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## Education

### **Graduate School of Northwestern University, Evanston, IL**

Ph.D. in Computer Science, August 1986

Study funded by Royal E. Cabell Fellowship

M.S. in Computer Science, June 1982

Honorable Mention in 1980-1981 NSF Student Fellowship Competition

### **Columbia College of Columbia University, New York, NY**

B.A. in Mathematics, May 1979

Van Am Mathematics Prize

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## Employment

### **Computer Science Department, Stonehill College, North Easton, MA**

Full Professor, 2000 – present (Acting Chair 2005, 2012)

Associate Professor, 1994 – 1999

Assistant Professor, 1991 – 1993

### **Department of Computer Science, University of Illinois, Chicago, IL**

Visiting Full Professor, 2013 – 2014

Assistant Professor, EECS Department, 1986 – 1990

### **Ida Crown Hebrew High School, Chicago**

Visiting Scholar, Mathematics, 2013 – 2014, (Funded by Shay grant and Stonehill College)

Computer Science Teacher, 1983 – 1985

**Neumont University, South Jordan, UT**

Adjunct Professor, Computer Science Department, Summer 2012

**ArsDigita University, Cambridge, MA**

Full Professor and Director, 2000 – 2001

**South Area Solomon Schechter, Middle School, Stoughton, MA**

Advanced Mathematics Program and Math Team Coach, 1999 – 2007

**Mathematics Department, Hebrew University, Jerusalem, Israel**

Visiting Professor, 1998 – 1999

**EECS Department, Northwestern University**

Lecturer, 1983 – 1985

**Computer Science Department, Tel Aviv University, Tel Aviv, Israel**

Visiting lecturer, 1982 – 1983

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## **Publications**

### **Refereed Journals**

- [A Variation on the Min Cut Linear Arrangement Problem](#), *Theory of Computing Systems*, 20 pp. 235-252 (1987).
- [Routing with Critical Paths](#), *Info. Proc. Letters*, Vol. 34, pp. 13-19 (1990).
- [Single Tree Grammars](#), with Sheila Greibach and Weiping Shi, *Theoretical Studies in Computer Science*, edited by J. Ullmann, Academic Press pp. 73-100 (1992).
- On the Complexity of Tree Embedding Problems, with I. H. Sudborough, *Info. Proc. Letters*, Vol. 44, pp. 323-328 (1992).

- [Geography](#), with A. Fraenkel, *Theoretical Computer Science A*, Vol. 110, pp. 197-214 (1993).
- [Gems of Levi ben Gershon](#), *Mathematics Teacher*, **93**, 8, pp.659-663 (November 2000).
- The Missing Problems of Gersonides – A Critical Edition, Part I, *Historia Mathematica*, Vol. 27, No. 3, pp. 243-302 (August 2000). [Main paper with translation.](#) [Hebrew text.](#)
- The Missing Problems of Gersonides – A Critical Edition, Part II, *Historia Mathematica*, Vol. 27, No. 4, pp. 384-431 (November 2000). [Main paper with translation.](#) [Hebrew text.](#)
- [The Hebrew Mathematical Tradition](#), with T. Langermann, for *Mathematics Across Cultures: A History of Western Mathematics*, editor Helaine Selin, Kluwer Publishing, 2000. (Online version corrects some typos in published version).
- [The Mathematics of Levi ben Gershon](#), *Bekhol Derakhekha Daehu* **10**, Bar-Ilan University Press, pp. 5-21, Winter 2000.
- [Communication Methods](#), In *Mathematics*, ed. Barry Max Brandenberger, Jr. New York: Macmillan Reference USA, 2002.
- [A Combinatorial Card Trick](#), with Tara S. Holm, *PRIMUS*, Volume XIII, Number 3, pp. 248-269, September 2003.
- [A Post-Baccalaureate Undergraduate Level Program in Computer Science](#), On-Site Article, *Communications of the ACM* **Volume 45**, **No. 7**, pp. 21-24, July 2002.
- [Mathematics and Computer Science: Exploring a Symbiotic Relationship](#), with Ralph Bravaco, *Mathematics and Computer Education*, Volume 38, No. 3, pp. 307-317, Fall 2004.
- [Public-Key Cryptography](#), *From Calculus to Computers: Using the Last 200 Years of Mathematical History in the Classroom*, editors Richard Jardine and Amy Shell, MAA Notes, Volume 68, November 2005.
- [Knowledge Change in Computer Science](#), *Journal of Computer Science Education*, with Jane Nash and Ralph Bravaco, Volume 16, Number 1, March 2006.
- [A Rabbi, Three Sums, and Three Problems](#), in [Resources for Teaching Discrete Mathematics](#), ed. Brian Hopkins, MAA Notes, Volume 74, 2009. ([Final galley changes](#))

### Conference Papers and Papers Read

- NP-Complete Problems with Bandwidth Constraints, *Computer Science Seminar*, Tel Aviv University (1983).

- On the Complexity of Binary Tree Embeddings, with I. H. Sudborough, *15th Southeastern Conference on Combinatorics, Graph Theory and Computing*, Baton Rouge (1984).
- The Complexity of Planar Graph Problems, *UIC EECS Forum*, (1987).
- Parallel Matrix Multiplication, *UIC EECS Forum*, (1988).
- The Complexity of Graph Layout Problems, *UIC EECS Forum*, (1989).
- A Variation on the Game Geography, with J. Vilimek, *Proceedings Argonne Symposium for Undergraduates in Science, Engineering and Mathematics*, No. 26 (1990).
- What Machines Cannot Do - Teaching Undergraduate Theory of Computation, *Teaching Seminar*, Duke University, (1993).
- Levi ben Gershon and Early Uses of Mathematical Induction, with Zeev Barel, *Institute in History of Mathematics*, Washington, DC, (1996).
- Using Medieval Mathematics in Teaching History of Mathematics, *Institute in History of Mathematics*, Washington, DC, (1997).
- Levi ben Gershon and Reading Manuscripts, *Institute in History of Mathematics*, Washington, DC, (1997).
- History of Mathematical Ingenuity, *Mathematical Association of America Mathfest*, Atlanta, (August 1997).
- Maaseh Hoshev - The Arithmetic, Algebra and Combinatorics of Levi ben Gershon, *Regional Meeting of the American Mathematical Society*, Montreal, (September 1997).
- The Mathematics of Levi ben Gershon, *Joint Mathematics Meeting AMS/MAA*, Baltimore, (January, 1998).
- Math of Levi ben Gershon, *Mathematics Lecture*, Stonehill College, (April 1998).
- Square Root Algorithm of Levi ben Gershon, *Invited Lecture Suffolk Community College*, (April 1998).
- Some Unpublished Problems of Levi ben Gershon, *Yom Iyun - Some Leaves from the Scientific Jewish Bookcase*, Hebrew University, Jerusalem, (December 1998).
- The Mathematics of Levi ben Gershon, *Invited Lecture*, Jerusalem College of Technology, Jerusalem (May, 1999).
- Decisive Mathematical Developments of the 20<sup>th</sup> Century, Stonehill College, November 1999.
- Series of Lectures on Using Medieval Mathematics in the Classroom, *Invited Lectures*, MAA/NSF Symposium for Secondary School Mathematics Teachers, Washington DC, July 2001.
- [A Combinatorial Card Trick](#), *Invited Lecture*, Proceedings IWHIT, University of Aizu, March 2002.

- [Math in Unexpected Places](#), Invited Lecture, Mass Gamma Chapter of Pi Mu Epsilon Induction Ceremony, Bridgewater State College, April 2004.
- [Technology in the Classroom](#), Invited Lecture, South Area Solomon Schechter Day School, February 2008.
- [Levi ben Gershon's Matrix Algebra](#), [Parma Source](#), Special Session on History and Philosophy of Mathematics at the AMS Eastern Section Meetings at the College of the Holy Cross in Worcester, Massachusetts on April 10, 2011. [Abstract](#).

## Books

- [Java Programming - From the Ground Up](#), with Ralph Bravaco, McGraw Hill, (February 2009).
- [Rediscovering Mathematics](#), MAA, (March 2011).

## Other Publications

- NP-Complete Problems with Bandwidth Constraints, *Masters Thesis*, Northwestern Univ. Lib., (1983).
- Layout Problems on Trees, *Ph.D. dissertation*, Northwestern University Library (1986).
- Computers and Poets, letter to *Commentary Magazine*, Vol. 82, No. 2 (1986).
- Computer Go, *UIC-IEEE Newsletter*, Vol 2, No. 3 (April 1987).
- Pythagorean Theorem, Letter to *Mathematics Teacher*, Vol. 84, No. 2, pp. 148 (February 1991).
- [How to Read Mathematics](#), *Stonehill Writes*, Vol. 6, 3, Stonehill College Press, pp.11-17 (1993).
- [Emblems of Mind](#), Book Review for *MAA Online* (1996).
- [Dissection Proofs of the Pythagoras' Theorem Using an Inscribed Circle](#), Cut-the-Knot website
- [Paulo Porta version of the Above Proof](#)
- [How to Read Mathematics, Hacker Monthly](#), Issue 5, October 2010.

## Unpublished Manuscripts

- Bravaco, Ralph and Simonson, Shai, From Pascal to C++ - A Workshop for Secondary School Teachers of Computer Science, Distributed at Stonehill College Summer C++ Workshop (1998-1999).
- Bravaco, Ralph and Simonson, Shai, Java and Object-Oriented Programming - A Workshop for Secondary School Teachers of

Computer Science, Distributed at Stonehill College Summer Java Workshop (Summer 2003).

## **Books in Preparation**

- How Computers Work: an Introductory Programming Text for Non-majors using Logo.

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## **Grants and Awards**

### **National Science Foundation**

- National Science Foundation Research Initiation Grant, *Communication Costs in Hypercube Multiprocessors*, 1987-1989, \$60,000.
- National Science Foundation NSFNET Program, with Ray Pepin, *Internet Connection for Stonehill College*, 1992-1995, \$32,000.
- National Science Foundation ILI Program, *A Graphics Based Algorithm Analysis Laboratory*, 1994-1996, \$30,000.
- National Science Foundation Teacher Enhancement Program, *Integrating Object-Oriented Programming into the High School Curriculum*, with Ralph Bravaco, 1998-2000, \$98,000.
- National Science Foundation Science and Technology Studies, *A Critical Edition of Levi ben Gershon's Maaseh Hoshev*, 1999-2001, \$75,000.
- National Science Foundation, Java Workshop for Secondary School Teachers, with Ralph Bravaco, 2003-2005, \$167,000.
- National Science Foundation, Mathematical Experiments in Computer Science, with Ralph Bravaco, 2006-2008, \$140,000, not funded.
- National Science Foundation, Mathematical Discovery Laboratories, 2011- 2014, \$225,000, not funded.

### **Teaching Awards**

- Computer Science Department Nominee for University of Illinois Silver Circle Teaching Award, 1988.
- Certificate of Recognition from UIC Student Research Opportunity Program, 1989.

### **Other Grants**

- University of Illinois at Chicago Campus Research Board, *An Expert System to Play GO*, 1988, \$5000.
  - Stonehill College Summer Grant, *Course Design - How Computers Work*, 1992, \$2500.
  - Stonehill College Small Grants, *Course Design - History of Mathematical Ingenuity*, 1993, \$400.
  - Stonehill College Manuscript Grant, *Algorithms by Experiment*, 1993, \$500.
  - Stonehill College Summer Grant, Translating Maaseh Hoshev of Levi ben Gershon, 1997, \$1600.
  - Stonehill College Summer Grant, *Course Design - Mathematical Experiments Using Computers, a Learning Community*, 2002, \$1100.
  - Shay Grant, Mathematical Discovery Labs, with Dr. Jeremy Kahan, Ida Crown Jewish Academy, 2013 - 2014, \$40,000.
  - Mathematical Association of America - Dolciani Grant, Mathematical Discovery Laboratories, 2013 - 2014, \$6,000, not funded.
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## **Courses Taught**

### **Undergraduate Mathematics**

Calculus I, Calculus II, Techniques of Calculus, Discrete Mathematics, Graph Theory, History of Mathematical Ingenuity, Mathematics for Educators.

### **Undergraduate Computer Science**

How Computers Work, Introduction to Computer Programming I and II, Data Structures, Algorithms and Complexity, Digital Logic Design, Machine Organization and Assembly Language Programming, Computer Architecture, Theory of Computation, Artificial Intelligence, Programming Languages, Data Bases.

### **Graduate Mathematics and Computer Science**

Complexity Theory, Combinatorial Optimization, Automata Theory, Graph Theory, Algorithms.

### **Theses Advising**

21 Bachelor's Theses, 3 Master's Theses.

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## **Activities and Memberships**

- SIGCSE Committee on the Implementation of a Discrete Mathematics Course, 2003.
- Listed in American Men and Woman of Science, 2002 - present.
- ACM 2001 Curriculum Task Force for Foundations of Computer Science, 1999-present.
- MAA Mathfest Program Committee, Summer 1999.
- Founder and Faculty Advisor of the Stonehill College Chess Club, 1996-present.
- Faculty Advisor for the Stonehill College Student Chapter of the ACM, 1991-present.
- Reviewer for: PWS-Kent, Prentice Hall, McGraw Hill, CRC Press, and Oxford University Press, 1986-present.
- Referee for: IEEE Trans. on Software Eng., IEEE Trans. on Computing, IEEE Software, Theoretical Computer Science, Kluwer Academic Publishing, Compsac, American Mathematical Monthly, Adv. Appl. Math, 1986-present.
- Founder and Faculty Advisor of the University of Illinois at Chicago (UIC) Go Club, 1986 - 1990.
- Chaired the UIC Computer Science Forum - A Weekly Research Seminar, 1986 - 1990.
- Chair, Committee to Revise the Undergraduate Computer Science Curriculum at UIC, 1989.
- Faculty Mentor for the UIC Student Research Opportunity Program, 1988.
- Member Mathematical Association of America (MAA), 1986 - present.
- Member Association of Computing Machines (ACM), 1983 - present.

### **Stonehill Committees and Service**

- Merit Committee (3 years)
- Intercultural Affairs Committee (6 years)
- Academic Standing Committee (2 years)
- Goldwater Fellowship Committee (3 years)
- Small Grants Committee (4 years)
- Catholic Jewish Dialogue Program
- Ad-hoc Computer Assessment Committee (1 year)
- Rank and Tenure Committee (1 year)
- Honors Program Committee (2 years)
- Rank and Tenure Committee (6 years - current)

- Faculty Mentor (2 years)
  - Community Associate for Residence Halls (1 year)
  - Strategic Planning Committee (1 year-current)
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## **Hobbies**

Go, Bridge, Bicycling, Hiking, Cantorial Chanting, Disc Golf.