

# CURRICULUM VITAE

**Dr. Ran Libeskind-Hadas**

R. Michael Shanahan Professor of Computer Science

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## EDUCATION

**Ph.D.** Computer Science, University of Illinois at Urbana-Champaign, 1993

Ph.D. thesis (under C. L. Liu): *Reconfiguration of Fault Tolerant VLSI Systems*

**M.S.** Computer Science, University of Illinois at Urbana-Champaign, 1989

M.S. thesis (under C. L. Liu): *Neural Network Solutions to Two VLSI Design Problems*

**B.A.** Applied Mathematics, *magna cum laude*, Harvard University, 1987

Undergraduate thesis (under Petros Maragos): *An Application of Iterated Function Systems and Skeletonization to the Modeling of Fractal Images*

## RESEARCH INTERESTS

Design and analysis of algorithms

Computational biology

## AWARDS

2012 Distinguished Alumni Educator Award

University of Illinois at Urbana-Champaign, Department of Computer Science

Joseph B. Platt Endowed Chair, Harvey Mudd College 2005-2009

Endowed five-year faculty chair for effective teaching

Iris and Howard Critchell Assistant Professorship, Harvey Mudd College, 1996-1999

Endowed junior faculty chair for teaching and mentoring

C. William Gear Outstanding Graduate Student Award, Inaugural Award, 1991

"Awarded annually to a graduate student in the Department of Computer Science at the University of Illinois at Urbana-Champaign on the basis of demonstrated excellence in research and service"

GTE Graduate Fellowship, 1987-1993

## ACADEMIC POSITIONS

Department Chair, Department of Computer Science, Harvey Mudd College, July 2011-present

Associate Dean of Faculty, Harvey Mudd College, July 2009- July 2011

Acting Department Chair, Department of Computer Science, Harvey Mudd College, July 2006-  
July 2007

Professor, Department of Computer Science, Harvey Mudd College, July 2003-present

Associate Professor, Department of Computer Science, Harvey Mudd College, July 1999-July 2003

Assistant Professor, Department of Computer Science, Harvey Mudd College, May 1994-July 1999

Assistant Professor, Department of Mathematics, Harvey Mudd College, August 1993-May 1994

## VISITING AND ADJUNCT POSITIONS

Visiting Professor, Department of Electrical Engineering and Computer Science, MIT, Academic  
Year 2013-14.

Visiting Scholar, School of Information Technology, University of Sydney, Australia, Academic  
Year 2007-8.

Visiting Researcher, Department of Computer Science, Department of Computer Science, Uni-  
versity of Pittsburgh, March – August 2000

Visiting Scientist, Department of Computer Science, Technion - Israel Institute of Technology,  
August 1999 – March 2000

Visiting Lecturer, Department of Computer Science, University of Illinois at Urbana-Champaign,  
Summer 1992 and Summer 1993

## GRANTS

*Workshops to Engage Junior Faculty in Undergraduate Research*

October 2013 - September 2015

(with Nancy Amato and Andrew Bernat)

\$36,118

*CPATH-2: Modular CS 1 from the Inside Out: Computational Thinking for all STEM Students*

September 2009 - August 2012

(with Christine Alvarado, Zach Dodds, and Geoff Kuenning)  
\$797,692

*Computing Innovation Fellows Project*

May 2009 - April 2013

(co-PI with PI Peter Lee and co-PI's Anita Jones and Rangachar Kasturi)

\$14,988,394

*REU Site: Harvey Mudd REU Site on Computer Systems*

National Science Foundation Research Experience for Undergraduates (REU) Grant

Division of Information and Intelligent Systems

(with co-PI Melissa O'Neill)

May 2008 - April 2011

\$292,921

*Preparing New Scientists and Engineers for the 21st Century*

National Science Foundation S-STEM Program

Division of Undergraduate Education

September 2007 - August 2012

(co-PI with PI Peter Saeta and co-PI's Nancy Lape, Robert Cave, and David Asai)

\$579,600

*REU Site: Harvey Mudd REU Site on Artificial Intelligence, Systems, and Optical Networking*

National Science Foundation Research Experience for Undergraduates (REU) Grant

Directorate for Computer and Information Science and Engineering

May 2005 - April 2008

\$286,209

*Virtual Topologies for Multicast Communication in WDM Networks*

National Science Foundation RUI Grant

Advanced Networking Infrastructure and Research (ANIR) Directorate

June 2002 - May 2005

\$170,500

*Efficient Collective Communication in Switch-Based Networks of Workstations*

National Science Foundation RUI Grant

Computer-Communications Research (CCR) Directorate

May 1999 - April 2002

\$174,000

*Development of a Multimedia Course on the Geometry of Curves and Surfaces with Applications to Computer Aided Geometric Design*

Co-Investigator with W. Gu and M. Moody

Mellon Foundation Small Grants Program

May 1997 - September 1997

\$10,350

*Scientific Visualization in the Introductory Computer Science and Mathematics Curricula*  
Principal Investigator with co-investigators R. Bull, B. Keller, M. Moody, and W. Tam  
Mellon Foundation Small Grants Program  
January 1996 - February 1997  
\$16,600

*Deadlock-Free Fault Tolerant Routing in Wormhole-Routed Multicomputers*  
National Science Foundation RUI Grant  
Computer-Communications Research (CCR) Directorate  
March 1995 - April 1998  
\$98,079

## RECENT TALKS

Since 2009

Amherst College, Boston University, Claremont Graduate University, École Polytechnique Fédérale de Lausanne, MIT, University of Connecticut, Sanger Genome Center, Williams College, UC Riverside, UC San Diego, University of Oregon, University of Pittsburgh

## PROFESSIONAL ACTIVITIES

**National Committees:** Member of the NSF-CRA Computing Community Consortium (CCC) Interim Council 2006-2007, Member of the CCC Council 2009-2015, Co-Chair CRA-E 2011-present.

**Editorial Board:** Member of the Editorial Board of the IEEE Transactions on Computers (two terms, 2001-2005)

**Program and Organizing Committees:** 2011, 2012, 2013, 2014 RECOMB-BE, 2010 OPTICS, International Conference on Optical Communication Systems, 2008 International Conference on Computer Communications and Networks, 2008 International Conference on Parallel Processing, 2006 International Conference on Communications and Networking in China, 2004 International Conference on High Performance Computing, 2004 International Conference on Parallel and Distributed Computing and Networks, 2003 International Conference on Parallel Processing, 2003 International Conference on Parallel and Distributed Computing and Systems, 2003 International Conference on High Performance Computing, 2002 International Conference on Computer Communications and Networks, 2002 International Conference on Parallel Processing, 2002 International Conference on Parallel and Distributed Computing and Systems, 2001 International Conference on Computer Communications and Networks, 2001 International Conference on Parallel and Distributed Computing and Systems, 2000 International Conference on Parallel Processing, 2000 International Conference on Parallel and Distributed Computing and Systems, 1995 IEEE International Workshop on Defect and Fault Tolerance in VLSI Systems

**Grant and Advisory Panels:** Panelist for the NSF CISE, NSF MIPS, HHMI

## TEACHING ACTIVITIES AT HARVEY MUDD

**Courses Taught:** Mathematics 55 (*Discrete Mathematics*), Mathematics 73 (*Linear Algebra*), Computer Science 5 (*Introduction to Computer Science*), Computer Science 60 (*Principles of Computer Science*), Computer Science 140 (*Algorithms*, cross-listed as Mathematics 168), Computer Science 141 (*Advanced Topics in Algorithms*), Computer Science 142 (Complexity Theory, cross-listed as Mathematics 167), Computer Science 155 (*Computer Graphics*), Mathematics and Biology 118 (*Introduction to Mathematical and Computational Biology*)

**Clinic Projects:** Supervised 17 year-long clinic projects (undergraduate research and development projects sponsored by industrial partners)

**Senior Theses:** Supervised or co-supervised 20 senior theses in computer science, mathematics, and computational biology

**Summer Research Students:** Supervised 44 summer research students

**Ph.D. Dissertation Committees:**

- Ms. Honge Wang, Electrical and Computer Engineering, University of California at Irvine,
- Mr. Raymond Moberly, Computational Science, Joint Doctoral Program of San Diego State University and Claremont Graduate University

## COLLEGE SERVICE

**Faculty Executive Committee:** Three terms. 1997-1998, 1998-2000, 2001-2003

**Reappointment, Promotion, and Tenure Committee:** Three terms. 2003-2005, 2005-2008 (Chair, 2004-2005), 2008-2011

**Claremont Colleges Committee on Religious Activity:** 2001-2002

**Faculty Ad Hoc Committee on Excellence:** 2003 (Chair)

**Watson Fellowship Selection Committee:** 1995-2000, 2001-2011 (Chair 1998-1999)

**Computing Committee:** 1994-1995

**Committee on Scholarly Standing:** 1995-1996

**Committee on Teaching and Learning:** 1995-1997

**Faculty Liaison to the Trustee Development Committee:** 2004

**Presentation Days Committee:** 1994-1996 (Chair)

**Bruce J. Nelson Distinguished Speaker Series:** Organizer 2004-2005

## PUBLICATIONS

Italicized names indicate undergraduate student authors

### Books

1. R. Libeskind-Hadas, N. Hasan, J. Cong, P. McKinley, and C. L. Liu. *Fault Covering Problems in Reconfigurable VLSI Systems*. Kluwer Academic Publishers, Boston, 1992.
2. R. Libeskind-Hadas and E. Bush. *Computing For Biologists*. Cambridge University Press, to be published in Spring 2014.

### Book Chapters

3. M. Charleston and R. Libeskind-Hadas, "Cophylogenetic Comparative Analysis," in *Modern Phylogenetic Comparative Methods and their Application in Evolutionary Biology*, László Szolt Garamszegi editor. Springer-Verlag, to appear.
4. R. Libeskind-Hadas, "Figs, Wasps, Gophers, and Lice: A Computational Exploration of Coevolution," in *Bioinformatics for Biologists*, P. Pevzner and R. Shamir, editors. Cambridge University Press, 2010.

### Journal Papers

5. R. Libeskind-Hadas and E. Bush, "A First Course in Computing with Applications to Biology," *Briefings in Bioinformatics*, 2013, DOI: 10.1093/bib/bbt005.
6. A. Cruaud, N. Ronsted, B. Chantarasuwan, L.S. Chou, W. Clement, A. Couloux, B. Cousins, G. Genson, R. Harrison, P. Hanson, M. Hossaert-McKey, R. Jabbour-Zahab, E. Jousselin, C. Kerdelhue, F. Kjellberg, C. Lopez-Vaamonde, J. Peebles, Y-Q. Peng, R. Periera, T. Schramm, R. Ubaidillah, S. Van Noort, G. Weiblen, D-R. Yang, A. Yodpinyanee, R. Libeskind-Hadas, J. Cook, J-Y. Rasplus, V. Savolainen, "An Extreme Case of Plant-Insect Co-Diversification: Figs and Fig-Pollinating Wasps," *Systematic Biology*, December 2012, 61(6), pp. 1029-1047.
7. C. Alvarado, Z. Dodds, and R. Libeskind-Hadas, "Broadening Participation in Computing at Harvey Mudd College," *ACM Inroads*, Volume 3 Issue 4, December 2012, pp. 55-64.
8. Y. Ovadia, D. Fielder, C. Conow, and R. Libeskind-Hadas, "The Cophylogeny Reconstruction Problem is NP-Complete," *Journal of Computational Biology*, Vol. 18, No. 1, January 2011, pp. 59-65.
9. C. Conow, D. Fielder, Y. Ovadia, and R. Libeskind-Hadas, "Jane: A New Tool for the Cophylogeny Reconstruction Problem," *Algorithms for Molecular Biology*, Vol. 5, No. 16, February 2010.
10. R. Libeskind-Hadas and M. Charleston, "On the Computational Complexity of the Reticulate Cophylogeny Reconstruction Problem," *Journal of Computational Biology*, Vol. 16, No. 1, January 2009, pp. 105-117.

11. K. Benson, B. Birnbaum, E. Estolano-Molina, and R. Libeskind-Hadas, "Competitive Analysis of Online Traffic Grooming in WDM Rings," *IEEE/ACM Transactions on Networking*, Vol. 16, No. 4, August 2008, pp. 984-997.
12. I. Ferrel, E. Miller, A. Mettler, and R. Libeskind-Hadas, "Virtual Topologies for Multicasting with Multiple Originators in WDM Networks," *IEEE/ACM Transactions on Networking*, Vol. 14, No. 1, February 2006, pp. 183-190.
13. E. Miller, R. Libeskind-Hadas, D. Barnard, W. Chang, K. Dresner, W. Turner, and J. R. Hartline, "On the Complexity of Virtual Topology Design for Multicasting in WDM Trees with Tap-and-Continue and Multicast Capable Switches," *IEEE Journal on Selected Areas in Communications, Optical Communications and Networking Series*, Vol. 22, No. 9, November 2004, pp. 1601-1612.
14. J. R. Hartline, R. Libeskind-Hadas, K. Dresner, E. Drucker, and K. Ray, "Optimal Virtual Topologies for One-To-Many Communication in WDM Paths and Rings," *IEEE/ACM Transactions on Networking*, Vol. 12, No. 2, April 2004, pp. 375-383.
15. J. R. Hartline and R. Libeskind-Hadas, "The Computational Complexity of Motion Planning," *SIAM Review*, Vol. 45, No. 3, October 2003, pp. 543-557.
16. R. Libeskind-Hadas and R. Melhem, "Multicast Routing and Wavelength Assignment in Multi-Hop Optical Networks," *IEEE/ACM Transactions on Networking*, Vol. 10, Issue 5, October 2002, pp. 621-629.
17. R. Libeskind-Hadas, J. R. Hartline, P. Boothe, G. Rae, and J. Swisher, "On Multicast Algorithms for Heterogeneous Networks of Workstations," *Journal of Parallel and Distributed Computing*, (special issue on cluster and network-based computing), Vol. 61, No. 11, November 2001, pp. 1665-1679.
18. C. Jones and R. Libeskind-Hadas, "Matroids: The Theory and Practice of Greed," *The UMAP Journal*, Vol. 21, No. 2, Summer 2000, pp. 179-202.
19. B. Barden, J. Davis, R. Libeskind-Hadas, and W. Williams, "On Edge-Disjoint Spanning Trees in Hypercubes," *Information Processing Letters*, Vol. 70, Issue 1, April 16, 1999, pp. 13-16.
20. R. Libeskind-Hadas, "A Tight Lower Bound on the Number of Channels Required for Deadlock-Free Wormhole Routing," *IEEE Transactions on Computers*, Vol. 47, No. 10, October 1998, pp. 1158 -1160.
21. R. Libeskind-Hadas, "Sorting in Parallel," *The American Mathematical Monthly*, Vol. 105, No. 3, March 1998, pp. 238-245.
22. R. Libeskind-Hadas and E. Brandt, "Origin-Based Fault Tolerant Routing in the Mesh," *Future Generation Computer Systems*, Vol. 11, No. 6, October 1995, pp. 603-615.
23. R. Libeskind-Hadas, N. Shrivastava, R. G. Melhem, and C. L. Liu, "Optimal Reconfiguration Algorithms for Real-Time Fault Tolerant Processor Arrays," *IEEE Transactions on Parallel and Distributed Systems*, Vol. 6, No. 5, May 1995, pp. 498-510.
24. R. Libeskind-Hadas, "Approximation Algorithms: Good Solutions to Hard Problems," *The American Mathematical Monthly*, Vol. 102, No. 1, January 1995, pp. 57-61.

25. P. K. McKinley, N. Hasan, R. Libeskind-Hadas, and C. L. Liu, "Disjoint Covers in Replicated Heterogeneous Arrays," *SIAM Journal on Discrete Mathematics*, Vol. 4, No. 2, May 1991, pp. 281-292.

### Refereed Conference Papers

26. R. Libeskind-Hadas, "A Derivation-First Approach to Teaching Algorithms," *Proceedings of SIGCSE 2013*, March 2013, Denver, Colorado.
27. Z. Dodds, R. Libeskind-Hadas, E. Bush, "Bio1 as CS1: Evaluating a Crossdisciplinary CS Context," *Proceedings of ITiCSE 2012*, 17th Annual Conference on Innovation and Technology in Computer Science Education, Haifa, Israel, July 2012, ACM Press.
28. Z. Dodds, R. Libeskind-Hadas, E. Bush, "When CS1 is Biology1: Crossdisciplinary Collaboration as CS Context," *Proceedings of ITiCSE 2010*, 15th Annual Conference on Innovation and Technology in Computer Science Education, Bilikent, Turkey, June 2010, ACM Press.
29. K. Corcoran, S. Flaxman, M. Neyer, P. Scherpelz, and Ran Libeskind-Hadas, "Approximation Algorithms for Traffic Grooming in WDM Rings," *Proceedings of the IEEE International Conference on Communications*, June 2009, Dresden, Germany.
30. J. Crouser, B. Rice, A. Simpson, and Ran Libeskind-Hadas, "On-line Distributed Traffic Grooming," *Proceedings of the IEEE International Conference on Communications*, May 2008, Beijing, China.
31. Z. Dodds, R. Libeskind-Hadas, C. Alvarado, and G. Kuenning, "Evaluating Breadth-First CS 1 for Scientists," *Proceedings of SIGCSE 2008*, March 2008, Portland, Oregon.
32. Z. Dodds, C. Alvarado, G. Kuenning, and R. Libeskind-Hadas, "Breadth-first CS 1 for Scientists: Curriculum and Assessment," *Proceedings of the 12th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE)*, June 2007, Dundee Scotland.
33. D. Buchfuhrer, T. Carnes, B. Tagiku, L. Celis, and R. Libeskind-Hadas, "Traffic Grooming for Single-Source Multicast Communication in WDM Rings," *Proceedings of the IEEE International Conference on Communications*, May 2005, Seoul, South Korea.
34. R. Libeskind-Hadas, J. Hartline, K. Dresner, E. Drucker, and K. Ray, "Multicast Virtual Topologies in WDM Paths and Rings with Splitting Loss," *Proceedings of the Eleventh IEEE International Conference on Computer Communications and Networks*, October 2002, Miami, Florida, pp. 318-321.
35. R. Libeskind-Hadas and R. Melhem, "Multicast Routing and Wavelength Assignment in Multi-Hop Optical Networks," *Proceedings IEEE International Conference on Networking*, July 2001, Colmar, France. Available as Springer-Verlag Lecture Notes in Computer Science, Volume 2093, Pascal Lorenz (Editor), pp. 508-519.



36. R. Libeskind-Hadas and R. Melhem, "Multicast Communication in Circuit-Switched Optical Networks," *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2001)*, June 2001, Las Vegas, Nevada, pp. 1862-1868. (Invited Paper)
37. R. Libeskind-Hadas, "Efficient Collective Communication in WDM Networks with a Power Budget," *Proceedings IEEE Ninth International Conference on Computer Communications and Networks*, October 2000, Las Vegas, Nevada, pp. 612-616.
38. R. Libeskind-Hadas and J. Hartline, "Efficient Multicast in Heterogeneous Networks of Workstations," *Proceedings of the International Conference on Parallel Processing Workshop on Network-Based Computing*, August 2000, Toronto, Canada, pp. 403-410.
39. R. Libeskind-Hadas, D. Mazzoni, and R. Rajagopalan, "Optimal Contention-Free Unicast-Based Multicasting in Switch-Based Networks of Workstations," *Proceedings of the Merged 12th International Parallel Processing Symposium and the 9th Symposium on Parallel and Distributed Processing*, April 1998, Orlando, Florida, pp. 358-364.
40. R. Libeskind-Hadas, D. Mazzoni, and R. Rajagopalan, "Tree-Based Multicasting in Wormhole-Routed Irregular Topologies," *Proceedings of the Merged 12th International Parallel Processing Symposium and the 9th Symposium on Parallel and Distributed Processing*, April 1998, Orlando, Florida, pp. 244-249.
41. R. Libeskind-Hadas, T. Hehre, A. Hutchings, M. Reyes, and K. Watkins, "Adaptive Multicast Routing in Wormhole Networks," *Proceedings of the Ninth IASTED International Conference on Parallel and Distributed Computing and Systems*, October 1997, Washington D.C, pp. 513-522.
42. R. Libeskind-Hadas, K. Watkins, and T. Hehre, "Fault Tolerant Multicast Routing in the Mesh with No Virtual Channels," *Proceedings of the 1996 International Symposium on High-Performance Computer Architecture (HPCA '96)*, February 1996, San Jose, California, pp. 180-190.
43. R. Libeskind-Hadas, "A Tight Bound on the Number of Channel Faults in Wormhole-Routed Multicomputers," *Proceedings of the 1995 Pacific Rim International Symposium on Fault Tolerant Systems (PRFTS '95)*, December 1995, Newport Beach, California, pp. 14-18.
44. R. Libeskind-Hadas and E. Brandt, "Origin-Based Fault Tolerant Routing in the Mesh," *Proceedings of the 1995 International Symposium on High-Performance Computer Architecture (HPCA '95)*, January 1995, Raleigh-Durham, North Carolina, pp. 102-111.
45. R. Libeskind-Hadas, "Distributed Algorithms for the Reconfiguration of Fault Tolerant Multicomputers," *Proceedings of the Seventh International Conference on Parallel and Distributed Computing Systems (PDCS '94)*, October 1994, Las Vegas, Nevada, pp. 490-496.
46. R. Libeskind-Hadas and C. L. Liu, "Reconfigurable Multipipelines with Minimum Interprocessor Delay," *Proceedings of the Fifth International Conference on Parallel and*

- Distributed Computing and Systems (PDCS '92)*, October 1992, Pittsburgh, Pennsylvania, pp. 377-382.
47. R. Libeskind-Hadas, N. Shrivastava, R. G. Melhem, and C. L. Liu, "Efficient Bi-Level Reconfiguration Algorithms for Fault Tolerant Arrays," *Proceedings of the 1992 IEEE International Workshop on Defect and Fault Tolerance in VLSI Systems*, November 1992, Dallas, Texas.
  48. R. Libeskind-Hadas and C. L. Liu, "Fast Search Algorithms for Reconfiguration Problems," *Proceedings of the 1991 IEEE International Workshop on Defect and Fault Tolerance in VLSI Systems*, November 1991, Hidden Valley, Pennsylvania, pp. 260-273.
  49. R. Libeskind-Hadas and C. L. Liu, "Solutions to the Module Orientation and Rotation Problems by Neural Computation Networks," *Proceedings 26th Design Automation Conference (DAC)*, Las Vegas, NV, June 1989, pp. 400-405.
  50. R. Libeskind-Hadas and C. L. Liu, "Using Neural Networks to Solve VLSI Design Problems," *Proceedings 1989 American Control Conference*, Pittsburgh, PA, June 1989.
  51. R. Libeskind-Hadas and P. Maragos, "Application of Iterated Function Systems and Skeletonization to Synthesis of Fractal Images," *Proceedings SPIE Visual Communications and Image Processing II*, Cambridge, MA, October 1987, pp. 276-284.

### Technical Reports and Other Publications

52. S. Hambrusch, R. Libeskind-Hadas, Fen Zhao, D. Rabson, A. C. Dalal, E. Fox, C. Isbell, V. Taylor, "Exploring the Baccalaureate Origin of Domestic Ph.D. Students in Computing Fields," *Computing Research News*, Vol. 25, No. 1, January 2013.
53. R. Libeskind-Hadas and M. Charleston, "An Integer Linear Programming Formulation of the Cophylogeny Reconstruction Problem," University of Sydney School of Information Technology, Technical Report 629, ISBN 9781742100869.
54. "The Internet, the Web, and Logic" in the textbook *For All Practical Purposes, Sixth Edition* published by W. H. Freeman and Company, 2002.
55. R. Libeskind-Hadas, "Proof Without Words: The Pigeonhole Principle," *Mathematics Magazine*, Vol. 75, No. 1, November 2001, page 32.