# Curriculum Vitae of Uriel Feige

## Contact Information

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## Employment History

**1992 to the present:** The Weizmann Institute, Rehovot, Israel. Department of Computer Science and Applied Mathematics. Scientist until 1994, Senior Scientist until 1998, Associate Professor until 2003, Full Professor as of October 2003. Holds the Lawrence G. Horowitz Professorial Chair.
**2009 to the present:** Consultant, Microsoft Research, Herzeliya, Israel.
**Aug-Dec 2016:** Sabbatical, Princeton University, NJ.
**2004 to 2007:** Theory group, Microsoft Research, Redmond, WA.
**1998 to 1999:** Sabbatical, Compaq Systems Research Center, Palo Alto, CA.
**1980 to 1985:** Computer Engineer in the Israeli Defense Forces.

## Current research Interests

Algorithms and computational complexity in general, including approximation algorithms for NP combinatorial optimization problems, hardness of approximation, heuristics and average case analysis, randomized algorithms, algorithmic game theory.

## Education

**1991 to 1992:** IBM T.J. Watson Research Center, Yorktown Heights, New York, 10598. Postdoc.
**1990 to 1991:** Princeton University, Department of Computer Science, Princeton, New Jersey 08544. Postdoc.
**1987 to 1990:** Weizmann Institute of Science, Rehovot 76100, Israel. Ph.D. in Computer Science. Thesis title: *Alternative Models for Zero Knowledge Interactive Proofs*. (Ph.D. awarded on March 5, 1992.) Thesis advisor: Adi Shamir.
**1985 to 1987:** Weizmann Institute of Science, Rehovot. M.Sc. in Computer Science. Thesis title: *Interactive Proofs*. Thesis advisor: Adi Shamir.
**1977 to 1980:** Technion – Israel Institute of Technology, Haifa. B.Sc. in Computer Engineering.

## Professional Activity

Member of the Israeli delegation to the 14th General Assembly of the International Mathematical Union, August 17-18, 2002, Shanghai, China.

Member of the theses committee at the Weizmann Institute, 2001–2004.

Chair of Board of Studies, Faculty of Mathematics and Computer Science, 2002–2004.

Head of Department of Computer Science and Applied Mathematics, the Weizmann Institute, 2007–2014.

**Teaching Experience.** Taught several graduate level courses at the Weizmann Institute, including:
Algorithms and their Analysis,
Computational Complexity,
Probabilistic Methods in Computer Science,
Probabilistically Checkable Proofs and Approximation,
Algorithmic Game Theory.

**Journal editorial board:**
SIAM Journal on Discrete Mathematics (January 1998 – December 2003).
Random Structures and Algorithms (from January 2002).
SIAM Journal on Computing (September 2007 – January 2013).
Discrete Optimization (from January 2008).

*Membership in program committees.*
**FOCS'95.** 36th Annual Symposium on Foundations of Computer Science, 1995, Milwaukee, Wisconsin.
**ISTCS'96.** Fourth Israel Symposium on Theory of Computing and Systems, 1996, Jerusalem, Israel.
**FOCS'97.** 38th Annual Symposium on Foundations of Computer Science, 1997, Miami, Florida.
**COCOON'99.** Fifth Annual International Computing and Combinatorics Conference, 1999, Tokyo, Japan.
**CCC'01.** Computational Complexity Conference, 2001, Chicago, Illinois.
**APPROX'01.** Fourth International Workshop, APPROX, 2001, Berkeley, California.
**RANDOM'02.** Sixth International Workshop on Randomization and Approximation Techniques in Computer Science, 2002, Cambridge, Massachusetts.
**STOC'03.** 35th Annual ACM Symposium on Theory of Computing, 2003, San Diego, California.
**ICALP'03.** 30th International Colloquium, ICALP 2003, Eindhoven, Holland.
**RANDOM'04.** Eighth International Workshop on Randomization and Approximation Techniques in Computer Science, 2004, Cambridge, Massachusetts.

**APPROX'05.** Eighth International Workshop, APPROX, 2005, Berkeley, California.
**APPROX'06.** Ninth International Workshop, APPROX, 2006, Barcelona, Spain.
**ICALP'06.** 33rd International Colloquium, ICALP 2006, Venice, Italy.
**STOC'07.** 39th Annual ACM Symposium on Theory of Computing, 2007, San Diego, California. (**Program Chair.**)
**CCC'08.** 23rd Computational Complexity Conference, 2008, Maryland.
**APPROX'08.** Eleventh International Workshop, APPROX, 2008, Boston, Massachusetts.
**ESA'09.** 17th Annual European Symposium on Algorithms, 2009, Copenhagen, Denmark.
**FSTTCS'09.** IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, 2009, IIT Kanpur, India.
**COCOON'10.** The 16th Annual International Computing and Combinatorics Conference, 2010, Nha Trang, Vietnam.
**APPROX'10.** Thirteenth International Workshop, APPROX, 2010, Barcelona, Spain.
**SODA'12**. ACM-SIAM Symposium on Discrete Algorithms, 2012, Kyoto, Japan.
**AOFA'12**. The 23rd International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms, 2012, Montreal, Canada.
**ITCS'13**. The 4th Innovations in Theoretical Computer Science Conference, 2013, Berkeley, California.
**Approx'13**. The 16th. International Workshop on Approximation Algorithms for Combinatorial Optimization Problems, 2013, Berkeley, California.
**ITCS'15**. The 6th Innovations in Theoretical Computer Science Conference, 2015, Rehovot, Israel.
**FOCS'15.** 56th Annual Symposium on Foundations of Computer Science, 2015, Berkeley, California.
**COCOON'16.** The 22nd Annual International Computing and Combinatorics Conference, 2016, Ho Chi Minh City, Vietnam.
**STOC'18.** 50th Annual ACM Symposium on Theory of Computing, 2018, Los Angeles, California.

*Membership in organizing committees.*
Weizmann Workshop on Probabilistic Proofs and Applications to Program Checking, Cryptography and Hardness of Approximation. January 10–13, 1994. Weizmann Institute of Science.
Workshop on Discrete Metric Spaces and their Algorithmic Applications. March 3–7, 2002. Haifa, Israel.
Weizmann-Warwick Workshop on Algorithms. December 5–9, 2010. Weizmann Institute of Science.

Dagstuhl Seminar 11241, Design and Analysis of Randomized and Approximation Algorithms. June 13–17, 2011.
Simons Symposium on New Directions in Approximation Algorithms. January 27 – February 2, 2013. St. John, U.S. Virgin Islands.
Simons Symposium on New Directions in Approximation Algorithms. February 22 – 28, 2015. Peurto Rico.
Simons Symposium on New Directions in Approximation Algorithms. February 23 – 28, 2017. Schloss Elmau, Germany.

## Professional Recognition

*Awards and competitive scholarships/fellowships.*
**Best Paper Award SWAT 2008.**
**SIAM Outstanding Paper Prize, 2005.** The prizes are given for outstanding papers published in SIAM journals during the three years prior to the year of the award.
**Godel Award, 2001.** Sponsored jointly by the European Association for Theoretical Computer Science (EATCS) and the Special Interest Group on Algorithms and Computing Theory of the Association for Computing Machinery (ACM-SIGACT). The prize is awarded for outstanding papers in the area of theoretical computer science.
**Levinson Prize, 2000.** Awarded by the Weizmann Institute.
**Yigal Alon Fellowship, 1994–1997.** Awarded by the Council of Higher Education in Israel.
**Haim Weizmann Postdoctoral Fellowship, 1990.**
**Kennedy Prize, 1990.** Awarded by the Weizmann Institute.

*Research Grants.*
**Minerva.** Sharp thresholds for approximating NP optimization problems. 1998–2000.
**LSRT Consortium.** Large Scale Rural Telephony, Optimization Problems and Algorithmic Challenges. Jointly with David Peleg. A Magnet program funded by Israel Ministry of Industry and Trade. 2000–2003.
**ISF.** Thresholds for approximating NP-hard combinatorial optimization problems. 2002–2006.
**GIF.** Robustness aspects of algorithms. Jointly with Ingo Wegener from Dortmund. 2003–2005.
**ISF.** On Estimation Algorithms versus Approximation Algorithms. 2008–2012.
**Weizmann-UK.** The interplay between algorithms and randomness. Collaboration with University of Warwick. 2010–2012.
**Citigroup Foundation.** Scientific Challenges in Analyzing Global Financial Data. 2011–2013.
**ISF.** What makes a computational task NP-hard? 2012–2016.

**ISF.** New directions in average case analysis of NP-hard problems. 2016–2020. Jointly with Dan Vilenchik from BGU.

*Selected invited talks:*

**Random/Approx, Berkeley, California, 1999.** Randomized rounding of semidefinite programs – variations on the MAX CUT example.

**SWAT, Bergen, Norway, 2000.** Coping with NP-hardness of the graph bandwidth problem.

**STOC/ICALP, Hersonissos, Crete, 2001.** Reflections on the PCP theorem and its consequences (Godel Award talk).

**RSA, Poznan, Poland, 2001.** Semirandom structures and algorithms.

**ICM, Beijing, China, 2002.** Approximation Thresholds for Combinatorial Optimization Problems.

**Berliner Algorithmen Tag, Berlin, Germany, 2003.** Algorithms for Semirandom Instances of NP-hard Problems.

**SODA, Vancouver, Canada, 2005.** Rigorous analysis of heuristics for NP-hard problems.

**FSTTCS, Bangalore, India, 2008.** On Estimation Algorithms versus Approximation Algorithms.

**New Trends in Mechanism Design, CFEM, Copenhagen, Denmark, 2011.** Mechanism Design with Uncertain Inputs.

**Beyond Worst-Case Analysis, Stanford, California, 2011.** Universal Factor Graphs.

**Statistical mechanics of unsatisfiability and glasses, Mariehamn, Finland, 2012.** How to refute random nonsatisfiable formulas.

**Random/Approx, Barcelona, Spain, 2014.** Preprocessing of NP-hard problems.

**Phase transitions in randomized computational problems, AIM, San Jose, California, 2017.** Randomized NP-hard problems.

**Random/Approx, Berkeley, California, 2017.** Semi-random NP-hard problems.

## Supervision of Graduate Students

*PHD students in the Weizmann Institute.*

**Robert Krauthgamer.** Coping with NP-hardness: approximating minimum bisection and heuristics for maximum clique. 2001.

**Michael Langberg.** Coping with NP-hardness: Approximation Algorithms Based on Semidefinite Programming. 2003.

**Eran Ofek.** Rigorous analysis of heuristics for NP-hard problems. 2006.

**Daniel Reichman.** From independent sets to contagious sets: the layers model with applications. 2014.

**Shlomo Jozeph.** Universal factor graphs. 2014.

**Ran Izsak.** Coping with hardness of optimization problems by introducing

useful complexity measures. 2017.
**Roee David.** Algorithms for Finding Hidden Structures. 2017
**Shimon Kogan.**

*MSC students in the Weizmann Institute.*
**Giora Rayzmann.** Approximating Techniques for Job-Shop Scheduling Problems. 1996.
**Robert Krauthgamer.** Simple Algorithms for Hot-Potato Routing. 1996.
**Tatjana Rubshtein.** A dynamic hot potato algorithm for the torus. 1996.
**Kobbi Nissim.** On the Design and Use of Efficient Interactive Proofs. 1997.
**Michael Seltser.** On the densest $k$-subgraph problem. 1997.
**Michael Langberg.** Approximation Algorithms for Maximization Problems Arising in Graph Partitioning. 1998.
**Eran Ofek.** Maximum edge coloring with a bounded number of colors. 2001.
**Ehud Wieder.** Offline allocation of satellite resources, or edge coloring a multigraph with a fixed number of colors. 2001.
**Yuval Filmus.** Bandwidth Approximation of a Restricted Class of Trees. 2002.
**Eden Chlamtac.** Cover Times af Random Walks and Markov Chains. 2002.
**Idan Amit.** A finer classification of NP-complete problems. 2002.
**Eran Keydar.** Finding Hamiltonian cycles in semi-random graphs. 2002.
**Ilya Safro** (supervised jointly with Achi Brandt). The Minimum Linear Arrangement Problem. 2002.
**Shimon Kogan.** Approximating balanced bipartite clique. 2002.
**Danny Vilenchik.** Finding a satisfying assignment for semirandom satisfiable 3CNF formulas. 2004.
**Daniel Reichman.** Improved hardness results for 2-variable CSPs. 2004.
**Simon Korman.** On the use of randomization in the online set cover problem. 2005.
**Uri Barenholz** (supervised jointly with David Peleg). Achieving a better approximation for min-sum vertex cover. 2006.
**Chandan Dubey.** On Bandwidth approximation of graphs. 2008.
**Inbal Talgam.** A Direct Reduction from $k$-Player to 2-Player Nash Equilibrium. 2009.
**Shlomo Jozeph.** Oblivious Algorithms for the Maximum Directed Cut Problem. 2010.
**Alina Arbitman.** Planted random 3SAT with a small fraction of 1-clauses. 2012.
**Itay Gonshorovitz.** Reducing the maximum flow. 2012.
**Roee David.** Finding planted $k$-coloring in vector $k$-colorable graphs. 2012.
**Tal Wagner.** Generalized Girth Problems in Graphs and Hypergraphs. 2013.
**Uri Sherman.** A Different Perspective For Approximating Max Set Packing. 2013.
**Yuval Madar.** A capacitated cut and choose game. 2015.
**Yael Hitron.** The ordered covering problem. 2016.

**Anne Kenyon.** On the Profile of Multiplicities of Complete Subgraphs. 2017.