Cumulative Bio-Bibliography
University of California, Santa Cruz, CA
June 19, 2002
Robert Levinson
Associate Professor
Stevenson College Affiliate

EMPLOYMENT HISTORY

1993–	Associate Professor, Computer Science, University of California, Santa Cruz
1989–90	Visiting Professor, AI Group, FMC Corporation, Santa Clara, CA.
1985–93	Assistant Professor, Computer & Information Sciences, University of California, Santa Cruz
1983–85	Graduate Research Fellow, Department of Chemistry, University of Texas at Austin
1979–81	Contract Programmer, Computer Center, University of Minnesota, Minneapolis
1980–81	Teaching Assistant, University of Minnesota, Minneapolis
1977–79	Assistant Technical Support Analyst, Minnesota Gas Company, Minneapolis
1975–79	Director, Saturday Morning Program, Adath Jeshurun Synagogue, Minneapolis, MN

Consulting

2001 – present	Consultant. Genumerix. Artificial Intelligence and Chemistry.
2000–2000	Consultant. Manga Bay consortium. Financial Forecasting. New York, New York.
1999–2000	Consultant. StockScience.com. Financial Forecasting, Santa Cruz, CA.
1995–97	Consultant. TextWise - Research Division of Manning and Napier Information Services. Syracuse, NY.
1995–97	Consultant. Knowledge Engineering. IBM-Santa Teresa Laboratory
1985	Consultant, Engineering Consulting Resources Associates, Aptos, CA.

EDUCATION

Ph.D.	1985	University of Texas at Austin, Computer Science
B.S.	1981	University of Minnesota, Minneapolis, Computer Science (High Distinction)
B.S.	1981	University of Minnesota, Minneapolis, Mathematics (High Distinction)

MEMBERSHIPS IN HONORARY SOCIETIES

Tau Beta Pi
Phi Kappa Phi

HONORS AWARDS GRANTS

2002 UCSC School of Engineering Excellence in Teaching Award 2001-2002].

2001 Biography published in "2000 Outstanding Intellectuals of the 21st Century", International Biographical Centre, Cambridge, England.

2000-2002 Biography published in Who's Who in Science and Engineering:2000-2001, 5th Edition, Millenium Addition, 2000-2001, pp. 774,1530,1635. Also published in Who's Who in the World 2001, Who's Who in America, Who's Who in Engineering, 2001, Who's Who in Engineering 2002, and Who's Who in America, 2002, 56th Edition. Marquis Press. Who's Who in Science and Engineering 2002-2003.

2000-2001 Financial Forecasting. $20000 research grant from Manga Bay Consortium. New York, New York.

1997-1998 UCSC School of Engineering Excellence in Teaching Award.

1996–1997 Intelligent Information Retrieval. $68000 grant for Robert Levinson and Gil Fuchs from Textwise, Inc.

1995–96 Chronological Information Extraction Systems, ($749,977) $60,000 for UCSC: joint SBIR proposal with TextWise, Inc, Syracuse, New York.

1994–95 UCSC Seed Grant: *Adaptive Conceptual Graphs Database for Medical Descriptions,* $11,000.

1993–97 ONR - *Real-time Environmental Information Network and Analysis System,* (REINAS) $4,767,395 P. Mantey, D. Long, A. Pang, R. Levinson, G. Langdon.

1992–93 NSF Supplemental Funding for Undergraduates $4,000.

1991–93 NSF Research Grant: *"Adaptive Pattern-Oriented Chess",* $298,391.

1991 Faculty Research Committee Grant $1,500.

1989– NSF Research Grant: *"Pattern Formation, Associative Recall and Search",* $35,000.

1989 UCSC Seed Grant: *"Pattern Formation, Associative Recall and Search",* $15,000.

1988 Best Paper Award: *"A Self-Organizing Pattern Retrieval System and its Applications",* given at Third Annual Rocky Mountain Conference on AI - Denver

1987–88 UCSC Junior Faculty Fellowship - Artificial Intelligence and Chemistry.

1986–87 UCSC Junior Faculty Fellowship - Self-Organizing Databases.

1986–87 NASA Research Grant: *"Intelligent Signal Analysis and Recognition,"* in conjunction with NASA-Ames SETI Project, $40,000.

1983–85 Research Fellowship, Welch Foundation in Chemistry, University of Texas at Austin.

1981–84 University of Texas Graduate Fellowship.

1981–83 National Science Foundation Graduate Fellowship.

1979–84 Lando Fellowship, University of Minnesota, CSCI Department.

PUBLICATIONS

use of "and" means equal work, otherwise order favors the first author.

Refereed Journals

1. Levinson, R. A. and G. Fuchs. 2001. "A Pattern-Weight Formulation of Search Knowledge", in *Computational Intelligence.*, Volume 17, Number 4, pp. 783–811.
2. Jeff Wilkinson and Robert Levinson, Research Environment for Data Analysis Tool Allocators", in Special Issue of the *Journal of Applied Intelligence* on Intelligent Data Analysis, Vol. 11, pp. 241-258, Kluwer Academic Publishers.
3. Khan, E. and R.A. Levinson. 1998. "Robust Speech Recognition Using a Noise Rejection Approach", will appear in *International Journal on Artificial Intelligence Tools*, World Scientific Press. Extended version of symposium paper listed below.
4. Khan, E. and R.A. Levinson 1998. "Robust Speech Recognition Using Noise Rejection and Higher Level Decision Making", submitted to *IEEE Signal Processing and Audio Journal.*
5. Hammond, Che and R.A. Levinson, 1997. "Decision Trees, Compression, and Boolean Lattices", Extended abstract in *Logic Journal of the IGPL,* (ISSN1367-0751), Oxford University Press. Reprint of workshop paper below.
6. Levinson, R.A. "General Game-Playing and Reinforcement Learning", special issue of *Computational Intelligence on Games: Structure and Learning,* Vol. 12, No. 1, pp. 155–176, February 1996.
7. Ellis, G., R.A. Levinson, and P.J. Robinson, "Managing Complex Objects in PEIRCE", in special issue on Object-Oriented Approaches In Artificial Intelligence and Human-Computer Interaction, *International Journal of Man-Machine Studies,* (IJMMS). Vol. 41, pp. 109–148, 1994.
8. Levinson, R.A. and R. Snyder, "Distance: Towards the Unification of Chess Knowledge", in *International Computer Chess Association Journal,* Vol. 16, No. 3, pp. 123–136, September, 1993.
9. Levinson, R.A. and G. Ellis, "Multi-Level Hierarchical Retrieval", in special issue of *Knowledge-Based Systems Journal on Conceptual Graphs,* Vol. 5, No. 3, September 1992.
10. Levinson, R. A., B. Beach, R. Snyder, T. Dayan and K. Sohn, "Adaptive-Predictive Game-Playing Programs", in *Journal of Experimental and Theoretical Artificial Intelligence,* Vol. 4, pp. 315–337, 1992.
11. Levinson, R. A. 1992. "Pattern Associativity and the Retrieval of Semantic Networks", in *Journal of Computers & Mathematics with Applications.* Part 2 of special issue on Semantic Networks in Artificial Intelligence, Vol. 23, pp. 573-600, Fritz Lehman, Guest Editor, Pergamon Press.
12. Levinson, R. A. 1991. "A Self-Organizing Pattern Retrieval System", in *International Journal of Intelligent Systems,* Vol. 6, pp. 717–738, John Wiley and Sons. Also appears as Technical Report UCSC-89-21, University of California, Computer Research Laboratory, Santa Cruz, CA 95064.
13. Levinson, R. A. with F. Hsu, T. Marsland, J. Schaeffer, and D. Wilkins, "The Role of Chess in Artificial Intelligence Research", in *Int'l Computer Chess Association Journal,* Vol. 14, No. 3, pp. 153–162, 1991.
14. Levinson, R. A. 1989. "A Self-Learning Pattern-Oriented Chess Program", in *International Computer Chess Association Journal,* December 1989, Vol. 12 No. 4, pp. 207-215, Edmonton, Canada.

Books

1. " Scientific Thinking: A Systems Approach", Andrew Goodwin and Robert Levinson. Addison-Wesley. In progress. 2000. (draft out for peer review)

Book Chapters - peer reviewed

1. Chess Neighborhoods, Function Combination and Machine Learning, pp. 133-150 in Computers and Games, Tony Marsland and Ian Frank editors. Lecture Notes In Computer Science. Springer-Verlag, Berlin Heidelberg 2001. Revised Version of Conference Paper below.

2. Robert Levinson, "Symmetry and the Computation of Conceptual Structures", pp. 492-505 in Conceptual Structures, Logic, Language and Computation, Bernhard Gantner and Guy Mineau, editors. Springer, Berlin Heidelberg, 2000. Also appears as conference paper below.

3. Robert Levinson and Jeff Wilkinson, "Meta-Reasoning for Data Analysis Tool Allocation", in *Advances in Intelligent Data Analysis,* pp. 89–100 X.Lie, P.Cohen and M. Berthold (Eds.), Lecture Notes in Computer Science, Springer-Verlag, Berlin, Heidelberg, 1997. Also listed as conference paper below.

4. Gil Fuchs and Robert Levinson, "The CG Mars Lander," in Conceptual Structures: Fulfilling Peirce's Dream, *Lecture Notes in Artificial Intelligence,* Dickson Lukose, Harry S. Delugach, Mary Keeler, Leroy Searle, and John F. Sowa, eds., Springer-Verlag, Vol. 1257, pp. 611–616, 1997. Also listed as conference paper below.

5. Allen, J., E. Hamilton, and R.A. Levinson, "New Advances in Adaptive Pattern-Oriented Chess", in *Advances in Computer Chess,* Vol. 8 pp. 213–233. Edited by H.J. Herik and J. W. Uiterwijk. Maastricht, The Netherlands, 1997. Reprint of symposium paper below.

6. Esch, J. and R.A. Levinson, "Propagating Truth and Detecting Contradiction in Conceptual Graph Databases," in Conceptual Structures: Knowledge Representation as Interlingua, P.W. Eklund, G.E. Ellis and G. Mann, editors, *Lecture Notes in Artificial Intelligence,* Springer-Verlag, Berlin, No. 1115, pp. 229–247, 1996. Also listed as conference paper below.

7. Esch, J. and R.A. Levinson, "An Implementation Model for Contexts and Negation in Conceptual Graphs", in Conceptual Structures: Applications, Implementation and Theory, *Lecture Notes in Artificial Intelligence,* Springer-Verlag, Berlin, pp. 247–262, 1995. Also listed as conference paper below.

8. Levinson, R.A, "UDS: A Universal Data Structure", in Conceptual Structures: Theory and Practice, *Lecture Notes in AI 835,* eds., W.M. Tepfenhart, J.P. Dick, and J.F. Sowa, Springer-Verlag, Berlin, pp. 230–250, 1994. Also listed as conference paper below.

9. Levinson, R. A. "Towards Domain-Independent Machine Intelligence," in the book Conceptual Graphs for Knowledge Representation, *Lecture Notes in Computer Science,* G. Mineau, B. Moulin, J. F. Sowa, editors, Springer Verlag, New York, Vol. 699, pp. 254–273, 1993. Also listed as conference paper below.

10. Levinson, R. A., "Experience-Based Creativity", in the book *Artificial Intelligence and Creativity: An Interdisciplinary Approach,* pp. 161–179, Terry Dartnall, editor. Kluwer Academic Press.

11. Gould, J. and R.A. Levinson, "Experience-based Adaptive Search," in *Machine Learning 4: a Multistrategy Approach,* Ryzard Michalski and George Tecuci, editors, Morgan Kaufman Publishers, pp. 579–604, 1994.

12. Ellis, G. and R.A. Levinson. "The Birth of PEIRCE", in the book Conceptual Structures: Theory and Implementation, *Lecture Notes in Artificial Intelligence 754,* Heather D. Pfeiffer, Tim E. Nagle, editors. Springer-Verlag publishers, New York, 1993. Also listed as conference paper below.

13. Levinson, R. A. 1992. "Pattern Associativity and the Retrieval of Semantic Networks", in the book "Semantic Networks in Artificial Intelligence," Fritz Lehmann, editor, pp. 573–600, Pergamon Press.

14. Levinson, R. A. with C. Wilcox. "A Self-Organized Knowledge Base for Recall, Design and Discovery in Organic Chemistry", in the book *Artificial Intelligence Applications in Chemistry,* Thomas H. Pierce, Bruce A. Hahne, editors. Washington, D.C., American Chemical Society.

Major Conferences - peer reviewed

1. Shapiro, A., Fuchs, G, and Levinson, R. Learning a Game Using Pattern-Weghts and Self-Play. accepted to Third International Conference on Computers and Games, Edmonton, July, 2002.
2. Levinson, R.A and Weber,R. Chess Piece Neighborhoods, Function Combination, and Reinforcement Learning, in Proc. Second International Conference on Computers and Games, Japan, October 2000. Also appears as book chapter above.
3. Levinson, R.A. "Symmetry and the Computation of Conceptual Structures", In Proc. International Conference on Conceptual Structures, Darmstadt Germany, August 2000. Also appears as book chapter above.
4. Levinson, R.A and Weber, R.J. Pattern-Level Temporal Difference-Learning, Data Fusion and Chess. Pp. 43–52 in Proc. SPIE AEROSENSE: Sensor Fusion: Architecture, Algorithms, and Applications IV. Orlando, Florida, April 2000.
5. Khan, E. and R.A. Levinson, "Boosting a Noise Rejection Approach for Speech Recognition using Higher Level Decision-Making", pp. 810-817 in *In Proc. International Conference on Multisource-Multisensor Data Fusion.*
6. Fuchs, G. and R.A. Levinson, "The CG MARS LANDER," in *Proceedings of the 5th International Conference on Conceptual Structures,* Seattle, Washington, pp. 611-616, 1997. Dickson Lukose, Harry Delugach, Mary Keeler, Leroy Searle, and John F. Sowa editors. Also listed as book chapter above.
7. Esch, J. and R.A. Levinson, "Propogating Truth and Detecting Contradiction in Conceptual Graphs Databases", in *Proceedings of the 4th International Conference on Conceptual Structures,* pp. 229–247, Sydney, Australia 1996. Also listed as book chapter above.
8. Esch, J. and R.A. Levinson, "An Implementation Model for Contexts and Negation in Conceptual Graphs", in *Third International Conference on Conceptual Structures,* pp. 247–262, Santa Cruz, CA, USA 1995. Also listed as book chapter above.
9. Levinson, R.A. "UDS: A Universal Data Structure", in *Proceedings of Second International Conference on Conceptual Structures,* College Park, Maryland USA, pp. 230–250. Also listed as book chapter above.
10. Roberts, D., R.A. Levinson, and R. Hughey, "Issues in Parallel Hardware for Graph Retrieval", in *Proceedings of 1st International Conference on Conceptual Graphs,* pp. 62–81, G. Mineau, B. Moulin and J.F. Sowa, editors. Quebec. 1993.
11. Levinson, R.A. "Towards Domain-Independent Machine Intelligence", presented at *1st International Conference on Conceptual Graphs,* Quebec, 1993. Also listed as book chapter above.
12. Levinson, R. A. with F. Hsu, T. Marsland, J. Schaeffer, and D. Wilkins. "Panel: The Role of Chess in Artificial Intelligence Research", in *Proceedings of IJCAI-91,* pp. 547-552, Morgan Kaufman Publishers.
13. Levinson, R. A. and R. Snyder. "Adaptive, Pattern-Oriented Chess", in *Proc. AAAI-91,* pp. 601–605 and *Proceedings of Machine Learning Workshop,* pp. 85–89, 1991, Morgan Kaufman Publishers.
14. Levinson, R. A. 1988. "Intelligent Signal Analysis and Recognition Using a Self-Organizing Database", in *Proceedings of The First International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems,* ACM.
15. Levinson, R. A. 1988. "A Self-Organizing Pattern Retrieval System and its Applications", **Best Paper Award** in *Proceedings of RMCAI-88,* Denver.
16. Levinson, R. A. August 1984. "A Self-Organizing Retrieval System for Graphs", in *Proc. AAAI-84,* Vol. 23 Numbers 3 and 4, pp. 34–59.

Symposium Papers - peer reviewed

1. Khan, E. and R. Levinson, "Robust Speech Recognition Using a Noise Rejection Approach", pp. 326–335 in *Proc. of IEEE International Joint Symposia on Intelligence and Systems,* ISNL98, IEEE Computer Society Press, Rockville, Maryland, 1998. Extended version accepted for journal publication - see above.

2. Wilkinson,J. and R. Levinson, "Meta-Reasoning, Decision Trees, and Multi-Agent Learning", in *Proceedings of International Symposium on Intelligent Systems, EIS'98,* Vol. 3, pp. 462–468, 1998. University of La Laguna, Tenerife, Spain.

3. Levinson, R.A. and J. Wilkinson, "Meta-Reasoning for Data Analysis Tool Allocation", in *Proceedings of The Second International Symposium on Intelligent Data Analysis (IDA-97),* pp. 89–100. Birkbeck College, University of London, August 4-6, 1997. Also listed as book chapter above.

4. Allen, J. and Hamilton, E. and Levinson, R.A., "New Advances in Adaptive Pattern-Oriented Chess", *8th Annual Conference on Advances in Computer Chess,* June 27-28, 1996, Maastricht, Netherlands. Also listed as book chapter above.

5. Levinson, R.A. "Exploiting the Physics of State-Space Search", in *Proceedings of AAAI Fall Symposium on Games: Planning and Learning,* Susan Epstein and R.A. Levinson, editor, AAAI Press, pp. 157–165, Menlo Park, 1993.

6. Dartnall, T., S. Kim, R. Levinson, and D. Subramanian (editors), *Proceedings of AAAI Spring Symposium on Artificial Intelligence and Creativity,* Menlo Park, 1993.

7. Wescott, C. and R. A. Levinson. "Experience-Based Music Composition", in *Proceedings AAAI Spring Symposium on AI and Creativity,* pp. 50–56, Palo Alto, 1993.

8. Levinson, R. A., "Experienced-Based Creativity", in *Proceedings of the Symposium on AI, Reasoning and Creativity,* Sydney, Australia, August, 1991, Abstract pp. 29–31. Also, full article in the book *AI and Creativity,* Kluwer Academic Press (as above).

Proceedings and Editorships - contents peer reviewed

1. 01 Levinson, R.A¿ General Chair of Proceedings 9th Int' Conference on Conceptual Structures, ICCS2001, Stanford, CA. USA. 2001.

2. Second International Conference on Information Fusion. Volumes 1 and 2. OmniPress, 1999.

3. Pell, B, S. Epstein, and R.A. Levinson, Introduction to the Special Issue on Games: Structure and Learning, *Computational Intelligence,* Vol. 12, No. 1, pp. 1–6, 1996.

4. Epstein, S., R.A. Levinson, and B. Pell, Guest Editors, Special Issue of Computational Intelligence on Games: Structure and Learning, Vol. 12, No. 1, 1996.

5. Ellis, G. and R.A. Levinson, W. Rich, and J.F. Sowa, (editors), Conceptual Structures: Applications, Implementation and Theory *Lecture Notes in Artificial Intelligence,* No. 954, Springer-Verlag, Berlin, 1995.

6. Ellis, G., R.A. Levinson, W. Rich, and J.F. Sowa, (editors), *Proceedings of the Third International Conference on Conceptual Structures, ICCS '95,* August 14–18, 1995. University of California, Santa Cruz, USA, Supplementary Proceedings.

7. Ellis, G., R.A. Levinson, A. Fall, and V. Dahl, (editors). *Proceedings of International KRUSE Symposium: Knowledge Retrieval, Use and Storage for Efficiency,* August 11-13, 1995, Department of Computer Science, University of California at Santa Cruz, Santa Cruz, CA.

8. Halford, G.S. and R.A. Levinson, "Creativity and Cognition", section introduction in the book *Artificial Intelligence and Creativity: An Interdisciplinary Approach,* Kluwer Academic Press, Terry Dartnall, editor, pp. 139–144, 1994.

9. S. Epstein and R.A. Levinson (editors) *Proceedings of the AAAI Fall Symposium on Games: Planning and Learning,* AAAI Press. Menlo Park, 1993.

10. Levinson, R.A. and G. Ellis, (editors). *Proceedings of the Second Annual PEIRCE Workshop,* at the First International Conference on Conceptual Structures, Quebec, 1993.

11. Ellis, G. and R. A. Levinson (editors). *Proceedings of the First International Workshop on PEIRCE: A Conceptual Graphs Workbench,* available as Technical Report No. 241, Key Centre for Software Technology, Department of Computer Science, The University of Queensland, Queensland Australia, September, 1992.

Workshop Papers - peer reviewed

1. Hammond, C. and R.A. Levinson, "Decision Trees, Compression, and Boolean Lattices, in *Proceedings of the 4th Workshop on Logic, Language, Information and Computation, WoLLIC'97,* Fortaleza (Ceara), Brazil, pp. 42–47, August 20-22, 1997. 24 of 48 accepted. Also listed as journal abstract above.

2. Levinson, R and J. Wilkinson, "Deep Blue is Still an Infant", in *Proceedings of the AAAI-97 Workshop on The Significance of Deep Blue vs. Kasparov,* pp. 3–8. Technical Report WS-97-04, AAAI Press, Providence, R.I., 1997.

3. Levinson, R.A. "LEARN: Exploiting the Physics of State-Space Search with MorphII," in *Proceedings of Third PEIRCE Workshop: A Conceptual Graph Workbench,* pp. 29–44, Gerard Ellis, ed., August 19, 1994, University of Maryland, College Park, MD, USA.

4. Amenta, John and R.A. Levinson. "Morph Interactive User Guide", in *Proceedings of Third PEIRCE Workshop: A Conceptual Graph Workbench,* pp. 67–75, Gerard Ellis, ed., August 19, 1994, University of Maryland, College Park, MD, USA.

5. Levinson, R. and K. Karplus, "Graph-Isomorphism and Experience-Based Planning", in *Proceedings of Workshop on Knowledge Compilation and Speedup Learning,* Massachusetts, 1993.

6. Snyder, R. and R. A. Levinson. "Distance: Towards the Unification of Chess Knowledge", presented at the Workshop on The Impact of Computer Chess on Artificial Intelligence Research, 7th Triennial World Computer Chess Championship, Universidad de Madrid, Madrid, Spain, November 1992. Also published in the International Computer Chess Association Journal for March 1993.

7. Ellis, G. and R.A. Levinson, "The Birth of PEIRCE", in *Proceedings of 7th Annual Workshop on Conceptual Graphs,* New Mexico State University, Heather Pfeiffer, editor, July 8-10, 1992. Also, in the book "Conceptual Structures: Theory and Implementation", Springer-Verlag publishers, 1992 - as above.

8. Levinson, R.A. "APS: An Architecture for Experience-Based Knowledge Acquisition", in *Proceedings of Workshop on Computational Architectures for Supporting Machine Learning and Knowledge Acquisition,* at the Machine Learning Conference, Aberdeen, Scotland, July 4, 1992.

9. Gould, J. and R.A. Levinson, "Experience-based Adaptive Search," in *Proceedings of Workshop on Machine Learning at Ninth Biennial Conference of the Canadian Society of Computational Studies (CSCSI),* pp. 27–37, Vancouver, Canada, May 12, 1992.

10. Gould, J. and R.A. Levinson. "Method Integration for Experience-Based Learning", in *Proceedings International Workshop on Multi-Strategy Learning,* pp. 378–393, November 7-9, 1991, Harpers Ferry, West Virginia, R. Michalski, program chair. George Mason University Press.

11. Levinson, R. A. and G. Ellis. "Multi-Level Hierarchical Retrieval", in *Proceedings of 6th Annual Workshop on Conceptual Graphs,* pp. 67–81, Suny-Binghamton, July 1991.

12. Levinson, R. A. 1989. "A Self-Learning Pattern-Oriented Chess Program", in *Proceedings of Workshop on New Directions in Game-Tree Search,* World Computer Chess Championship, edited by T.A. Marsland, International Computer Chess Association, Edmonton, Canada, 1989.

Reports, Reviews, and Other Publications - not peer reviewed

1. Epstein, S. and R.A. Levinson. A Report on the Fall Symposium on Games: Planning and Learning, Artificial Intelligence Magazine, Vol. 15, No. 1, pp. 14–15, 1993.

2. Levinson, R.A. 1994. "MorphII: A Universal Agent: Progress Report and Proposal", UCSC Technical Report UCSC-CRL-94-22.

3. Levinson, R.A. 1993. A review of the book "Computers, Chess and Cognition", in *Mathematical Intelligencer,* Vol. 15, No. 2, pp. 67–71, 1993.

4. Levinson, R.A. and J. Amenta, "MORPH, An Experience-Based Adaptive Chess System: A demonstration report", in *International Computer Chess Association Journal,* Vol. 16, No. 1, pp. 51–53, March 1993.

5. Long, Darrell D.E.; Patrick Mantey, Alex Pang, Glen Langdon, Jr., Robert Levinson, Harwood Kolsky, and Bruce Gritton, REINAS: Real-time Environmental Information Network and Analysis System: Concept Statement: UCSC-CRL-93-05, January 1993.

6. Levinson, R.A. "Man and Machine, Theory and Practice, Square Off", in Sydney. Report in Int'l Computer Chess Association Journal, Vol. 14, No. 3, pp. 150-152, 1991.

7. Levinson, R.A. "A Report on the 21st ACM North American Computer Chess Championship", pp. 208–210 in *International Computer Chess Association Journal,* December 1990.

8. Levinson, R.A. 1989. "Pattern Formation, Associative Recall, and Search: A Proposal", Technical Report UCSC-CRL-89-22, University of California, Computer Research Laboratory, Santa Cruz, CA.

9. Levinson, R.A. and C. Colin. 1988. "Partial Order Maintenance", in Special Interest Group on Information Retrieval (SIGIR) Forum, California, Computer Research Laboratory, Santa Cruz, CA.

10. Levinson, R.A. "A Self-Organizing, Graph-Based, Database Retrieval System," Ph.D. dissertation, May 1985. Technical Report AI-85-05, Department of Computer Science, University of Texas at Austin.

11. Levinson, R.A. with E. Rich and C. Wilcox, "Self-Organizing Databases for Intelligent Retrieval", Sigart *Newsletter No. 86,* October 1983, ACM.

PROFESSIONAL ACTIVITIES

Tutorials

1997 Lecture on Artificial Intelligence: Current and Future Impact, to SIRS Retirement Club, Watsonville, California. March 13.

1995 3 two-hour lectures on Artificial Intelligence, Hierarchical Graph Retrieval, and Automated Inference, Sept. 16-17 at TextWise, Center of Science and Technology, Syracuse University, Syracuse New York.

1995 5 two-hour Lecture Series given at IBM Santa Theresa (July 17,19,26,28 ; August 3, 1995.): Hierarchical Graph Retrieval, Advanced Graph Retrieval; Overview of Machine Learning Research, MorphII, Inference Using Existential Graphs.

1993 "Conceptual Graph Implementation for Industrial Strength AI". 3 hours at the First International Conference on Conceptual Structures, Laval University, Quebec Canada, August 5, 1993.

Invited Lectures at Conferences

2000 "Graph-based Information Retrieval" at the 8th International Conference on Conceptual Structures,Darmstadt, Germany, 2000.

1995 "Graph-Based Logic Programming" at Workshop on Visions for the Future of Logic Programming, International Logic Programming Symposium, Portland, Oregon, 1995.

1993 "Retrieval, Learning and Schema Translation in PEIRCE". IBM's Second Annual Symposium on Computer-Integrated Manufacturing. Thornwood, New York, February 18-19, 1993.

Lectures

2002 Real-Time Question Answering Using Conceptual Graphs, at McGraw-Hill, Monterrey California, Richard Schwarz, chair. Feb. 4, 2002.

2001 Graphs: Large Scale Storage and Rapid Retrieval, Stanford University CS545 Database Seminar, Gio Weiderhold, Chair, November 30, 2001.

1999 The CG Mars Lander, with Gil Fuchs at Stanford University School of Medical Informatics, Mark Musen and Harold Boley, chairs.

1995 2 hour lecture on Inference using Existential Graphs given at Third International Conference on Conceptual Structures, Santa Cruz, August 16, 1995.

1995 Panelist. Peirce Workshop, Santa Cruz, August 18, 1995.

1994 November 11th. CIS/Biology Joint Seminar: Whale Recognition by Flukes with Dr. Paul Forestell, Pacific Whale Foundation, Hawaii.

1994 April 1st, 2 hour Lecture on Relational Databases to UCSC Campus Data Processing Staff, Jeanne Whitney, Coordinator.

1993 Demonstration of Morph Adaptive Chess System at ACM's Computer Chess Championship, M. Newborn Director, Indianapolis, February 16-18, 1993.

1993 Panelist on Panel on COMPUTER CHESS: What Remains?, T. Marsland, Chair, ACM Supercomputing Conference, Indianapolis, February 16, 1993.

1992 "PEIRCE: A Conceptual Graphs Workbench", "Multi-Level Hierarchical Retrieval," "Experience-Based Learning." Each talk given in one day workshop at Section on Medical Informatics, Medical School, Stanford University, Keith Campbell, Chair. October 28, 1992.

1992 "Experience-Based Creativity," Department of Computer Science, Cambridge University, UK, June 29, 1992.

1992 "Experience-Based Creativity," Department of Computer Science , University of Edinburgh, Scotland, June 26, 1992.

1992 Session Leader on PEIRCE at 7th Annual Workshop on Conceptual Graphs, New Mexico State University, July 9, 1992.

1991 Panelist on "Future Directions in Computer Chess," T. Marsland, Chair at 22nd ACM International Computer Chess Championship, Albuquerque, NM, November 20.

1991 Featured Demonstration of Adaptive Pattern-Oriented Chess System at 22nd ACM International Computer Chess Championship, Albuquerque, NM, November 17-20.

1991 Panel Chair and Panelist at IJCAI-91, August 28, Sydney, Australia. "The Role of Chess in Artificial Intelligence Research" with F. Hsu, J. Schaeffer, T. Marsland, D. Wilkins.

1989 “Pattern Formation, Associative Recall, and Search,” given at: FMC Corporation, June 30, and UCSC Graduate Seminar, October 31.

1988 “Finding Vertex Covers of Cubic Graphs,” given at: Third Symposium on Complexity of Approximately-Solved Problems, Columbia University, April 4th. UCSC CIS/CE Machine Learning Seminar - October 19.

1989 “Self-Organizing Pattern Retrieval and Intelligent Signal Recognition” given at: FMC Corporation, June 23.

1988 “Self-Organizing Pattern Retrieval and Intelligent Signal Recognition” given at: Naval Post Graduate School, Monterey, CA - December 9th. Santa Clara University Research Seminar - May 26th. UCSC CIS/CE Research Colloquium - February 26th.

Articles/Interviews/Seminars/Photos/Prizes

2000 Selected as a “top expert” based on quality of answers at www.askme.com. June 1, Sept. 1, 2000.

1999 February 25, Interviewed in City on a Hill Press at UC-Santa Cruz on “Two Years After Legislation Ended Affirmative Action in California’s Colleges, UC Santa Cruz is left to Ask... What Now?”.

1997 Sept. 1, Quoted in Seeding Intelligence by Kristi Coale in Wired News, http://www.wired.com/news/news/technology/story/5433.html

May 14, Quoted twice in “Deep Blue Win Opens Old Wound”, The Columbus Dispatch, Columbus, Ohio, David Lore.

May 13, Morph discussed in Inside Mac Games http://www.imgmagazine.com/issues/vol5_issue4/p7.html Square One: Deep Blue Something. by Andy Veres.

May 12, UNISCI: Research News from American Universities, http://unisci.com/ Don Radler, Editor. Deep Blue’s Victory Called “Not Quite Mind-Blowing”.

May 12, Wired news services, http://www.wired.com/news/ Deep Blue still has some learning to do. Kristi Coale. Discusses our projects: Morph and MRDATA.

May 5, UNISCI: Research News from American Universities, http://unisci.com/ Don Radler, Editor. Reprint of May 1 news release. UCSC Professor Sees Deep Blue as “Still an Infant”.

May 1, News release in Science Daily, http://www.sciencedaily.com/topic_order_chaos.html

May 1, UCSC News Release, “Deep Blue” Inspires Deep Thinking About Artificial Intelligence by UC Santa Cruz Computer Scientist.

June 10, MorphIII searching 1-ply plays first game in Internet Chess Club - drawing computer WimpE (rating 981).

April 26, UCSC Currents Vol. 6 No. 14, Science News article cited.

March 30, Quoted and Morph referenced in SCIENCE NEWS, “The Soul of a Chess Machine”, Ivars Peterson, Vol. 149, pp. 200–201.

1995 January 1, Morph Web Page started by Jay Scott of Swarthmore college. http://satirist.org/learn-game/projects/morph.html

1994 October 20, Talk on Levinson’s research at IBM-Boca-Raton Florida, “A New Approach to Database Operations, Inference and Machine Learning” by Alex Bejan.

March, Symposium on Games: Planning and Learning written up in *ICCA Journal,* Vol. 17, No. 1, pp. 40–41.

July, ACM Membernet, Vol. 36, No. 7, July 1993, Morph and quotation in report on ACM Computer Chess Tournament.

March, *International Computer Chess Association Journal,* Vol. 16, No. 1, cited in "Computer Chess What Remains?", a panel discussion report, pp. 47–50, and Note: Computer Chess, Its Impact on Artificial Intelligence, pp. 31–36, H. Horacek.

1992 December, *Int'l Computer Chess Assn. Journal,* Chess and AI Workshop report, Vol. 15, pp. 229.

December, "Humanizing Computer Chess" in *Journal of College Science Teaching,* Vol. 12, No. 3, Dec. 1992/Jan. 1993. page 145.

October, Levinson/Ellis algorithms verified to be the best in "An Empirical Analysis of Optimization Techniques for Terminological Representation Systems or: Making KRIS get a move on". F. Baader, B. Hollunder, B. Nebel, and H. J. Profitlich in Principles of Knowledge Representation and Reasoning – *Proceedings of the 3rd International Conference,* October 1992, Cambridge, MA.

September, Article on Morph in UCSC Student Guide for Fall quarter pp. 55–56.

June, *Communications of the ACM,* Vol. 35, No. 6, pg. 10, Newstrack, "Learn from Experience...".

May, 1 of 10 professors cited by Dean of Graduate Studies for productive year in Selected Publications of UCSC Faculty 1991.

April 9, City on a Hill - Vol. 26, No. 22 - UCSC Campus Newspaper. Feature Story. The Electronic Prodigy Named Morph: A UCSC Professor Has Made a Computer That Learns Chess, 1.5 pages and photo.

March 20, President's A–Report to the Regents of University of California, "Santa Cruz Computer Scientist Develops Thinkers Chess Program".

March 16, KUSP-FM, Santa Cruz, radio interview with Steve Baron.

March 11, *The Chronicle of Higher Education,* Technology Update, Beverly T. Watkins.

March 8, Herald-American, Syracuse, New York. "Software Would Teach how to Learn." Mention of research and NSF award, quotation.

March, UCSC Currents Vol. 2, No. 6, article and photo.

February 21, San Francisco Examiner, Keay Davidson, "Down to a Science", mention of research and NSF award, quotation.

February 18, UCSC Public Information Office Press Release, Robert Irion.

December, *Int'l Computer Chess Association Journal,* many citations and quotations, photo.

Collaborative Efforts and Sabbatical Visitors

1999-2000 Professor Tae Kyung Lee, Dept. of Computer Science, College of Natural Science, Dongguk University, North Korea. Sabbatical Visitor.

1996– Invited Member: Round Table Group, International think tank of 10,000 scholars. http://www.round.table.com/rtg/.

1996–1998 Advisor to TEAMGO. An International collaborative effort to develop a competitive GO-playing program. Managed by Gary Boos.

1991–95 Co-coordinator (with G. Ellis) of PEIRCE: A Conceptual Graph Work Bench - International non-proprietary effort. Over 80 participants in twelve countries worldwide. Also leader of subgroup on learning mechanisms and major participant in database subgroup.

Literature Refereed and Conference Committees

2002 On AI Game Interface Standards Committee: Working Group on Decision Trees.

2002 Reviewer for Computers and Games 2002, Edmonton Canada.

2001-2002 Program Committee Member for The 2002 International Conference on Artificial Intelligence (IC-AI'02) and Machine Learning and Applications (ICMLA'02) Las Vegas, Nevada, USA June 24-27, 2002.

2001 Reviewer for ACM Crossroads Magazine - special issue on Artificial Life.

2001 PhD Examiner. Royal Melbourne Institute of Technology, Australia.

2000-2001 Reviewer for California Engineer magazine, Student Journal of the UC Engineering Colleges.

2000-2001 General Chair for International Conference on Conceptual Structures, Stanford University, August, 2001.

2000 Program Committee for The 2000 International Conference on Artificial Intelligence (IC-AI'2000). Monte Carlo Resort, Las Vegas, June 26-29,2000.

2000 Reviewer: McGraw-Hill

2000 Reviewer: Electronics and Telecommunications Research Institute Journal, Korea.

1999-2001 On Editorial Board of Multi-Sensor Information Fusion Journal, Elsevier Science. Editor-in-Chief: Belur Dasarathy.

1999-2001 Review Board member, International Journal of Applied Intelligence: (Artificial Intelligence, Neural networks and Complex Problem-Solving) , Kluwer Academic Press.

1999 Plenary Session Chair, Second International Conference on Information Fusion.

1999–2000 Reviewer: Special Issue of Theoretical Computer Science on Computers and Games.
Reviewer: Artificial Intelligence, Second Edition by Elaine Rich and Kevin Knight, McGraw-Hill Publisher.
Reviewer: Annals of Operations Research (AOR)

1998–99 On Organizing Committee for International Society of Information Fusion.

Publication Chair for Second International Conference on Multisource-Multisensor Data Fusion, Sunnyvale, CA, July 1999.

On Steering Committee for Seventh International Conference on Conceptual Structures, Virginia Tech., August, 1999.

1998- Reviewer: Computational Intelligence
Reviewer: ICCA Journal
Reviewer: First International Conference on Computers and Games '98. Tsukuba, Japan. Reviewer: Special Volume of Annals of Operations Research on Applied Mathematical Programming and Modeling.

On Program Committee and Journal Publication Committee for International Conference on Multisource-Multisensor Data Fusion, Las Vegas, Nevada, July 6 - 9, 1998.

Session Chair at EIS'98. Symposium on Engineering of Intelligent Systems, Tenerife, Spain, February 11-13, 1998.

1997–98 On Steering Committee and Program Committee for Sixth International Conference on Conceptual Structures, France, August, 1998.

1997 Session Chair at WOLLIC' 97: Workshop on Logic, Language, Information and Computation, Fortaleaza, Brazil, August, 1997.

Reviewer: Computational Intelligence
Reviewer: ICCA Journal
Grant Reviewer: Natural Sciences and Engineering Research Council of Canada (NSERC)

On Program Committee for Fifth International Conference on Conceptual Structures, Seattle, Washington, August 1997.

On Program Committee for KRUSE-97, 2nd International Symposium on Knowledge Retrieval, Use and Storage for Efficiency, August 11-13, Vancouver, Canada.

1996 Reviewer: Computational Intelligence
Reviewer: 8th Advances in Computer Chess Conference (ACC8), the Netherlands

On Program Committee and Editorial Committee for Fourth International Conference on Conceptual Structures, Australia, 1996.
Session Chair for conceptual graphs and Peirce theory.

1995 Reviewer for International Computer Chess Association Journal
Reviewer for Computational Intelligence
Reviewer for Knowledge-Based Systems Journal
Grant Proposal Assessor, Australian Research Council
Guest Co-Editor, Special Issue of Computational Intelligence on Games: Planning and Learning.

Tenure Reviewer - Technion - Israel Institute of Technology

Co-Chair, Third International Conference on Conceptual Structures (in cooperation with AAAI), August 14-18, 1995, Santa Cruz.

Co-Chair, Conference on Knowledge Retrieval and Usage in Structured Environments, August 11-13, 1995, Santa Cruz.

1994 Reviewer for Australian Workshop on Conceptual Graphs
Reviewer for Machine Learning Journal
Reviewer for Knowledge-Based Systems Journal

1993 Proposal for NSF Directorate on Human Cognition and Perception
Paper for Machine Learning Journal, Kluwer
Paper for IEEE Transactions on Knowledge and Data Engineering
Proposals to NSF, Knowledge Models and Cognitive Systems Group.

Panelist on NSF Research Initiation Panel, Knowledge Models and Cognitive Systems Group, 22 twenty-page proposals reviewed, April 22-23, Washington, D.C.

On Program Committee for 1st International Conference for Conceptual Graphs, Montreal
Co-Chair Second Annual Workshop on the PEIRCE Conceptual Graphs Workbench, Montreal
Program Chair for AAAI Fall Symposium on Games: Planning and Learning
Vice Chair for AAAI Spring Symposium on AI, Reasoning and Creativity, Stanford University

1992 Co-Chair First Annual Workshop on the PEIRCE Conceptual Graph Workbench, July 10, 1992, Las Cruces, New Mexico.

1991 Section editor for the book AI and Creativity, Kluwer
Papers for Machine Learning Journal, Kluwer
Book: Computers for Artificial Intelligence Processing for IEEE

1990	National Research Council Panelist Journal of Computers and Mathematics with Applications McGraw-Hill - Uncertainty Management Texts
	On Program Committee for IEEE International Conference on Data Engineering, 1991, (Knowledge-Based Systems, Learning Systems)
1989	On Program Committee for IEEE International Conference on Data Engineering, 1990, (Knowledge-Based Systems Division)
	Reviewer for Tetrahedron Computing Methodology
1988	Auxiliary Reviewer for AAAI-88
1986	On Program Committee for IEEE Applications of AI
1985	IBM Journal Papers Proposals to NSF

Research Summary

Robert Levinson's research crosses the broad spectrum of topics in Artificial Intelligence research - specifically in the areas of machine learning, heuristic search, knowledge representation, associative pattern retrieval and machine creativity. His major project, unifying his research, has been an adaptive pattern-oriented chess system named Morph, a system that learns to play respectable chess from its experience only.

Levinson's primary research goal is to give computers the benefit of experience. He believes that the fact that most computers do not make use of previous experience is a tremendous waste of computation. To serve his research goal he has developed a domain-independent learning architecture APS by which systems can improve their decision making and predictive abilities over time with little human assistance. To further his goal he has developed sophisticated algorithms for the associative retrieval of structural patterns. His algorithms for the associative retrieval of semantic networks are being used at the core of PEIRCE, a conceptual graphs workbench. PEIRCE is being built by an International Collaboration of 80 researchers from 12 different countries that Levinson and his PhD student founded in 1992. Levinson's methods have been or are currently being applied in the domains of organic chemistry, signal recognition, image alignment, medical diagnosis, and manufacturing systems design in addition to chess and other games.

UNIVERSITY SERVICE

Administrative Appointments

2000–	adhoc committee for Tenure case in EE department.
2000–	Academic Senate Career Advising Committee
1998–	Academic Senate Affirmative Action Committee (see http://senate.ucsc.edu/caa/index.html)
1997–98	CS Undergraduate Director, Representative for CS at Summer Advising Workshop, Substitute on Academic Senate Curriculum Committee
1996–97	CS Undergraduate Director and Member of Committee, Representative for CS at Summer Advising Workshop
1995–96	CIS Undergraduate Committee, Representative for CIS at Summer Advising Workshop
1993–95	CIS Undergraduate Director
1992–	Faculty Affiliate: Stevenson College
1991–92	CIS Assistant Graduate Director
1988–90	CIS Undergraduate Director

1987–88 Seminar Coordinator

1986–87 CIS Assistant Graduate Director

TEACHING 1985–86

				Enrolled	%Eval Retd	Shared?
Spring	CIS	101	Data Structures	28	36	No
	CIS	180	Database Systems	22	82	No
	CIS	301	Supervised Teaching Experience	2	0	No

TEACHING 1986–87

				Enrolled	%Eval Retd	Shared?
Fall	CIS	130	Computational Models	50	78	No
	CIS	297	Independent Study/Research	2	0	No
	CIS	301	Supervised Teaching Experience	1	0	No
Winter	CIS	195	Senior Thesis	2	0	No
	CIS	240	Artificial Intelligence	18	72	No
	CIS	297	Independent Study/Research	2	0	No
Spring	CIS	241	Knowledge Engineering	10	100	No

TEACHING 1987–88

				Enrolled	%Eval Retd	Shared?
Fall	CIS	130	Computational Models	55	93	No
	CIS	240	Artificial Intelligence	12	100	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	1	0	No
	CIS	301	Supervised Teaching Experience	2	100	No
Winter	CIS	241	Knowledge Engineering	3	100	No
	CIS	297	Independent Study/Research	2	0	No
	CIS	299	Thesis Research	1	0	No
Spring	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	1	0	No

TEACHING 1988–89

				Enrolled	%Eval Retd	Shared?
Fall	CIS	240	Artificial Intelligence	12	83	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	2	0	No
Winter	CIS	241	Knowledge Engineering	3	100	No
	CIS	299	Thesis Research	2	0	No
Spring	CIS	60N	Begin Programming: Natural Sciences	50	50	No
	CIS	140	Artificial Intelligence	28	64	No
	CIS	299	Thesis Research	1	0	No
	CIS	301	Supervised Teaching Experience	3	33	No

TEACHING 1989–90

				Enrolled	%Eval Retd	Shared?
Fall	CIS	240	Artificial Intelligence	9	78	No
	CIS	299	Thesis Research	2	0	No
Winter	CIS	131	Semantics of Programming Languages	33	61	No
	CIS	195	Senior Thesis	1	0	No
	CIS	198	Independent Study/Research	2	0	No
	CIS	241	Knowledge Engineering	7	100	No
	CIS	301	Supervised Teaching Experience	1	0	No
Spring	CIS	140	Artificial Intelligence	12	100	No
	CIS	195	Senior Thesis Research	2	0	No
	CIS	198	Independent Study/Research	1	0	No
	CIS	297	Graduate Research	1	0	No
	CIS	301	Supervised Teaching Experience	1	100	No

TEACHING 1990–91

				Enrolled	%Eval Retd	Shared?
Fall	CIS	240	Artificial Intelligence	16	94	No
	CIS	297	Independent Study/Research	1	0	No
Winter	CIS	241	Knowledge Engineering	8	75	No
	CIS	299	Thesis Research	1	0	No
Spring	CIS	297	Independent Study/Research	1	0	No

TEACHING 1991–92

				Enrolled	%Eval Retd	Shared?
Fall	CIS	240	Artificial Intelligence	5	100	No
	CIS	297	Independent Study/Research	4	0	No
	CIS	299	Thesis Research	3	0	No
Winter	CIS	140	Artificial Intelligence	7	86	No
	CIS	195	Senior Thesis Research	1	0	No
	CIS	198	Independent Study/Research	3	0	No
	CIS	297	Independent Study/Research	4	0	No
	CIS	299	Thesis Research	3	0	No
Spring	On Sabbatical Leave					
	CIS	195	Senior Thesis Research	1	0	No
	CIS	198	Independent Study/Research	3	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	4	0	No

TEACHING 1992–93

				Enrolled	%Eval Retd	Shared?
Fall	CIS	195	Senior Thesis Research	1	0	No
	CIS	240	Artificial Intelligence	3+3	50	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	4	0	No
Winter	CIS	198	Independent Study/Research	1	0	No
	CIS	241	Knowledge Engineering	3	100	No
	CIS	297	Independent Study/Research	1	0	No

	CE	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	3	0	No
	CE	299	Thesis Research	1	0	No
Spring	CIS	140	Artificial Intelligence	11	73	No
	CIS	198	Independent Study/Research	2	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	1	0	No
	CIS	301	Supervised Teaching Experience	1	0	No

TEACHING 1993–94

				Enrolled	%Eval Retd	Shared?
Fall	CIS	198	Independent Study/Research	1	0	No
	CIS	240	Artificial Intelligence	12	67	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	2	0	No
Winter	CIS	001	Intro Computer Science	71	49	No
	CIS	180	Database Systems	30+1	81	No
	CIS	198	Independent Study/Research	1	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	2	0	No
	CIS	301	Supervised Teaching Experience	3	67	No
Spring	CIS	198	Independent Study/Research	1	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	2	0	No

TEACHING 1994–95

				Enrolled	%Eval Retd	Shared?
Fall	CIS	240	Artificial Intelligence	10	100	No
	CIS	299	Thesis Research	3	0	No
Winter	CIS	241	Knowledge Engineering	9	89	No
	CIS	299	Thesis Research	2	0	No
Spring	CIS	80B	Systems and Simulation	75+1	38	No
	CIS	140	Artificial Intelligence	11	72	No
	CIS	198	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	5	0	No
	CIS	301	Supervised Teaching Experience	2	0	No

TEACHING 1995–96

				Enrolled	%Eval Retd	Shared?
Fall	CIS	240	Artificial Intelligence	7	100	No
	CIS	299	Thesis Research	2	0	No
Winter	CIS	140	Artificial Intelligence	15	100	No
	CIS	198	Independent Study/Research	3	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	4	0	No
Spring			SABBATICAL LEAVE			
	CIS	198	Independent Study/Research	1	0	No
	CIS	198F	Independent Study/Research	1	0	No

	CIS	297	Independent Study/Research	1	0	No

TEACHING 1996–97

				Enrolled	%Eval Retd	Shared?
Fall	CS	195	Senior Thesis Research	1	0	No
	CS	240	Artificial Intelligence	12	100	No
Winter	CS	140	Artificial Intelligence	14	86	No
	CS	195	Senior Thesis Research	1	0	No
	CS	241	Knowledge Engineering	4	100	No
	CS	297	Independent Study/Research	1	0	No
Spring	CS	80B	Systems and Simulation	45	64	No
	CS	195	Senior Thesis Research	1	0	No
	CS	195F	Senior Thesis Research	1	0	No
	CS	198	Independent Study/Research	1	0	No
	CS	297	Independent Study/Research	1	0	No
	CS	299	Thesis Research	3	0	No
	CS	301	Supervised Teaching Experience	1	0	No

TEACHING 1997–98

				Enrolled	%Eval Retd	Shared?
Fall	CS	130	Computational Models	64	81	No
	CS	240	Artificial Intelligence	8	100	No
	CS	297	Independent Study/Research	1	0	No
	CS	301	Supervised Teaching Experience	1	0	No
Winter	CS	140	Artificial Intelligence	27	89	No
	CS	195	Senior Thesis Research	1	0	No
	CS	297	Independent Study/Research	2	0	No
	CS	299	Thesis Research	3	0	No
Spring	CS	80B	Systems and Simulation	26	0	No
	CS	195	Senior Thesis Research	1	0	No
	CS	198	Independent Study/Research	1	0	No
	CS	297	Independent Study/Research	1	0	No

TEACHING 1998–99

				Enrolled	%Eval Retd	Shared?
Fall	CS	130	Computational Models	65	74	No
	CS	198	Independent Study/Research	3	0	No
	CS	240	Artificial Intelligence	18	94	No
	CS	297	Independent Study/Research	1	0	No
	CS	299	Thesis Research	2	0	No
	CE	299	Thesis Research	1	0	No
	CS	301	Supervised Teaching Experience	1	0	No
Winter	CS	198	Independent Study/Research	1	0	No
	CS	241	Knowledge Engineering	3	100	No
	CS	297	Independent Study/Research	1	0	No
	CS	299	Thesis Research	2	0	No
	CE	299	Thesis Research	2	0	No
Spring	CS	080	Systems and Stimulation	44	73	No

	CS	198	Independent Study/Research	1	0	No
	CS	299	Thesis Research	2	0	No
	CS	301	Thesis Research	1	0	No

TEACHING 1999–00

				Enrolled	%Eval Retd	Shared?
Fall	CS	195	Sr Thesis Research	1	0	No
	CS	198	Independent Study/Research	1	0	No
	CS	240	Artificial Intelligence	14	86	No
	CS	297	Independent Study/Research	1	0	No
	CS	299	Thesis Research	1	0	No
Winter	CS	140	Artificial Intelligence	21	95	No
	CS	195	Sr.Thesis Research	1	0	No
	CS	198	Independent Study/Research	1	0	No
	CS	299	Thesis Research	1	0	No
Spring	On Sabbatical Leave					
	CS	198	Independent Study/Research	2	0	No
	CE	299	Thesis Research	1	0	No

OTHER TEACHING

College Course: Teach Lisp Lab for CIS140 - Spring 1995.
Teach Lisp Lab for CIS140 - Winter 1996.
Summer Orientation - Summer 1997
Teach Lisp Lab for CIS140 - Winter 1998.
Summer Orientation - Summer 1998

1995: supervised both Che Hammond and Jonathan Allen.
as Mentor for UCSC California Alliance for Minority Participation (CAMP)
Weekly meetings.

1996: Assisted Database Development for Inventory Control at KRESGE COOP with Gilad Buzi.
2002: UC LEADS Mentor for: Lucy

Theses Supervised

1999 - MS - Andrew McGinities - Compression and the 3x3 Tile Puzzle
Current - Ph.D. - Gil Fuchs - " Intelligent Information Retrieval Using Conceptual Structures".
1998 - Ph.D. - Emdad Khan - "Robust Speech Recognition Using a Noise Rejection Approach"
1996 - MS - John Stewart - "An Existential Graphs - Based Theorem Prover"
1995 - Ph.D. - Gerard Ellis - "Sorting logics makes them more efficient"
1993 - MS - Richard Snyder - "Distance: Toward the Unification of Chess Knowledge"
1992 - MS - Jeff Gould - "The Development and Testing of an Adaptive Chess System"
1989 - MS - Esther Lum - "An Implementation of the Key Reaction Approach in Computer
— Chemical Synthesis"
1988 - MS - Don Kimber - "The Evolution of Molecular Automata"
1988 - MS - Bernard Riff - "Searching of a Partially-Ordered Knowledge Base of Complex Objects"

Senior Theses Supervised

2000 - Ryan Weber - “Decision Trees and Data Compression” (in progress)
1995 - John Amenta - “An Implementation of Vector-Morph”
1993 - Steve Barnes - “Implementing Associative Retrieval in a Database of Graph Structures”
– - Highest Honors
1991 - Paul Zola - “The Implementation of a Self-Learning Chess Program” - Highest Honors
1991 - Steve Grimm - “A Pattern-Matching Approach to the Tile Puzzles” - Honors
1989 - Chris Hart - “Computer Generated Counterpoint Harmony”

Thesis Committee Member

2002 - MS - Madhu Subramainian 2002 - PhD - Jonathan Pantaj (as advancement chair)
2001 - MS - Lisa Meteyer
2001 - MS - Michael Mathiesman
2000 - MS - Steve Barnes
1999 - MS - Edward Parrish
1998 - MS - Jose Renteria
1996 - Sr. - Paul Kanieski
1996 - MS - Raksas Hang
1995 - PhD - Don Roberts
1994 - Sr. - Joseph Russack
1993 - MS - Claude Noshpitz
1993 - MS - Kyle Smith
1990 - Ph.D. - Guila Pagallo
1990 - MS - Don Roberts
1989 - MS - Tracy Roberts
1988 - MS - Matthew Chacko
1988 - MS - John Colby
1987 - Sr - Ian-Breac Macleod
1985 - Ph.D. - George Politowski

Ph.D. Qualifying Exam Committee Member

2001 - Shuo Zhang 1998 - Rich McClellan (Chemistry)
1998 - Gil Fuchs
1997 - Emdadur Khan
1995 - Rodrigo Garces
1995 - John Lawton (Chemistry)
1995 - Jim Arnold (Chemistry)
1994 - Mick Kappler (Chemistry)
1994 - Don Roberts
1994 - David Staepelaere

Advisor to Continuing Graduate Students

Gil Fuchs - Ph.D.
Matt Xia - Ph. D.