RICHARD K. BELEW

Curriculum Vitæ

Univ. California – San Diego
9500 Gilman Dr. (0515)
La Jolla, CA 92093-0515
(858) 534 - 2601
rik@cogsci.ucsd.edu
http://www.cogsci.ucsd.edu/~rik

Employment history

1986-1992 Assistant Professor, Computer Science & Engr., UC San Diego

1992-1998 Associate Professor, Computer Science & Engr., UC San Diego

1998-2002 Professor, Computer Science & Engr., UC San Diego

2002-present Professor, Cognitive Science, UC San Diego

2004-2005 Department Chair, Cognitive Science, UC San Diego

Education:

B.S. Math., Univ. Minnesota, Minneapolis, MN, 1979.
M.S. Computer Science, Univ. Michigan, Ann Arbor, MI, 1984.
Ph.D. Computer Science, Univ. Michigan, Ann Arbor, MI, 1986.

Research Areas:

Adaptive knowledge representation: integration of new insights derived from low-level machine learning (data-mining) techniques with other representations of related human knowledge. Primary application are to the search for free-text documents, patterns across genome/proteome sequences, models of the coevolution of drug resistance, and drug design.

Graduate student advising

Name	Year, Degree	Dissertation title	Current Affiliation
John Renzepis	1990, MS	HyperMail: Treating Electronic Mail as Literature	
Dan Rose	1991, PhD	A symbolic and connectionist approach to legal information retrieval	Yahoo! Search
John McInerney	1992, PhD	Biologically influenced algorithms and parallelism in non-linear optimization	Hewlett-Packard
William Hart	1994, PhD	Adaptive global optimization with local search	Sandia National Labs
Amy Steier	1994, PhD	Statistical semantics of phrases in hierarchical contexts	WebSense
John Hatton	1995, MS	RAVE Reviews: Acquiring relevance assessments from multiple users	SIL (Summer Inst. of Linguistics)
Chris Rosin	1997, PhD	Coevolutionary search among adversaries	Parity Computing
Thomas Kammeyer	1998, PhD	Evolving stochastic grammars	TomoTherapy
Mark Land	1998, PhD	Evolutionary Algorithms with Local Search for Combinatorial Optimization	Parity Computing
Filippo Menczer	1998, PhD	Life-like agents : internalizing local cues for reinforcement learning and evolution	Informatics Dept., Univ. Indiana
Brian Tower	2002, MS	Hierarchical Docking: Reconciling Textual Ontologies with Keyword Statistics and Structural Analysis	
Melanie Dumais	2002, MS	Applying distributed agent populations that induce vocabularies to explore latent energy environments	Axion Racing
Robert Liebscher	2005, PhD	Temporal, Categorical, and Network Context of Scientific Documents: Applications and Implications	Knova Software

Funded Research

- Academic Institutional Memory: Analyzing the Electronic Artifacts of Scientific Culture
  NSF - IRI #8902880 1989-1991 $70,000 co-PI, with Edwin Hutchins
- Unrestricted research funds, hardware contributions
  Apple Computer 1992-1994 $100,000
- Learning Semantic Representations for Information Retrieval
  NSF - IRI #9221276 1993-1997 $215,000 co-PI, with Garrison W Cottrell

- Active Learning for Text Scene and Biosequence Analysis
  NSF - IIS #9617307 1997-1999 $40,000 co-PI, with Garrison W Cottrell, Charles P Elkan, Eric Mjolsness
- Empirical Analysis of Search Spaces Using Population-Based Sampling
  NSF - EIA #9734880 1998-2000 $125,043 co-PI, with Russell Impagliazzo
- UCSD Active Web
  NSF - CCR #9802219 1998-2003 $1,499,969 co-PI, with Joseph Pasquale, Russell Impagliazzo, Venkat Rangan, Jeanne Ferrante
- Hierarchical Docking: Reconciling Textual Ontologies with Keyword Statistics and Structural Analysis
  Encyclopedia Britannica 2001-2002 $50,000
- Drug Design Cycle: Targeting HIV Protease Resistance
  NIH #P01GM4887 2002-2007 $132,747 co-PI, with Art Olson (TSRI)

Professional Activities:

Editorial Board

- *Evolutionary Computation*
- *Artificial Life*
- *Adaptive Behavior*

Program Chair:

- Artificial Life (1998, co-chair)
- Foudations of Genetic Algorithms (1996, co-chair)
- Intl. Conf. on Genetic Algorithms (1991)

Program Committee, Advisory Boards

- National Science Foundation, CISE/IIS Committee of Visitors
- National Institute of Health, NLM/NCBI Board of Science
- Cold Spring Harbor, Reactome.org Science Advisory Board
- Intl. Conf. on R&D in Information Retrieval (ACM-SIGIR)
- Intl. Conf. on Machine Learning
- Intl. Conf. on Genetic Algorithms
- Intelligent Systems in Molecular Biology (ISMB)
- American Association for Artificial Intelligence (AAAI)

Primary consulting engagements

- Encyclopedia Britannica (1992-2000)
- ContentScan.com (2000-2004)
- West Group (now Thomson Legal) (1998)
- DisneyOnline (1996)

Citations listed in reverse chronological order,
reverse alphabetic within year(:

References

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[2] R. K. Belew and M. Chang. Modeling recombination's role in the evolution of HIV drug resistance. In Luis M. Rocha, Mark Bedau, Dario Floreano, Robert Goldstone, Alessandro Vespignani, and Larry Yaeger, editors, *Artificial Life X: The Tenth International Conference on the Synthesis and Simulation of Living Systems*. MIT Press, 2006.

[3] Robert Liebscher. *Temporal, Categorical, and Network Context of Scientific Documents: Applications and Implications*. PhD thesis, Univ. California – San Diego, 2005.

[4] R. Liebscher and Richard K. Belew. Temporal feature selection for text categorization. Technical report, Cognitive Science Department, UC San Diego, 2004.

[5] Richard K. Belew and Max Chang. Purposeful retrieval: Applying domain insight for topically-focused groups of biologists. In Javed Mostafa and Padmini Srinivasan, editors, *Search and Discovery in Bioinformatics: SIGIR 2004 Workshop*, 2004.

[6] R. Liebscher and Richard K. Belew. Lexical dynamics and conceptual change: Analyses and implications for information retrieval. *Cognitive Science Online*, 1(2), 2003.

[7] Richard K. Belew, Robert Finn, and Alex Bateman. Literature and its referents: Analyzing pubmed citations across pfam. In *Intelligent Systemes in Molecular Biology*, 2002. POSTER.

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[9] R. K. Belew. *Finding Out About: A cognitive perspective on search engine technologies and the WWW*. Cambridge Univ. Press, 2000.

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[11] C. Mautner and R.K. Belew. Evolving robot morphology and control. In K. Aihara, editor, *Fourth International Symposium on Artificial Life and Robotics*, 1999.

[12] C. Mautner and R. K. Belew. Coupling morphology and control in an simulated robot. In D. Goldberg, editor, *Genetic & Evolutionary Computation Conference (GECCO99)*, 1999.

[13] C.D. Rosin, R.K. Belew, G.M. Morris, A.J. Olson, and D.S. Goodsell. Computational coevolution of antiviral drug resistance. In C. Adami, R.K. Belew, H. Kitano, and C.E. Taylor, editors, *Proceedings of The Sixth International Conference on Artificial Life*, pages 81–90. MIT Press, 1998.

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[17] F. Menczer. *Life-like agents : internalizing local cues for reinforcement learning and evolution*. PhD thesis, Computer Science & Engr. Dept. - Univ. Calif. San Diego, 1998.

[18] M. Land. *Evolutionary Algorithms with Local Search for Combinatorial Optimization*. PhD thesis, Computer Science & Engr. Dept. - Univ. Calif. San Diego, 1998.

[19] T. Kammeyer. *Evolving stochastic grammars*. PhD thesis, Computer Science & Engr. Dept. - Univ. Calif. San Diego, 1998.

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