William B. Langdon

This appendix contains bibliographic references to publications concerning genetic programming. Some effort has been made to make it as complete as possible but, like every such list, this is practically impossible and the list quickly becomes out of date as the field progresses. Nevertheless we hope that this appendix will prove a useful reference. The list is sorted into principle subject area. Within subject areas, publications are sorted by date (but works by the same author are grouped together).

Where on-line copies are available, the standard bibliographic reference is followed by the address of the on-line version using the *Universal Reference Location* (URL) format. Internet document servers are occasionally unavailable and are sometimes re-organized so documents may be moved to new URLs, therefore a degree of perseverance may be required to obtain on-line copies.

A small number of non-genetic programming papers have been included either for their historical significance or general interest to practitioners of genetic programming. These are marked thus [1].

B.1 Introductions to Genetic Programming

Koza, J. R. (1992f), "The genetic programming paradigm: Genetically breeding populations of computer programs to solve problems," in *Dynamic, Genetic, and Chaotic Programming*, B. Soucek and the IRIS Group (Eds.), pp 203–321, New York: John Wiley.

Koza, J. R. (1994k), "Introduction to genetic programming," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Cambridge, MA, USA: MIT Press.

Koza, J. R. (1994j), "Genetic programming: On the programming of computers by means of natural selection," *Statistics and Computing*, 4(2).

Hampo, R. (1992a), "Genetic programming: A new paradigm for control and analysis," in *Third ASME Symposium on Transportation Systems*, pp 155–163, Invited Paper at ASME Winter Annual Meeting, 9–13 November, Anaheim, California, USA.

Hampo, R. J. (1992b), "The genetic programming paradigm: A new tool for analysis and control," Ford Proprietary.

Beard, N. (1993), "The joy of genetic programming," *Personal Computer World*, pp 471–472.

Kinnear, Jr., K. E. (1994d), "A perspective on the work in this book," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 1, pp 3–19, MIT Press.

Angeline, P. J. (1995), "Evolution revolution: An introduction to the special track on genetic and evolutionary programming," *IEEE Expert*, 10(3):6–10, Guest editor's introduction.

Angeline, P. J. (1996a), "Genetic programming's continued evolution," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 1, Cambridge, MA, USA: MIT Press.

Langdon, W. B. (1994), "Quick intro to simple-gp.c," Internal Note IN/95/2, University College London, Gower Street, London WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/gp-code/simple/intro-simple-gp.ps`

Nachbar, R. B. (1995), "Genetic programming," *The Mathematica Journal*, 5(3):44–55.

B.2 Surveys of Genetic Programming

Angeline, P. J. (1994a), "Genetic programming: A current snapshot," in *Proceedings of the Third Annual Conference on Evolutionary Programming*, D. B. Fogel and W. Atmar (Eds.), Evolutionary Programming Society.

Langdon, W. B. and Qureshi, A. (1995), "Genetic programming – computers using "natural selection" to generate programs," Research Note RN/95/76, University College London, Gower Street, London WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/surveyRN76.ps`

B.3 Early Work on Genetic Algorithms that Evolve Programs

Forsyth, R. (1981), "BEAGLE A darwinian approach to pattern recognition," *Kybernetes*, 10:159–166.

Forsyth, R. and Rada, R. (1986), *Machine Learning applications in Expert Systems and Information Retrieval*, Ellis Horwood series in artificial intelligence, Chichester, UK: Ellis Horwood.

Cramer, N. L. (1985), "A representation for the adaptive generation of simple sequential programs," in *Proceedings of an International Conference on Genetic Algorithms and the Applications*, J. J. Grefenstette (Ed.), pp 183–187.
`ftp://ftp.bbn.com/pub/ncramer/gp/icga85.txt`

Schmidhuber, J. (1986), "Der genetische algorithmus: Eine implemetierung in prolog," .

Schmidhuber, J. (1987), "Evolutionary principles in self-referential learning. on learning now to learn: The meta-meta-meta...-hook," Diploma thesis, Technische Universitat Munchen, Germany.

Bickel, A. S. and Bickel, R. W. (1987), "Tree structured rules in genetic algorithms," in *Genetic Algorithms and their Applications: Proceedings of the second International Conference on Genetic Algorithms*, J. J. Grefenstette (Ed.), pp 77–81, MIT, Cambridge, MA, USA: Lawrence Erlbaum Associates.

Fujiki, C. and Dickinson, J. (1987), "Using the genetic algorithm to generate lisp source code to solve the prisoner's dilemma," in *Genetic Algorithms and their Applications: Proceedings of the second international conference on Genetic Algorithms*, J. J. Grefenstette (Ed.), pp 236–240, MIT, Cambridge, MA, USA: Lawrence Erlbaum Associates. [1]

De Jong, K. (1987), "On using genetic algorithms to search program spaces," in *Genetic Algorithms and their Applications: Proceedings of the second international conference on Genetic Algorithms*, J. J. Grefenstette (Ed.), pp 210–216, MIT, Cambridge, MA, USA: Lawrence Erlbaum Associates.

B.4 Some Early Genetic Programming References

Koza, J. R. (1989), "Hierarchical genetic algorithms operating on populations of computer programs," in *Proceedings of the Eleventh International Joint Conference on Artificial Intelligence IJCAI-89*, N. S. Sridharan (Ed.), volume 1, pp 768–774, Morgan Kaufmann.

Koza, J. (1990a), "Genetic programming: A paradigm for genetically breeding populations of computer programs to solve problems," Technical Report STAN-CS-90-1314, Dept. of Computer Science, Stanford University.

Koza, J. R. (1990c), "Genetically breeding populations of computer programs to solve problems in artificial intelligence," in *Proceedings of the Second International Conference on Tools for AI, Herndon, Virginia, USA*, pp 819–827, IEEE Computer Society Press, Los Alamitos, CA, USA.

Koza, J. R. (1990d), "Integrating symbolic processing into genetic algorithms," in *Workshop on Integrating Symbolic and Neural Processes at AAAI-90*, AAAI.

Koza, J. R. (1992e), *Genetic Programming: On the Programming of Computers by Natural Selection*, Cambridge, MA, USA: MIT Press.

Koza, J. R. and Rice, J. P. (1992b), *Genetic Programming:The Movie*, Cambridge, MA, USA: MIT Press.

Koza, J. R. (1991c), "Evolving a computer program to generate random numbers using the genetic programming paradigm," in *Proceedings of the Fourth International Conference on Genetic Algorithms*, R. Belew and L. Booker (Eds.), pp 37–44, Morgan Kaufmann.

Jones, A. (1991), "Writing programs using genetic algorithms," Master's thesis, Department of Computer Science, University of Manchester, United Kingdom.

B.5 GP Techniques and Theory

B.5.1 Different Representations for the Evolving Programs

B.5.1.1 Directed Graph Structured Programs

Teller, A. (1995b), "Language representation progression in genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 106–113, MIT, Cambridge, MA, USA: AAAI.

B.5.1.2 Strongly Typed GP – Multiple Function and Data Types Within a Program

Montana, D. J. (1993), "Strongly typed genetic programming," BBN Technical Report #7866, Bolt Beranek and Newman, Inc., 10 Moulton Street, Cambridge, MA 02138, USA.
`ftp://ftp.io.com/pub/genetic-programming/papers/stgp.ps.Z`

Montana, D. J. (1994), "Strongly typed genetic programming," BBN Technical Report #7866, Bolt Beranek and Newman, Inc., 10 Moulton Street, Cambridge, MA 02138, USA.
`ftp://ftp.io.com/pub/genetic-programming/papers/stgp2.ps.Z`

Montana, D. J. (1995), "Strongly typed genetic programming," *Evolutionary Computation*, 3(2):199–230.

Haynes, T., Wainwright, R., Sen, S., and Schoenefeld, D. (1995b), "Strongly typed genetic programming in evolving cooperation strategies," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 271–278, Pittsburgh, PA, USA: Morgan Kaufmann.
`http://euler.mcs.utulsa.edu/~haynes/haynes.html`

Haynes, T. D., Schoenefeld, D. A., and Wainwright, R. L. (1996), "Type inheritance in strongly typed genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 18, Cambridge, MA, USA: MIT Press.

B.5.1.3 Using a Fixed or Evolving Syntax to Guide GP Search

Stefanski, P. A. (1993), "Genetic programming using abstract syntax trees," Notes from Genetic Programming Workshop at ICGA-93.
`ftp://ftp.io.com/pub/genetic-programming/papers/ICGA-93-GP-Abstracts.ps.Z`

Whigham, P. A. (1995a), "Grammatical genetic learning and schemata: Restated," Technical Report CS13/95, Department of Computer Science, University College, University of New South Wales, Australia.

Whigham, P. A. (1995b), "Grammatically-based genetic programming," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 33–41.

Whigham, P. A. (1995c), "Inductive bias and genetic programming," in *First International Conference on Genetic Algorithms in Engineering Systems: Innovations and Applications, GALESIA*, A. M. S. Zalzala (Ed.), volume 414, pp 461–466, Sheffield, UK: IEE.

Aytekin, T., Korkmaz, E. E., and Güvennir, H. A. (1995), "An application of genetic programming to the 4-OP problem using map-trees," in *Progress in Evolutionary Computation*, X. Yao (Ed.), volume 956 of *Lecture Notes in Artificial Intelligence*, pp 28–40, Heidelberg, Germany: Springer-Verlag.

Iba, H., de Garis, H., and Sato, T. (1995a), "Recombination guidance for numerical genetic programming," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

Iba, H. and de Garis, H. (1996), "Extending genetic programming with recombinative guidance," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 4, Cambridge, MA, USA: MIT Press.

Whitley, D., Gruau, F., and Pyeatt, L. (1995), "Cellular encoding applied to neurocontrol," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 460–467, Pittsburgh, PA, USA: Morgan Kaufmann.

Gruau, F. (1996), "On using syntactic constraints with genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 19, Cambridge, MA, USA: MIT Press.

Langdon, W. B. (1995b), "Directed crossover within genetic programming," Research Note RN/95/71, University College London, Gower Street, London WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/directed_crossover.ps`

Teller, A. (1996), "Evolving programmers: The co-evolution of intelligent recombination operators," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 3, Cambridge, MA, USA: MIT Press.

Angeline, P. J. (1996b), "Two self-adaptive crossover operators for genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 5, Cambridge, MA, USA: MIT Press.

Wong, M. L. and Leung, K. S. (1995b), "Applying logic grammars to induce sub-functions in genetic programming," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.5.1.4 Pedestrian GP – Converting a Linear Chromosome to a Program

Banzhaf, W. (1993a), "Genetic programming for pedestrians," MERL Technical Report 93-03, Mitsubishi Electric Research Labs, Cambridge, MA, USA.
`ftp://lumpi.informatik.uni-dortmund.de/pub/biocomp/pedes93.ps.gz`

Banzhaf, W. (1993b), "Genetic programming for pedestrians," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, Morgan Kaufmann.
`ftp://ftp.io.com/pub/genetic-programming/GenProg_forPed.ps.Z`

Banzhaf, W. (1994), "Genotype-phenotype-mapping and neutral variation – A case study in genetic programming," in *Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 322–332, Jerusalem: Springer-Verlag.
`ftp://lumpi.informatik.uni-dortmund.de/pub/biocomp/ppsn94.ps.gz`

B.5.1.5 Stack Based GP – Linear Chromosome Executed by Stack Based Virtual Machine

Perkis, T. (1994), "Stack-based genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 148–153, Orlando, Florida, USA: IEEE Press.

B.5.1.6 Machine Code GP – Linear Chromosome Executed by CPU Directly

Nordin, P. (1994), "A compiling genetic programming system that directly manipulates the machine code," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 14, MIT Press.

Nordin, P. and Banzhaf, W. (1995b), "Evolving turing-complete programs for a register machine with self-modifying code," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 318–325, Pittsburgh, PA, USA: Morgan Kaufmann.
`ftp://lumpi.informatik.uni-dortmund.de/pub/biocomp/icga95-1.ps.gz`

Crepeau, R. L. (1995), "Genetic evolution of machine language software," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 121–134.

B.5.2 GP with other techniques

B.5.2.1 Minimum Description Length

Iba, H., Karita, T., de Garis, H., and Sato, T. (1993c), "System identification using structured genetic algorithms," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, pp 279–286, Morgan Kaufmann.

Iba, H., de Garis, H., and Sato, T. (1994a), "Genetic programming using a minimum description length principle," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 12, pp 265–284, MIT Press.

Iba, H. and Sato, T. (1992b), "Meta-level strategy learning for GA based on structured representation," in *Proceedings of the Second Pacific Rim International Conference on Artificial Intelligence*.

Iba, H. and Sato, T. (1992a), "Extension of STROGANOFF for symbolic problems," Technical report ETL-TR-94-1, Electrotechnical Laboratory, 1-1-4 Umezono, Tsukuba-city, Ibaraki, 305, Japan.

Iba, H., Sato, T., and de Garis, H. (1994c), "System identification approach to genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, pp 401–406, Orlando, Florida, USA: IEEE Press.

Iba, H., Sato, T., and de Garis, H. (1995c), "Numerical genetic programming for system identification," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 64–75.

Zhang, B.-T. and Mühlenbein, H. (1995a), "Balancing accuracy and parsimony in genetic programming," *Evolutionary Computation*, 3(1):17–38.

Zhang, B.-T. and Mühlenbein, H. (1995b), "Bayesian inference, minimum description length principle, and learning by genetic programming," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 1–5.

Zhang, B.-T. and Mühlenbein, H. (1995c), "MDL-based fitness functions for learning parsimonious programs," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 122–126, MIT, Cambridge, MA, USA: AAAI.

Zhang, B.-T. and Mühlenbein, H. (1996), "Adaptive fitness functions for dynamic growing/pruning of program trees," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 12, Cambridge, MA, USA: MIT Press.

B.5.2.2 Inductive Logic Programming

Wong, M. L. and Leung, K. S. (1994a), "Inductive logic programming using genetic algorithms," in *Advances in Artificial Intelligence - Theory and Application II*, J. W. Brahan and G. E. Lasker (Eds.), pp 119–124, Ontario, Canada: I.I.A.S.

Wong, M. L. and Leung, K. S. (1994b), "Learning first-order relations from noisy databases using genetic algorithms," in *Proceedings of the Second Singapore International Conference on Intelligent Systems*, pp B159–164.

Wong, M. L. and Leung, K. S. (1995d), "Genetic logic programming and applications," *IEEE Expert*.

Wong, M. L. and Leung, K. S. (1995a), "An adaptive inductive logic programming system using genetic programming," in *Evolutionary Programming IV Proceedings of the Fourth Annual Conference on Evolutionary Programming*, J. R. McDonnell, R. G. Reynolds, and D. B. Fogel (Eds.), pp 737–752, San Diego, CA, USA: MIT Press.

Wong, M. L. and Leung, K. S. (1995f), "Learning programs in different paradigms using genetic programming," in *Proceedings of the Fourth Congress of the Italian Association for Artificial Intelligence*, Springer-Verlag.

Wong, M. L. and Leung, K. S. (1995e), "An induction system that learns programs in different programming languages using genetic programming and logic grammars," in *Proceedings of the 7th IEEE International Conference on Tools with Artificial Intelligence*.

Wong, M. L. and Leung, K. S. (1995c), "Combining genetic programming and inductive logic programming using logic grammars," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

Whigham, P. (1994), "Genetic programming and spatial information," in *Proceedings of the 7th Australian Joint Conference on Artificial Intelligence (AI'94)*, C. Zhang, J. Debenham, and D. Lukose (Eds.), pp 124–131, World Scientific Publishing Company.

Whigham, P. A. and McKay, R. I. (1995), "Genetic approaches to learning recursive relations," in *Progress in Evolutionary Computation*, X. Yao (Ed.), volume 956 of *Lecture Notes in Artificial Intelligence*, pp 17–27, Springer-Verlag.

Osborn, T. R., Charif, A., Lamas, R., and Dubossarsky, E. (1995), "Genetic logic programming," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.5.2.3 Binary Decision Trees

Yangiya, M. (1995), "Efficient genetic programming based on binary decision diagrams," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.5.2.4 GP Classifiers

Tufts, P. (1995a), "Dynamic classifiers: Genetic programming and classifier systems," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 114–119, MIT, Cambridge, MA, USA: AAAI.

B.5.3 Functional and Data Abstraction

B.5.3.1 Automatically Defined Functions

Koza, J. R. (1991f), "A hierarchical approach to learning the boolean multiplexer function," in *Foundations of genetic algorithms*, G. J. E. Rawlins (Ed.), pp 171–192, San Mateo, California, USA: Morgan Kaufmann.

Koza, J. R. (1993e), "Simultaneous discovery of detectors and a way of using the detectors via genetic programming," in *1993 IEEE International Conference on Neural Networks*, volume III, pp 1794–1801, San Francisco, USA, USA: IEEE.

Koza, J. R. (1994m), "Scalable learning in genetic programming using automatic function definition," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Cambridge, MA, USA: MIT Press.

Koza, J. R. (1993b), "Discovery of a main program and reusable subroutines using genetic programming," in *Proceedings of the Fifth Workshop on Neural Networks: An International Conference on Computational Intelligence: Neural Networks, Fuzzy Systems, Evolutionary Programming, and Virtual Reality*, pp 109–118.

Koza, J. R., Keane, M. A., and Rice, J. P. (1993), "Performance improvement of machine learning via automatic discovery of facilitating functions as applied to a problem of symbolic system identification," in *1993 IEEE International Conference on Neural Networks*, volume I, pp 191–198, San Francisco, USA: IEEE.

Koza, J. R. (1993f), "Simultaneous discovery of reusable detectors and subroutines using genetic programming," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, S. Forrest (Ed.), pp 295–302, Morgan Kaufmann.

Koza, J. R. (1994h), *Genetic Programming II: Automatic Discovery of Reusable Programs*, Cambridge Massachusetts: MIT Press.

Koza, J. R. (1994i), *Genetic Programming II Videotape: The next generation*, 55 Hayward Street, Cambridge, MA, USA: MIT Press.

Pringle, W. R. (1995), "ESP: Evolutionary structured programming," Technical report, Penn State University, Great Valley Campus, PA, USA.
`http://www.gv.psu.edu/personal/wrp103/wpr/esp.ps`

Spector, L. (1995), "Evolving control structures with automatically defined macros," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 99–105, MIT, Cambridge, MA, USA: AAAI.

Spector, L. (1996), "Simultaneous evolution of programs and their control structures," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 7, Cambridge, MA, USA: MIT Press.

Evolving ADF Architecture

Koza, J. R. (1994a), "Architecture-altering operations for evolving the architecture of a multipart program in genetic programming," Technical Report STAN-CS-94-1528, Dept. of Computer Science, Stanford University, Stanford, California 94305, USA.
`ftp://elib.stanford.edu/pub/reports/cs/tr/94/1528/CS-TR-94-1528.ps`

Koza, J. R. (1995a), "Evolving the architecture of a multi-part program in genetic programming using architecture-altering operations," in *Evolutionary Programming IV Proceedings of the Fourth Annual Conference on Evolutionary Programming*, J. R. McDonnell, R. G. Reynolds, and D. B. Fogel (Eds.), pp 695–717, San Diego, CA, USA: MIT Press.

Koza, J. R. (1995e), "Two ways of discovering the size and shape of a computer program to solve a problem," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 287–294, Pittsburgh, PA, USA: Morgan Kaufmann.

Koza, J. R. (1995b), "Gene duplication to enable genetic programming to concurrently evolve both the architecture and work-performing steps of a computer program," in *IJCAI-95 Proceedings of the Fourteenth International Joint Conference on Artificial Intelligence*, volume 1, pp 734–740, Montreal, Quebec, Canada: Morgan Kaufmann.

Koza, J. R. and Andre, D. (1995c), "Evolution of both the architecture and the sequence of work-performing steps of a computer program using genetic programming with architecture-altering operations," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 50–60, MIT, Cambridge, MA, USA: AAAI.

B.5.3.2 Module Acquisition as Population Evolves

Angeline, P. J. (1993), *Evolutionary Algorithms and Emergent Intelligence*, PhD thesis, Ohio State University.
`ftp://nervous.cis.ohio-state.edu/pub/papers/DISS/pja`

Angeline, P. J. and Pollack, J. B. (1992), "The evolutionary induction of subroutines," in *Proceedings of the Fourteenth Annual Conference of the Cognitive Science Society*, Lawrence Erlbaum.

Angeline, P. J. (1994b), "Genetic programming and emergent intelligence," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 4, MIT Press.

Kinnear, Jr., K. E. (1994b), "Alternatives in automatic function definition: A comparison of performance," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 6, MIT Press.

B.5.3.3 Adapting Program Primitives as Population Evolves

Rosca, J. P. and Ballard, D. H. (1994c), "Learning by adapting representations in genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence, Orlando, Florida, USA*, Orlando, Florida, USA: IEEE Press.
`ftp://ftp.cs.rochester.edu/pub/u/rosca/gp/94.ieee.adaptive_repr.ps.gz`

Rosca, J. P. and Ballard, D. H. (1994a), "Genetic programming with adaptive representations," Technical Report TR 489, University of Rochester, Computer Science Department, Rochester, NY, USA.

Rosca, J. P. and Ballard, D. H. (1994b), "Hierarchical self-organization in genetic programming," in *Proceedings of the Eleventh International Conference on Machine Learning*, Morgan Kaufmann.
`ftp://ftp.cs.rochester.edu/pub/u/rosca/gp/94.ml.hierarchical_so_gp.ps.Z`

Rosca, J. P. (1995d), "Genetic programming exploratory power and the discovery of functions," in *Evolutionary Programming IV Proceedings of the Fourth Annual Conference on Evolutionary Programming*, J. R. McDonnell, R. G. Reynolds, and D. B. Fogel (Eds.), pp 719–736, San Diego, CA, USA: MIT Press.
`ftp://ftp.cs.rochester.edu/pub/u/rosca/gp/95.ep.gpepdf.ps.gz`

Rosca, J. P. (1995b), "An analysis of hierarchical genetic programming," Technical Report 566, University of Rochester, Rochester, NY, USA.
`ftp://ftp.cs.rochester.edu/pub/u/rosca/gp/95.tr566.ps.gz`

Rosca, J. and Ballard, D. H. (1995), "Causality in genetic programming," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 256–263, Pittsburgh, PA, USA: Morgan Kaufmann.
`ftp://ftp.cs.rochester.edu/pub/u/rosca/gp/95.icga.causality.ps.gz`

Rosca, J. P. (1995f), "Towards a new generation of program synthesis approaches," in *Proceedings of the 7th International Conference on Software Engineering and Knowledge Engineering*, Skokie, IL 60076, USA: Knowledge Systems Institute.

Rosca, J. (1995a), "Towards automatic discovery of building blocks in genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 78–85, MIT, Cambridge, MA, USA: AAAI.

Rosca, J. P. and Ballard, D. H. (1996), "Discovery of subroutines in genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 9, Cambridge, MA, USA: MIT Press.

B.5.3.4 Abstract Data Types

Langdon, W. B. (1995c), "Evolving data structures using genetic programming," Research Note RN/95/1, UCL, Gower Street, London, WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/GPdata_icga-95.ps`

Langdon, W. B. (1995d), "Evolving data structures using genetic programming," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 295–302, Pittsburgh, PA, USA: Morgan Kaufmann.
`ftp://cs.ucl.ac.uk/genetic/papers/GPdata_icga-95.ps`

Langdon, W. B. (1995a), "Data structures and genetic programming," Research Note RN/95/70, University College London, Gower Street, London WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/WBL.aigp2.ch20.ps`

Langdon, W. B. (1996b), "Data structures and genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 20, Cambridge, MA, USA: MIT Press.
`ftp://cs.ucl.ac.uk/genetic/papers/WBL.aigp2.ch20.ps`

Langdon, W. B. (1996c), "Using data structures within genetic programming," Research Note RN/96/1, UCL, Gower Street, London, WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/WBL.gp96.ps`

B.5.4 Breeding Policies

B.5.4.1 Choosing Programs to Mate Using Geographic Closeness – Demes

Abbott, R. J. (1991), "Niches as a GA divide-and-conquer strategy," in *Proceedings of the Second Annual AI Symposium for the California State University*, A. Chapman and L. Myers (Eds.), California State University.

Tackett, W. A. and Carmi, A. (1994a), "The donut problem: Scalability and generalization in genetic programming," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 7, MIT Press.

Tackett, W. A. (1994b), *Recombination, Selection, and the Genetic Construction of Computer Programs*, PhD thesis, University of Southern California, Department of Electrical Engineering Systems.
`ftp://ftp.santafe.edu/pub/OLD/Users/tackett/phd`
`ftp://ftp.io.com/pub/genetic-programming/papers/watphd.tar.Z`

D'haeseleer, P. and Bluming, J. (1994), "Effects of locality in individual and population evolution," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 8, pp 177–198, MIT Press.

B.5.4.2 GP Running on Parallel Hardware

Koza, J. R. and Andre, D. (1995d), "Parallel genetic programming on a network of transputers," Technical Report CS-TR-95-1542, Stanford University, Department of Computer Science.
`ftp::/elib.stanford.edu/pub/reports/cs/tr/95/1542/`

Andre, D. and Koza, J. R. (1995), "Parallel genetic programming on a network of transputers," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 111–120.

Andre, D. and Koza, J. R. (1996), "Parallel genetic programming: A scalable implementation using the transputer network architecture," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 17, Cambridge, MA, USA: MIT Press.

Juille, H. and Pollack, J. B. (1995), "Parallel genetic programming and fine-grained SIMD architecture," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 31–37, MIT, Cambridge, MA, USA: AAAI.

Juille, H. and Pollack, J. B. (1996), "Massively parallel genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 17, Cambridge, MA, USA: MIT Press.
`ftp://ftp.cs.brandeis.edu/pub/faculty/pollack/gp2.ps.Z`

Vemuri, V. R. and Miller, P. (1995), "Evolving parallel SISAL programs using GP," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 120–121, MIT, Cambridge, MA, USA: AAAI.

B.5.4.3 Choosing Programs to Mate Using Program Behaviour or Fitness – Disassortive Mating

Ryan, C. (1994), "Pygmies and civil servants," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 11, MIT Press.
`ftp://odyssey.ucc.ie/pub/genetic/pygmy.tar.Z`

Reynolds, C. W. (1994d), "Evolution of obstacle avoidance behaviour:using noise to promote robust solutions," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 10, MIT Press.

Langdon, W. B. (1995e), "Pareto, population partitioning, price and genetic programming," Research Note RN/95/29, University College London, Gower Street, London WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/WBL_aaai-pppGP.ps`

B.5.4.4 Selecting at Birth Which Programs Enter the Breeding Population

Tackett, W. A. and Carmi, A. (1994b), "The unique implications of brood selection for genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, Orlando, Florida, USA: IEEE Press.

B.5.4.5 Seeding the Initial Population – Population Enrichment and Incremental Learning

Perry, J. E. (1994), "The effect of population enrichment in genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 456–461, Orlando, Florida, USA: IEEE Press.

Brock, O. (1994), "Evolving reusable subroutines for genetic programming," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 11–19, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Schmidhuber, J. (1995), "Beyond "genetic programming": Incremental self-improvement," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 42–49.
`http://www.idsia.ch/%7Ejuergen/`

Seront, G. (1995), "External concepts reuse in genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 94–98, MIT, Cambridge, MA, USA: AAAI.

B.5.5 Indexed Memory or Genetic Programs that Explicitly Use Memory

Teller, A. (1993), "Learning mental models," in *Proceedings of the Fifth Workshop on Neural Networks: An International Conference on Computational Intelligence: Neural Networks, Fuzzy Systems, Evolutionary Programming, and Virtual Reality*.
`ftp://GS61.SP.CS.CMU.EDU/afs/cs/usr/astro/public/papers/LearnModels.ps.Z`

Teller, A. (1994a), "The evolution of mental models," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 9, pp 199–219, MIT Press.
`ftp://GS61.SP.CS.CMU.EDU/afs/cs/usr/astro/public/papers/MentalModels.ps.Z`

Teller, A. (1994b), "Genetic programming, indexed memory, the halting problem, and other curiosities," in *Proceedings of the 7th annual Florida Artificial Intelligence Research Symposium, Pensacola, Florida, USA*, IEEE Press.
`ftp://ftp.io.com/pub/genetic-programming/papers/Curiosities.ps`
`ftp://GS61.SP.CS.CMU.EDU/afs/cs/usr/astro/public/papers/Curiosities.ps.Z`

Teller, A. (1994c), "Turing completeness in the language of genetic programming with indexed memory," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, Orlando, Florida, USA: IEEE Press.
`ftp://GS61.SP.CS.CMU.EDU/afs/cs/usr/astro/public/papers/Turing.ps.Z`

Jannink, J. (1994), "Cracking and co-evolving randomizers," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 20, pp 425–443, MIT Press.

Andre, D. (1994a), "Automatically defined features: The simultaneous evolution of 2-dimensional feature detectors and an algorithm for using them," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 23, MIT Press.

Andre, D. (1994b), "Evolution of mapmaking ability: Strategies for the evolution of learning, planning, and memory using genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, pp 250–255, Orlando, Florida, USA: IEEE Press.

Andre, D. (1995b), "The evolution of agents that build mental models and create simple plans using genetic programming," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 248–255, Pittsburgh, PA, USA: Morgan Kaufmann.

Andre, D. (1995a), "The automatic programming of agents that learn mental models and create simple plans of action," in *IJCAI-95 Proceedings of the Fourteenth International Joint Conference on Artificial Intelligence*, volume 1, pp 741–747, Montreal, Quebec, Canada: Morgan Kaufmann.

Brave, S. (1995a), "Using genetic programming to evolve mental models," in *Fourth Golden West Conference on Intelligent Systems*, S. Louis (Ed.), pp 91–96, International Society for Computers and their Applications - ISCA.

Krein, T. (1994), "Simple memory models and the concept of self in the game of concentration," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 77–86, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Littman, M. L. (1994), "Memoryless policies: Theoretical limitations and practical results," in *Simulation of Adaptive Behaviour (SAB-94)*, pp 238–245. [1]

B.5.6 Recursive and Iterative Genetic Programs

Brave, S. (1994), "Evolution of planning: Using recursive techniques in genetic planning," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 1–10, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Brave, S. (1995b), "Using genetic programming to evolve recursive programs for tree search," in *Fourth Golden West Conference on Intelligent Systems*, S. Louis (Ed.), pp 60–65, International Society for Computers and their Applications - ISCA.

Brave, S. (1996), "Evolving recursive programs for tree search," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 10, Cambridge, MA, USA: MIT Press.

Wong, M. L. and Leung, K. S. (1996), "Evolving recursive functions for the even-parity problem using genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 11, Cambridge, MA, USA: MIT Press.

B.5.7 Fitness Evaluation

B.5.7.1 Fitness Depending Upon Other Individuals (in the Same or Different Populations, Co-Evolution)

Hillis, W. D. (1992), "Co-evolving parasites improve simulated evolution as an optimization procedure," in *Artificial Life II*, C. G. Langton, C. Taylor, J. D. Farmer, and S. Rasmussen (Eds.), volume X of *Sante Fe Institute Studies in the Sciences of Complexity*, Addison-Wesley. [1]

Koza, J. R. (1991e), "Genetic evolution and co-evolution of computer programs," in *Artificial Life II*, C. T. C. Langton, J. D. Farmer, and S. Rasmussen (Eds.), volume X of *SFI Studies in the Sciences of Complexity*, pp 603–629, Redwood City, CA, USA: Addison-Wesley.

Angeline, P. J. and Pollack, J. B. (1993a), "Coevolving high-level representations.," July Technical report 92-PA-COEVOLVE, Laboratory for Artificial Intelligence. The Ohio State University.

Angeline, P. J. and Pollack, J. B. (1994), "Coevolving high-level representations," in *Artificial Life III*, C. G. Langton (Ed.), volume XVII of *SFI Studies in the Sciences of Complexity*, pp 55–71, Addison-Wesley.

Angeline, P. J. and Pollack, J. B. (1993b), "Competitive environments evolve better solutions for complex tasks," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, pp 264–270, Morgan Kaufmann.

Reynolds, C. W. (1994a), "Competition, coevolution and the game of tag," in *Proceedings of the Fourth International Workshop on the Synthesis and Simulation of Living Systems*, R. A. Brooks and P. Maes (Eds.), pp 59–69, MIT, Cambridge, MA, USA: MIT Press.
`ftp://ftp.io.com/pub/genetic-programming/papers/cwrALifeIV.ps.Z`

Siegel, E. V. (1994), "Competitively evolving decision trees against fixed training cases for natural language processing," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 19, MIT Press.

Ryan, C. (1995), "GPRobots and GPTeams - competition, co-evolution and co-operation in genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 86–93, MIT, Cambridge, MA, USA: AAAI.
`ftp://odyssey.ucc.ie/pub/genetic/robots.ps.Z`

Fukunaga, A. S. and Kahng, A. B. (1995), "Improving the performance of evolutionary optimization by dynamically scaling the evolution function," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.5.7.2 Online Fitness as Testing Continues

Maxwell III, S. R. (1994), "Experiments with a coroutine model for genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence, Orlando, Florida, USA*, volume 1, pp 413–417a, Orlando, Florida, USA: IEEE Press.

B.5.7.3 How Good are Programs Evolved With Limited Tests on the General Problem?

Kinnear, Jr., K. E. (1993), "Evolving a sort: Lessons in genetic programming," in *Proceedings of the 1993 International Conference on Neural Networks*, volume 2, IEEE Press.
`ftp://ftp.io.com/pub/genetic-programming/papers/kinnear.icnn93.ps.Z`

Kinnear Jr., K. E. (1993), "Generality and difficulty in genetic programming: Evolving a sort," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, pp 287–294, Morgan Kaufmann.
`ftp://ftp/io.com/pub/genetic-programming/kinnear.icga93.ps.Z`

Reynolds, C. W. (1994c), "Evolution of corridor following behavior in a noisy world," in *Simulation of Adaptive Behaviour (SAB-94)*.
`ftp://ftp.io.com/pub/genetic-programming/papers/cwrSAB94.ps.Z`

Lee, J. Y. B. and Wong, P. C. (1995), "The effect of function noise on GP efficiency," in *Progress in Evolutionary Computation*, X. Yao (Ed.), volume 956 of *Lecture Notes in Artificial Intelligence*, pp 1–16, Heidelberg, Germany: Springer-Verlag.

B.5.7.4 Evaluation Efficiency

Handley, S. (1994b), "On the use of a directed acyclic graph to represent a population of computer programs," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 154–159, Orlando, Florida, USA: IEEE Press.
`http://www-leland.stanford.edu/~shandley/postscript/caching_paper___first_draft.ps.gz`

Gathercole, C. and Ross, P. (1994), "Dynamic training subset selection for supervised learning in genetic programming," in *Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 312–321, Jerusalem: Springer-Verlag.

Keijzer, M. (1996), "Efficiently representing populations in genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 13, Cambridge, MA, USA: MIT Press.

Siegel, E. V. and Chaffee, A. D. (1996), "Genetically optimizing the speed of programs evolved to play tetris," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 14, Cambridge, MA, USA: MIT Press.

B.5.8 Genetic Operators

B.5.8.1 Targeting Crossover Points to Minimise Disruption

D'haeseleer, P. (1994), "Context preserving crossover in genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, pp 256–261, Orlando, Florida, USA: IEEE Press.
`ftp://ftp.io.com/pub/genetic-programming/papers/WCCI94_CPC.ps.Z`

B.5.8.2 Hill Climbing and Simulated Annealing

Sharman, K. C. and Esparcia-Alcazar, A. I. (1993), "Genetic evolution of symbolic signal models," in *Proceedings of the Second International Conference on Natural Algorithms in Signal Processing, NASP'93*.
`http://rank-serv.elec.gla.ac.uk/~anna/natalg93.ps`

O'Reilly, U.-M. and Oppacher, F. (1994a), "Program search with a hierarchical variable length representation: Genetic programming, simulated annealing and hill climbing," Technical Report 94-04-021, Santa Fe Institute, 1399 Hyde Park Road Santa Fe, New Mexico 87501-8943 USA.

O'Reilly, U.-M. and Oppacher, F. (1994b), "Program search with a hierarchical variable length representation: Genetic programming, simulated annealing and hill climbing," in *Parallel Problem Solving from Nature – PPSN III*, Y. Davidor, H.-P. Schwefel, and R. Manner (Eds.), number 866 in Lecture Notes in Computer Science, pp 397–406, Jerusalem: Springer-Verlag.

O'Reilly, U.-M. and Oppacher, F. (1995a), "Hybridized crossover-based search techniques for program discovery," Technical Report 95-02-007, Santa Fe Institute, 1399 Hyde Park Road Santa Fe, New Mexico 87501-8943 USA.
`http://www.santafe.edu/~unamay/xo-hybrid.ps`

O'Reilly, U.-M. and Oppacher, F. (1995b), "Hybridized crossover-based search techniques for program discovery," in *Proceedings of the 1995 World Conference on Evolutionary Computation*.
`http://www.santafe.edu/~unamay/ec95.ps`

O'Reilly, U.-M. (1995), *An Analysis of Genetic Programming*, PhD thesis, Carelton University, Ottawa-Carleton Institute for Computer Science, Ottawa, Ontario, Canada.
`ftp://ftp.santafe.edu/pub/unamay/`
`ftp://cs.ucl.ac.uk/genetic/papers/oreilly/`

O'Reilly, U.-M. and Oppacher, F. (1996), "A comparative analysis of GP," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 2, Cambridge, MA, USA: MIT Press.

Iba, H. and Sato, T. (1994), "Genetic programming with local hill-climbing," Technical Report ETL-TR-94-4, Electrotechnical Laboratory, 1-1-4 Umezono, Tsukuba-city, Ibaraki, 305, Japan.

Iba, H., de Garis, H., and Sato, T. (1994b), "Genetic programming with local hill-climbing," in *Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 334–343, Jerusalem: Springer-Verlag.

Tackett, W. A. (1994a), "Greedy recombination and genetic search on the space of computer programs," in *Foundations of Genetic Algorithms 3*, D. Whitley and M. Vose (Eds.), Morgan Kaufmann.

B.5.9 GP Theory

B.5.9.1 Analyzing the GP Search Space as a Fitness Landscape

Kinnear, Jr., K. E. (1994c), "Fitness landscapes and difficulty in genetic programming," in *Proceedings of the 1994 IEEE World Conference on Computational Intelligence*, volume 1, pp 142–147, Orlando, Florida, USA: IEEE Press.
`ftp://ftp.io.com/pub/genetic-programming/papers/kinnear.wcci.ps.Z`

B.5.9.2 Analyzing GP Populations in Terms of Information Theory Entropy

Rosca, J. P. (1995c), "Entropy-driven adaptive representation," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 23–32.

B.5.9.3 GP Schema Theorem and Building Block Hypothesis

O'Reilly, U.-M. and Oppacher, F. (1992a), "An experimental perspective on genetic programming," in *Parallel Problem Solving from Nature 2*, R. Manner and B. Manderick (Eds.), pp 331–340, Brussels, Belgium: Elsevier Science.
`http://www.santafe.edu/~unamay/ppsn92.ps`

O'Reilly, U. M. and Oppacher, F. (1992b), "The troubling aspects of a building block hypothesis for genetic programming," Working Paper 94-02-001, Santa Fe Institute, 1399 Hyde Park Road Santa Fe, New Mexico 87501-8943 USA.

O'Reilly, U.-M. and Oppacher, F. (1995c), "The troubling aspects of a building block hypothesis for genetic programming," in *Proceedings of the Third Workshop on the Foundations of Genetic Algorithms*, D. Whitley and M. D. Vose (Eds.), pp 73–88, Morgan Kaufmann.

O'Reilly, U.-M. and Oppacher, F. (1994c), "Using building block functions to investigate a building block hypothesis for genetic programming," Working Paper 94-02-029, Santa Fe Institute, 1399 Hyde Park Road Santa Fe, New Mexico 87501-8943 USA.

Whigham, P. A. (1995d), "A schema theorem for context-free grammars," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

Punch, W. F., Zongker, D., and Goodman, E. D. (1996), "The royal tree problem, a benchmark for single and multiple population genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 15, Cambridge, MA, USA: MIT Press.

Altenberg, L. (1995b), "The Schema Theorem and Price's Theorem," in *Foundations of Genetic Algorithms 3*, D. Whitley and M. D. Vose (Eds.), pp 23–49, San Mateo, CA, USA: Morgan Kaufmann.
`ftp://ftp.mhpcc.edu/pub/incoming/altenberg/LeeSTPT.ps.Z`

Gathercole, C. and Ross, P. (1995), "The MAX problem for genetic programming - highlighting an adverse interaction between the crossover operator and a restriction on tree depth," Technical report, Department of Artificial Intelligence, University of Edinburgh, 80 South Bridge, Edinburgh, EH1 1HN, UK.
`ftp://ftp.dai.ed.ac.uk:/pub/user/chrisg/max-problem-in-GP.for_submission_to_gp-96.ps.gz`

B.5.9.4 Evolvability of GP Populations

Altenberg, L. (1994b), "The evolution of evolvability in genetic programming," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), MIT Press.
`ftp://ftp.mhpcc.edu/pub/incoming/altenberg/LeeEEGP.ps`

Altenberg, L. (1994c), "Evolving better representations through selective genome growth," in *Proceedings of the 1st IEEE Conference on Evolutionary Computation*, volume 1, pp 182–187, Orlando, Florida, USA: IEEE.
`ftp://ftp.mhpcc.edu/pub/incoming/altenberg/LeeEBR.ps.Z`

Altenberg, L. (1994a), "Emergent phenomena in genetic programming," in *Evolutionary Programming — Proceedings of the Third Annual Conference*, A. V. Sebald and L. J. Fogel (Eds.), pp 233–241, World Scientific Publishing.
`ftp://ftp.mhpcc.edu/pub/incoming/altenberg/LeeEEGP.ps.Z`

Altenberg, L. (1995a), "Genome growth and the evolution of the genotype-phenotype map," in *Evolution as a Computational Process*, W. Banzhaf and F. H. Eeckman (Eds.), pp 205–259, Berlin, Germany: Springer-Verlag.
`ftp://ftp.mhpcc.edu/pub/incoming/altenberg/LeeGGEGPM.ps.Z`

B.5.9.5 Evolution of Program Size and Non-Functional Code (Introns)

Blickle, T. and Thiele, L. (1994), "Genetic programming and redundancy," in *Genetic Algorithms within the Framework of Evolutionary Computation (Workshop at KI-94, Saarbrücken)*, J. Hopf (Ed.), pp 33–38, Im Stadtwald, Building 44, D-66123 Saarbrücken, Germany: Max-Planck-Institut für Informatik (MPI-I-94-241).
`http://www.tik.ee.ethz.ch/~blickle/GPandRedundancy.ps.Z`

Blickle, T. and Thiele, L. (1995), "A comparison of selection schemes used in genetic algorithms," TIK-Report 11, TIK Institut fur Technische Informatik und Kommunikationsnetze, Computer Engineering and Networks Laboratory, ETH, Swiss Federal Institute of Technology, Gloriastrasse 35, 8092 Zurich, Switzerland.

Wineberg, M. and Oppacher, F. (1994), "A representation scheme to perform program induction in a canonical genetic algorithm," in *Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 292–301, Jerusalem: Springer-Verlag.

Rhodes, B. (1994), "The evolution of resistance to crossover and mutation in GP," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 156–162, Stanford, California, 94305-3079 USA: Stanford Bookstore.

McPhee, N. F. and Miller, J. D. (1995), "Accurate replication in genetic programming," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 303–309, Pittsburgh, PA, USA: Morgan Kaufmann.

Nordin, P. and Banzhaf, W. (1995a), "Complexity compression and evolution," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 310–317, Pittsburgh, PA, USA: Morgan Kaufmann.
`ftp://lumpi.informatik.uni-dortmund.de/pub/biocomp/icga95-2.ps.gz`

Nordin, P., Francone, F., and Banzhaf, W. (1995), "Explicitly defined introns and destructive crossover in genetic programming," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 6–22.
`ftp://lumpi.informatik.uni-dortmund.de/pub/biocomp/ML95.ps.gz`

Nordin, P., Francone, F., and Banzhaf, W. (1996), "Explicitly defined introns and destructive crossover in genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 6, Cambridge, MA, USA: MIT Press.

B.5.9.6 Statistical Approaches to Fitness Distributions within GP Populations

Keenan, N. (1993), "Statistical investigations of genetic algorithms and genetic programming," Notes from Genetic Programming Workshop at ICGA-93.
`ftp://ftp.io.com/pub/genetic-programming/papers/ICGA-93-GP-Abstracts.ps.Z`

B.6 GP Development Systems

Singleton, A. (1994), "Genetic programming with C++," *BYTE*, pp 171–176.

Singleton, A. (1993), "Meta GA, desktop supercomputing and object-orientated GP," Notes from Genetic Programming Workshop at ICGA-93.
`ftp://ftp.io.com/pub/genetic-programming/papers/ICGA-93-GP-Abstracts.ps.Z`

Keith, M. J. and Martin, M. C. (1994), "Genetic programming in C++: Implementation issues," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 13, MIT Press.
`http://www.frc.ri.cmu.edu/~mcm/chapt.html`

Tebbe, C., Hampo, R. J., Bryant, B. D., and Marko, K. A., "Genetic programming toolkit," Ford Proprietary.

Cona, J. (1995), "Developing a genetic programming system," *AI Expert*, pp 20–29.

Harris, C. and Buxton, B. (1996b), "GP-COM: A distributed, component-based genetic programming system in C++," Research Note RN/96/2, UCL, Gower Street, London, WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/gpcom.ps`

B.7 GP Applications

B.7.1 Prediction and Classification

Koza, J. R. (1991a), "Concept formation and decision tree induction using the genetic programming paradigm," in *Parallel Problem Solving from Nature - Proceedings of 1st Workshop, PPSN 1*, H.-P. Schwefel and R. Männer (Eds.), volume 496 of *Lecture Notes in Computer Science*, pp 124–128, Dortmund, Germany: Springer-Verlag.

Jiang, M. (1992), *A hierarchical genetic system for symbolic function identification*, PhD thesis, University of Montana.

Jiang, M. and Wright, A. H. (1992), "A hierarchical genetic system for symbolic function identification," in *Proceedings of the 24th Symposium on the Interface: Computing Science and Statistics, College Station, Texas*.

Jiang, M. (1993), "An adaptive function identification system," in *Proceedings of the IEEE/ACM Conference on Developing and Managing Intelligent System Projects, Vienna, Virginia, USA*.

Oakley, E. H. N. (1993), "Signal filtering and data processing for laser rheometry," Technical report, Institute of Naval Medicine, Portsmouth, UK.

Oakley, H. (1994b), "Two scientific applications of genetic programming: Stack filters and non-linear equation fitting to chaotic data," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 17, MIT Press.

Oakley, E. H. N. (1994a), "The application of genetic programming to the investigation of short, noisy, chaotic data series," in *Evolutionary Computing*, T. C. Fogarty (Ed.), Lecture Notes in Computer Science, Leeds, UK: Springer-Verlag.
`http://www.io.com/~ftp/genetic-programming/papers/OAKPAPRS.TARR.GZ`

Oakley, E. H. N. (1995), "Genetic programming as a means of assessing and reflecting chaos," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 68–72, MIT, Cambridge, MA, USA: AAAI.
`http://www.io.com/~ftp/genetic-programming/papers/OAKPAPRS.TARR.GZ`

Iba, H., de Garis, H., and Sato, T. (1993b), "Solving identification problems by structured genetic algorithms," Technical report ETL-TR-93-17, Electrotechnical Laboratory, 1-1-4 Umezono, Tsukuba-city, Ibaraki, 305, Japan.

Masand, B. (1994), "Optimising confidence of text classification by evolution of symbolic expressions," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 21, MIT Press.

Masand, B. and Piatesky-Shapiro, G. (1996), "Discovering time oriented abstractions in historical data to optimize decision tree classification," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 24, Cambridge, MA, USA: MIT Press.

Tackett, W. A. (1995), "Mining the genetic program," *IEEE Expert*, 10(3):28–38.

Sebag, M., Maitournam, H., and Schoenauer, M. (1995), "Identification of mechanical behaviour by genetic programming part I: Rheological formulation," Technical report, Ecole Polytechnique, 91128 Palaiseau, France.

Schoenauer, M., Lamy, B., and Jouve, F. (1995), "Identification of mechanical behaviour by genetic programming part II: Energy formulation," Technical report, Ecole Polytechnique, 91128 Palaiseau, France.

Schoenauer, M., Sebag, M., Jouve, F., Lamy, B., and Maitournam, H. (1996), "Evolutionary identification of macro-mechanical models," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 23, Cambridge, MA, USA: MIT Press.

B.7.2 Modeling

Openshaw, S. and Turton, I. (1994), "Building new spatial interaction models using genetic programming," in *Evolutionary Computing*, T. C. Fogarty (Ed.), Lecture Notes in Computer Science, Leeds, UK: Springer-Verlag.
`http://gam.leeds.ac.uk/staff/i.turton/ai/aisb.ps`

Babovic, V. and Minns, A. W. (1994), "Use of computational adaptive methodologies in hydroinformatics," in *Proceedings of the first international conference on hydroinformatics, Delft, Netherlands*, A. Verwey, A. W. Minns, V. Babovic, and C. Maksimovic (Eds.), pp 201–210, A. A. Balkema.

Babovic, V. (1995), "Genetic model induction based on experimental data," in *Proceedings of the XXVIth Congress of International Association for Hydraulics Research*.

Bettenhausen, K. D., Gehlen, S., Marenbach, P., and Tolle, H. (1995a), "BioX++ – New results and conceptions concerning the intelligent control of biotechnological processes," in *6th International Conference on Computer Applications in Biotechnology*, A. Munack and K. Schügerl (Eds.), pp 324–327, Elsevier Science.
`http://www.rt.e-technik.th-darmstadt.de/LIT/rst_03_95.ps.gz`

Bettenhausen, K. D. and Marenbach, P. (1995), "Self-organizing modeling of biotechnological batch and fed-batch fermentations," in *EUROSIM'95*, F. Breitenecker and I. Husinsky (Eds.), Elsevier.
`http://www.rt.e-technik.th-darmstadt.de/~mali/GP/wien.ps.gz`

Bettenhausen, K. D., Marenbach, P., Freyer, S., Rettenmaier, H., and Nieken, U. (1995b), "Self-organizing structured modeling of a biotechnological fed-batch fermentation by means of genetic programming," in *First International Conference on Genetic Algorithms in Engineering Systems: Innovations and Applications, GALESIA*, A. M. S. Zalzala (Ed.), volume 414, pp 481–486, Sheffield, UK: IEE.
`http://www.rt.e-technik.th-darmstadt.de/~mali/GP/sheffield.ps.gz`

Marenbach, P., Bettenhausen, K. D., and Cuno, B. (1995), "Selbstorganisierende Generierung strukturierter Prozemodelle," *at – Automatisierungstechnik*, 43(6):277–288.

Marenbach, P. (1995), "Status und Perspektiven der strukturierten Modellbildung mit Hilfe Genetischer Algorithmen," Technical report, FG Regelsystemtheorie & Robotik, TH Darmstadt, Landgraf-Georg-Str. 4, D-64283 Darmstadt, Germany.

Howard, L. M. and D'Angelo, D. J. (1995), "The GA–P: A genetic algorithm and genetic programming hybrid," *IEEE Expert*, 10(3):11–15.

B.7.3 Image and Signal Processing

Hampo, R. J. and Marko, K. A. (1992), "Application of genetic programming to control of vehicle systems," in *Proceedings of the Intelligent Vehicles '92 Symposium*, June 29 - July 1, 1992, Detroit, Mi, USA.

Hampo, R. J., Bryant, B. D., and Marko, K. A. (1994), "IC engine misfire detection algorithm generation using genetic programming," in *EUFIT'94*, pp 1674–1678, Promenade 9, D-52076, Aachen, Germany: ELITE-Foundation.
`ftp://ftp.io.com/pub/genetic-programming/papers/misfire-detection.PS.Z`

Tackett, W. A. (1993b), "Genetic programming for feature discovery and image discrimination," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, Morgan Kaufmann.

Tackett, W. A. (1993a), "Genetic generation of "dendritic" trees for image classification," in *Proceedings of WCNN93*, pp IV 646–649, IEEE Press.

Andre, D. (1994c), "Learning and upgrading rules for an OCR system using genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, Orlando, Florida, USA: IEEE Press.

Teller, A. and Veloso, M. (1995d), "PADO: Learning tree structured algorithms for orchestration into an object recognition system," Technical Report CMU-CS-95-101, Department of Computer Science, Carnegie Mellon University, Pittsburgh, PA, USA.
`ftp://GS61.SP.CS.CMU.EDU/afs/cs/usr/astro/public/papers/PADOTechReport.ps.Z`

Teller, A. and Veloso, M. (1995e), "Program evolution for data mining," *The International Journal of Expert Systems*, 8(3).
`http://www.cs.cmu.edu/afs/cs/usr/astro/public/papers/Astro-ESJ.ps.Z`

Teller, A. and Veloso, M. (1995c), "PADO: A new learning architecture for object recognition," in *Symbolic Visual Learning*, K. Ikeuchi and M. Veloso (Eds.), Oxford University Press.
`http://www.cs.cmu.edu/afs/cs/usr/astro/public/papers/PADO.ps.Z`

Teller, A. and Veloso, M. (1995b), "A controlled experiment: Evolution for learning difficult image classification," in *Seventh Portuguese Conference On Artificial Intelligence*, Springer-Verlag.
`http://www.cs.cmu.edu/afs/cs/usr/astro/public/papers/TellerVelosoEPIA.ps.Z`

Teller, A. and Veloso, M. (1995a), "Algorithm evolution for face recognition: What makes a picture difficult," in *International Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.
`http://www.cs.cmu.edu/afs/cs/usr/astro/public/papers/icecFinal.ps`

Johnson, M. P., Maes, P., and Darrell, T. (1994), "Evolving visual routines," in *ARTIFICIAL LIFE IV, Proceedings of the fourth International Workshop on the Synthesis and Simulation of Living Systems*, R. A. Brooks and P. Maes (Eds.), pp 198–209, MIT, Cambridge, MA, USA: MIT Press.
`ftp://media.mit.edu/pub/agents/autonomous-agents/alife-iv.ps.Z`

Gordon, B. M. (1994), "Exploring the underlying structure of natural images through genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 49–56, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Robinson, G. and McIlroy, P. (1995a), "Exploring some commercial applications of genetic programming," Project 4487, British Telecom, Systems Research Division, Martelsham, Ipswitch, UK.

Robinson, G. and McIlroy, P. (1995b), "Exploring some commercial applications of genetic programming," in *Evolutionary Computing*, T. C. Fogarty (Ed.), number 993 in Lecture Notes in Computer Science, Sheffield, UK: Springer-Verlag.

Crosbie, M. and Spafford, E. H. (1995), "Applying genetic programming to intrusion detection," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 1–8, MIT, Cambridge, MA, USA: AAAI.

Daida, J. M., Hommes, J. D., Ross, S. J., and Vesecky, J. F. (1995), "Extracting curvilinear features from SAR images of arctic ice: Algorithm discovery using the genetic programming paradigm," in *Proceedings of IEEE International Geoscience and Remote Sensing, Florence, It*.

Daida, J. M., Hommes, J. D., Bersano-Begey, T. F., Ross, S. J., and Vesecky, J. F. (1996), "Algorithm discovery using the genetic programming paradigm: Extracting low-contrast curvilinear features from SAR images of arctic ice," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 21, Cambridge, MA, USA: MIT Press.

Riolo, R. L. and Line, M. P. (1995), "Automatic discovery of classification and estimation algorithms for earth-observation satellite imagery," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 73–77, MIT, Cambridge, MA, USA: AAAI.

Sharman, K. C., Esparcia Alcazar, A. I., and Li, Y. (1995), "Evolving signal processing algorithms by genetic programming," in *First International Conference on Genetic Algorithms in Engineering Systems: Innovations and Applications, GALESIA*, A. M. S. Zalzala (Ed.), volume 414, pp 473–480, Sheffield, UK: IEE.
`http://rank-serv.elec.gla.ac.uk/~anna/galesi95.ps`

Harris, C. and Buxton, B. (1996a), "Evolving edge detectors," Research Note RN/96/3, UCL, Gower Street, London, WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/edgegp.ps`

B.7.4 Optimisation of Designs

Nguyen, T. C., Goldberg, D. S., and Huang, T. S. (1993), "Evolvable modeling: structural adaptation through hierarchical evolution for 3-D model-based vision," Technical report, Beckman Institute and Coordinated Science Laboratory, University of Illinois, Urbana, IL 61801, USA.
`ftp://ftp.io.com/pub/genetic-programming/papers/gp-3D-modeling.ps.Z`

Nguyen, T. and Huang, T. (1994), "Evolvable 3D modeling for model-based object recognition systems," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 22, pp 459–475, MIT Press.

Coon, B. W. (1994), "Circuit synthesis through genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 11–20, Stanford, California, 94305-3079 USA: Stanford Bookstore.

B.7.5 Database

Kraft, D. H., Petry, F. E., Buckles, W. P., and Sadasivan, T. (1994), "The use of genetic programming to build queries for information retrieval," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 468–473, Orlando, Florida, USA: IEEE Press.

Morrison, D. (1994), "Development of a prototype intelligent browsing system, utilising boolean query generation using genetic programming," Master's thesis, University College, London, Gower Street, London, WC1E 6BT, UK.

Teller, A. (1995a), "The discovery of algorithms for automatic database retrieval," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 76–88.

B.7.6 Financial Trading, Time Series Prediction and Economic Modeling

Koza, J. R. (1990b), "A genetic approach to econometric modeling," in *Sixth World Congress of the Econometric Society*.

Koza, J. R. (1991d), "A genetic approach to econometric modeling," in *Economics and Cognitive Science*, P. Bourgine and B. Walliser (Eds.), pp 57–75, Oxford, UK: Pergamon Press.

Andrews, M. and Prager, R. (1994), "Genetic programming for the acquisition of double auction market strategies," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 16, pp 355–368, MIT Press.

Tufts, P. (1995b), "Parallel case evaluation for genetic programming," in *1993 Lectures in Complex Systems*, D. L. Stein and L. Nadel (Eds.), volume X of *Santa Fe Institute Studies in the Science of Complexity*, Addison-Wesley.

Iba, H., de Garis, H., and Sato, T. (1995b), "Temporal data processing using genetic programming," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 279–286, Pittsburgh, PA, USA: Morgan Kaufmann.

Chen, S.-H. and Yeh, C.-H. (1996), "Genetic programming learning and the cobweb model," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 22, Cambridge, MA, USA: MIT Press.

Lee, G. Y. (1995), "Explicit models for chaotic and noisy time series through the genetic recursive regression,"

Eglit, J. T. (1994), "Trend prediction in financial time series," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 31–40, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Lent, B. (1994), "Evolution of trade strategies using genetic algorithms and genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 87–98, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Powers, R. (1994), "A study on the emergence of trade in artificial organisms," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 146–155, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Spitz, S. (1994a), "Distributed genetic programming for on-line prediction in changing environments," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 150–159, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Warren, M. A. (1994), "Stock price prediction using genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 180–184, Stanford, California, 94305-3079 USA: Stanford Bookstore.

B.7.7 Robots and Autonomous Agents

Koza, J. R. (1991b), "Evolution and co-evolution of computer programs to control independent-acting agents," in *From Animals to Animats: Proceedings of the First International Conference on Simulation of Adaptive Behavior, 24-28, September 1990*, J.-A. Meyer and S. W. Wilson (Eds.), pp 366–375, Paris, France: MIT Press.

Koza, J. R. and Rice, J. P. (1992a), "Automatic programming of robots using genetic programming," in *Proceedings of Tenth National Conference on Artificial Intelligence*, pp 194–201, AAAI Press/MIT Press.

Koza, J. R. (1992a), "Evolution of subsumption using genetic programming," in *Proceedings of the First European Conference on Artificial Life. Towards a Practice of Autonomous Systems*, F. J. Varela and P. Bourgine (Eds.), pp 110–119, Paris, France: MIT Press.

Koza, J. R. (1994e), "Evolution of a subsumption architecture that performs a wall following task for an autonomous mobile robot via genetic programming," in *Computational Learning Theory and Natural Learning Systems*, T. Petsche (Ed.), volume 2, pp 321–346, Cambridge, MA, USA: MIT Press.

Handley, S. (1991), "The automatic generation of plans for a mobile robot via genetic programming with automatically defined functions," in *Proceedings of the Fifth Workshop on Neural Networks: An International Conference on Computational Intelligence: Neural Networks, Fuzzy Systems, Evolutionary Programming, and Virtual Reality*.

Handley, S. (1993b), "The genetic planner: The automatic generation of plans for a mobile robot via genetic programming," in *Proceedings of the Eighth IEEE International Symposium on Intelligent Control*.

Handley, S. G. (1994c), "The automatic generations of plans for a mobile robot via genetic programming with automatically defined functions," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 18, pp 391–407, MIT Press.
`http://www-leland.stanford.edu/~shandley/postscript/kinnear.ps.gz`

Spencer, G. F. (1993), "Automatic generation of programs for crawling and walking," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, p 654, Morgan Kaufmann.

Spencer, G. F. (1994), "Automatic generation of programs for crawling and walking," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 15, pp 335–353, MIT Press.

Atkin, M. and Cohen, P. R. (1993a), "Genetic programming to learn an agent's monitoring strategy," in *Proceedings of the AAAI-93 Workshop on Learning Action Models*, AAAI Press.

Atkin, M. and Cohen, P. R. (1993b), "Genetic programming to learn an agent's monitoring strategy," Technical report TR-93-26, Computer Science Department, University of Massachusetts, Amherst, MA, USA.

Atkin, M. S. and Cohen, P. R. (1994), "Learning monitoring strategies: A difficult genetic programming application," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 328–332a, Orlando, Florida, USA: IEEE Press.

Fraser, A. P. and Rush, J. R. (1994), "Putting INK into a BIRo: A discussion of problem domain knowledge for evolutionary robotics," in *Evolutionary Computing*, T. C. Fogarty (Ed.), Lecture Notes in Computer Science, Leeds, UK: Springer-Verlag.

Rush, J. R., Fraser, A. P., and P., B. D. (1994), "Evolving co-operation in autonomous robotic systems," in *Proceedings of the IEE International Conference on Control, March 21-24, 1994*.

Ghanea-Hercock, R. and Fraser, A. P. (1994), "Evolution of autonomous robot control architectures," in *Evolutionary Computing*, T. C. Fogarty (Ed.), Lecture Notes in Computer Science, Leeds, UK: Springer-Verlag.

Nordin, P. and Banzhaf, W. (1995c), "Genetic programming controlling a miniature robot," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 61–67, MIT, Cambridge, MA, USA: AAAI.

Lott, C. G. (1994), "Terrain flattening by autonomous robot: A genetic programming application," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 99–109, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Nakashima, H., Noda, I., and Ohsawa, I. (1995), "Organic programming for multi-agents," in *ICMAS-95 Proceedings First International Conference on Multi-Agent Systems*, V. Lesser (Ed.), p 459, San Francisco, California, USA: AAAI Press/MIT Press. [1]

Taylor, S. N. (1994b), "Evolution by genetic programming of a spatial robot juggling algorithm," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 160–169, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Taylor, S. N. (1995), "Evolution by genetic programming of a spatial robot juggling control algorithm," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 104–110.

Qureshi, A. (1996), "Evolving agents," Research Note RN/96/4, UCL, Gower Street, London, WC1E 6BT, UK.
`ftp://cs.ucl.ac.uk/genetic/papers/AQ.gp96.ps`

B.7.8 Planning

Spector, L. (1994), "Genetic programming and AI planning systems," in *Proceedings of Twelfth National Conference on Artificial Intelligence*, Seattle, Washington, USA: AAAI Press/MIT Press.

B.7.9 Control

Koza, J. R. and Keane, M. A. (1990a), "Cart centering and broom balancing by genetically breeding populations of control strategy programs," in *Proceedings of International Joint Conference on Neural Networks*, volume I, pp 198–201, Washington: Lawrence Erlbaum.

Koza, J. R. and Keane, M. A. (1990b), "Genetic breeding of non-linear optimal control strategies for broom balancing," in *Proceedings of the Ninth International Conference on Analysis and Optimization of Systems. 1990*, pp 47–56, Antibes, France: Springer-Verlag.

Koza, J. R. (1992b), "A genetic approach to finding a controller to back up a tractor-trailer truck," in *Proceedings of the 1992 American Control Conference*, volume III, pp 2307–2311, Evanston, IL, USA: American Automatic Control Council.

Koza, J. R. (1992c), "A genetic approach to the truck backer upper problem and the inter-twined spiral problem," in *Proceedings of IJCNN International Joint Conference on Neural Networks*, volume IV, pp 310–318, IEEE Press.

Keane, M. A., Koza, J. R., and Rice, J. P. (1993), "Finding an impulse response function using genetic programming," in *Proceedings of the 1993 American Control Conference*, volume III, pp 2345–2350.

Lay, M.-Y. (1994), "Application of genetic programming in analyzing multiple steady states of dynamical systems," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 333–336b, Orlando, Florida, USA: IEEE Press.

Dzeroski, S., Todorovski, L., and Petrovski, I. (1995), "Dynamical system identification with machine learning," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 50–63.

McKay, B., Willis, M. J., and Barton, G. W. (1995b), "Using a tree structured genetic algorithm to perform symbolic regression," in *First International Conference on Genetic Algorithms in Engineering Systems: Innovations and Applications, GALESIA*, A. M. S. Zalzala (Ed.), volume 414, pp 487–492, Sheffield, UK: IEE.

McKay, B., Willis, M. J., and Barton, G. W. (1995a), "On the application of genetic programming to chemical process systems," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.7.10 Computer Language Parsing

Dunay, B. D., Petry, F. E., and Buckles, W. P. (1994), "Regular language induction with genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 396–400, Orlando, Florida, USA: IEEE Press.

Dunay, B. D. and Petry, F. E. (1995), "Solving complex problems with genetic algorithms," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 264–270, Pittsburgh, PA, USA: Morgan Kaufmann.

Zomorodian, A. (1994), "Context-free language induction by evolution of deterministic push-down automata using genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 184–193, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Zomorodian, A. (1995), "Context-free language induction by evolution of deterministic push-down automata using genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 127–133, MIT, Cambridge, MA, USA: AAAI.

B.7.11 Medical

Handley, S. G. and Klingler, T. (1993), "Automated learning of a detector for a-helices in protein sequences via genetic programming," in *Artificial Life at Stanford 1993*, J. R. Koza (Ed.), Stanford, California, 94305-3079 USA: Stanford Bookstore.

Handley, S. (1993a), "Automatic learning of a detector for alpha-helices in protein sequences via genetic programming," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, pp 271–278, Morgan Kaufmann.
`http://www-leland.stanford.edu/~shandley/postscript/alpha-helices.ps.gz`

Handley, S. (1994a), "Automated learning of a detector for the cores of a-helices in protein sequences via genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, pp 474–479, Orlando, Florida, USA: IEEE Press.
`http://www-leland.stanford.edu/~shandley/postscript/helix_segments_paper.ps.gz`

Handley, S. G. (1994d), "The prediction of the degree of exposure to solvent of amino acid residues via genetic programming," in *Second International Conference on Intelligent Systems for Molecular Biology*, Stanford University, Stanford, CA, USA: AAAI Press.
`http://www-leland.stanford.edu/~shandley/postscript/pburied.ps.gz`

Handley, S. (1995b), "Predicting whether or not a 60-base DNA sequence contains a centrally-located splice site using genetic programming," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 98–103.
`http://www-leland.stanford.edu/~shandley/postscript/splicej.ps.gz`
`http://www-leland.stanford.edu/~shandley/postscript/ML95GPwkshp.ps.gz`

Handley, S. (1995a), "Classifying nucleic acid sub-sequences as introns or exons using genetic programming," in *Proceedings of the Third International Conference on Intelligent Systems for Molecular Biology (ISMB-95)*, C. Rawlins, D. Clark, R. Altman, L. Hunter, T. Lengauer, and S. Wodak (Eds.), pp 162–169, Cambridge, UK: AAAI Press.
`http://www-leland.stanford.edu/~shandley/postscript/iep-ISMB.ps.gz`

Handley, S. (1995d), "Predicting whether or not a nucleic acid sequence is an E. coli promoter region using genetic programming," in *Proceedings of the First International Symposium on Intelligence in Neural and Biological Systems INBS-95*, pp 122–127, Herndon, Virginia, USA: IEEE Computer Society Press.
`http://www-leland.stanford.edu/~shandley/postscript/postscript/INBS-camera-ready.ps.gz`

Handley, S. (1995c), "Predicting whether or not a 60-base DNA sequence contains a centrally-located splice site using genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 17–22, MIT, Cambridge, MA, USA: AAAI.

Koza, J. R. (1994l), "Recognizing patterns in protein sequences using iteration-performing calculations in genetic programming," in *1994 IEEE World Congress on Computational Intelligence*, Orlando, Florida, USA: IEEE Press.

Koza, J. R. (1994c), "Automated discovery of detectors and iteration-performing calculations to recognize patterns in protein sequences using genetic programming," in *Proceedings of the Conference on Computer Vision and Pattern Recognition*, pp 684–689, IEEE Computer Society Press.

Koza, J. R. (1994d), "Evolution of a computer program for classifying protein segments as transmembrane domains using genetic programming," in *Proceedings of the Second International Conference on Intelligent Systems for Molecular Biology*, R. Altman, D. Brutlag, P. Karp, R. Lathrop, and D. Searls (Eds.), pp 244–252, AAAI Press.

Koza, J. R. and Andre, D. (1995b), "Automatic discovery using genetic programming of an unknown-sized detector of protein motifs containing repeatedly-used subexpressions," in *Proceedings of the Workshop on Genetic Programming: From Theory to Real-World Applications*, J. P. Rosca (Ed.), pp 89–97.

Koza, J. R. and Andre, D. (1995a), "Automated discovery of protein motifs with genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 38–49, MIT, Cambridge, MA, USA: AAAI.

Koza, J. R. and Andre, D. (1996), "Classifying protein segments as transmembrane domains using architecture-altering operations in genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter 8, Cambridge, MA, USA: MIT Press.

Rogers, D. (1995), "Development of the genetic function approximation algorithm," in *Genetic Algorithms: Proceedings of the Sixth International Conference (ICGA95)*, L. Eshelman (Ed.), pp 589–596, Pittsburgh, PA, USA: Morgan Kaufmann. [1]

Walters, D. E. and Hinds, R. M. (1994), "Genetically evolved receptor models (GERM): A computational approach to construction of receptor models," *Journal of Medicinal Chemistry*, 37:2527–2536.

Thedens, D. R. (1994), "Detector design by genetic programming for automated border definition in cardiac magnetic resonance images," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 170–179, Stanford, California, 94305-3079 USA: Stanford Bookstore.

B.7.12 Artificial Life

Ray, T. S. (1991), "Is it alive or is it GA," in *Proceedings of the Fourth International Conference on Genetic Algorithms*, R. K. Belew and L. B. Booker (Eds.), pp 527–534, Morgan Kaufmann.

Koza, J. R. and Rice, J. P. (1991a), "A genetic approach to artificial intelligence," in *Artificial Life II Video Proceedings*, C. G. Langton (Ed.), Redwood City, CA, USA: Addison-Wesley.

Koza, J. R., Rice, J. P., and Roughgarden, J. (1992a), "Evolution of food foraging strategies for the caribbean anolis lizard using genetic programming," Working Paper 92-06-028, Santa Fe Institute, 1399 Hyde Park Road Santa Fe, New Mexico 87501-8943 USA.

Koza, J. R., Rice, J. P., and Roughgarden, J. (1992b), "Evolution of food foraging strategies for the caribbean anolis lizard using genetic programming," *Adaptive Behavior*, 1(2):47–74.

Koza, J. R. (1994f), "Evolution of emergent cooperative behavior using genetic programming," in *Computing with Biological Metaphors*, R. Paton (Ed.), pp 280–297, London, UK: Chapman & Hall.

Koza, J. R. (1994n), "Spontaneous emergence of self-replicating and evolutionarily self-improving computer programs," in *Artificial Life III*, C. G. Langton (Ed.), volume XVII of *SFI Studies in the Sciences of Complexity*, pp 225–262, Redwood City, CA, USA: Addison-Wesley.

Reynolds, C. W. (1992), "An evolved, vision-based behavioral model of coordinated group motion," in *From Animals to Animats (Proceedings of Simulation of Adaptive Behaviour)*, Meyer and Wilson (Eds.), MIT Press.

Reynolds, C. W. (1994e), "An evolved, vision-based behavioral model of obstacle avoidance behaviour," in *Artificial Life III*, C. G. Langton (Ed.), volume XVII of *SFI Studies in the Sciences of Complexity*, pp 327–346, Addison-Wesley.

Reynolds, C. W. (1994b), "The difficulty of roving eyes," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 262–267, Orlando, Florida, USA: IEEE Press.

Iba, H., de Garis, H., and Higuchi, T. (1993a), "Evolutionary learning of predatory behaviors based on structured classifiers," in *From Animals to Animats 2: Proceedings of the Second International Conference on Simulation of Adaptive Behavior*, J. A. Meyer, H. L. Roitblat, and S. W. Wilson (Eds.), MIT Press.

Haynes, T. D. (1994), "A simulation of adaptive agents in a hostile environment," Master's thesis, University of Tulsa, Tulsa, OK, USA.
`http://euler.mcs.utulsa/edu/~haynes/haynes.html`

Haynes, T., Wainwright, R., and Sen, S. (1994), "Evolving cooperation strategies," Technical Report UTULSA-MCS-94-10, The University of Tulsa, Tulsa, OK, USA.
`http://euler.mcs.utulsa.edu/~haynes/haynes.html`

Haynes, T. D. and Wainwright, R. L. (1995), "A simulation of adaptive agents in hostile environment," in *Proceedings of the 1995 ACM Symposium on Applied Computing*, K. M. George, J. H. Carroll, E. Deaton, D. Oppenheim, and J. Hightower (Eds.), pp 318–323, Nashville, USA: ACM Press.
`http://euler.mcs.utulsa.edu/~haynes/sac95.html`

Haynes, T. D., Wainwright, R. L., and Sen, S. (1995c), "Evolving cooperating strategies," in *Proceedings of the first International Conference on Multiple Agent Systems*, V. Lesser (Ed.), p 450, San Francisco, USA: AAAI Press/MIT Press, Poster.
`http://euler.mcs.utulsa.edu/~haynes/icmas95.ps`

Haynes, T. and Sen, S. (1995a), "Evolving behavioral strategies in predators and prey," in *IJCAI-95 Workshop on Adaptation and Learning in Multiagent Systems*, Montreal, Quebec, Canada: Morgan Kaufmann.
`http://euler.mcs.utulsa.edu/~haynes/haynes.html`

Haynes, T., Sen, S., Schoenefeld, D., and Wainwright, R. (1995a), "Evolving a team," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 23–30, MIT, Cambridge, MA, USA: AAAI.

Haynes, T. and Sen, S. (1995b), "Evolving behavioral strategies in predators and prey," in *Adaptation and Learning in Multiagent Systems*, G. Weiß and S. Sen (Eds.), Lecture Notes in Artificial Intelligence, Berlin, Germany: Springer Verlag.

Davis, J. (1994), "Single populations v. co-evolution," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 20–27, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Dworman, G., Kimbrough, S. O., and Laing, J. D. (1995), "Bargaining in a three-agent coalition game: An application of genetic programming," in *Working Notes for the AAAI Symposium on Genetic Programming*, E. S. Siegel and J. R. Koza (Eds.), pp 9–16, MIT, Cambridge, MA, USA: AAAI.

Ito, A. and Yano, H. (1995), "The emergence of cooperation in a society of autonomous agents – the prisoner's dilemma game under the disclosure of contract histories –," in *ICMAS-95 Proceedings First International Conference on Multi-Agent Systems*, V. Lesser (Ed.), pp 201–208, San Francisco, California, USA: AAAI Press/MIT Press. [1]

Pak, S.-N. (1994), "Another approach to the synthesis of life," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 136–146, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Raik, S. and Durnota, B. (1994), "The evolution of sporting strategies," in *Complex Systems: Mechanisms of Adaption*, R. J. Stonier and X. H. Yu (Eds.), pp 85–92, IOS Press.
`http://www.sd.monash.edu.au/Tech_Reports/P94-2.ps`

Segal, J. (1994), "Concurrent evolution of territory defining behavior in birds using genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 120–129, Stanford, California, 94305-3079 USA: Stanford Bookstore.

Spitz, S. (1994b), "Evolving stopping rule mating strategies using genetic programming," in *Artificial Life at Stanford 1994*, J. R. Koza (Ed.), pp 163–171, Stanford, California, 94305-3079 USA: Stanford Bookstore.

B.7.13 Game Theory

Koza, J. R. (1992d), "Genetic evolution and co-evolution of game strategies," in *The International Conference on Game Theory and Its Applications, Stony Brook, New York. July 15, 1992*.

Ferrer, G. J. and Martin, W. N. (1995), "Using genetic programming to evolve board evaluation functions for a boardgame," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.7.14 Computer Application Porting

Ryan, C. and Walsh, P. (1995), "Automatic conversion of programs from serial to parallel using genetic programming - the paragen system," in *Proceedings of ParCo'95*, North-Holland.
`ftp://odyssey.ucc.ie/pub/genetic/paragen.ps.Z`

B.7.15 Neural Networks

Koza, J. R. and Rice, J. P. (1991b), "Genetic generation of both the weights and architecture for a neural network," in *Proceedings of IJCNN-91*, volume II, pp 397–404.

Gruau, F. (1992a), "Cellular encoding of genetic neural networks," Technical report 92-21, Laboratoire de l'Informatique du Parallilisme. Ecole Normale Supirieure de Lyon, France.

Gruau, F. (1992b), "Genetic synthesis of boolean neural networks with a cell rewriting developmental process," in *Proceedings of the Workshop on Combinations of Genetic Algorithms and Neural Networks (COGANN92)*, J. D. Schaffer and D. Whitley (Eds.), pp 55–74, The IEEE Computer Society Press. [1]

Gruau, F. (1993a), "Cellular encoding as a graph grammar," *IEE Colloquium on Grammatical Inference: Theory, Applications and Alternatives*, (Digest No.092):17/1–10. [1]

Gruau, F. (1993b), "Genetic synthesis of modular neural networks," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, pp 318–325, Morgan Kaufmann.

Gruau, F. and Whitley, D. (1993b), "The cellular development of neural networks: The interaction of learning and evolution," Technical report 93-04, Laboratoire de l'Informatique du Parallilisme, Ecole Normale Supirieure de Lyon, France.

Gruau, F. and Whitley, D. (1993a), "Adding learning to the cellular development process: a comparative study," *Evolutionary Computation*, 1(3):213–233.

Gruau, F. (1994b), *Neural Network Synthesis using Cellular Encoding and the Genetic Algorithm.*, PhD thesis, Laboratoire de l'Informatique du Parallilisme, Ecole Normale Supirieure de Lyon, France.
`ftp://lip.ens-lyon.fr/pub/Rapports/PhD/PhD94-01-E.ps.Z`
`ftp://lip.ens-lyon.fr/pub/Rapports/PhD/PhD94-01-F.ps.Z`

Gruau, F. (1994a), "Genetic micro programming of neural networks," in *Advances in Genetic Programming*, K. E. Kinnear, Jr. (Ed.), Chapter 24, MIT Press.

Gruau, F. and Whitley, D. (1995), "A programming language for artificial development," in *Evolutionary Programming IV Proceedings of the Fourth Annual Conference on Evolutionary Programming*, J. R. McDonnell, R. G. Reynolds, and D. B. Fogel (Eds.), pp 415–434, San Diego, CA, USA: MIT Press. [1]

Gruau, F. (1995), "Automatic definition of modular neural networks," *Adaptive Behaviour*, 3(2):151–183.

Zhang, B.-T. and Mühlenbein, H. (1993b), "Genetic programming of minimal neural nets using Occam's razor," in *Proceedings of the 5th International Conference on Genetic Algorithms, ICGA-93*, S. Forrest (Ed.), pp 342–349, Morgan Kaufmann.

Zhang, B.-T. and Mühlenbein, H. (1993a), "Evolving optimal neural networks using genetic algorithms with Occam's razor," *Complex Systems*, 7:199–220.

Zhang, B.-T. and Mühlenbein, H. (1994), "Synthesis of sigma-pi neural networks by the breeder genetic programming," in *Proceedings of IEEE International Conference on Evolutionary Computation (ICEC-94), World Congress on Computational Intelligence*, pp 318–323, Orlando, Florida, USA: IEEE Computer Society Press.

Zhang, B.-T. (1994), "Effects of Occam's razor in evolving sigma-pi neural networks," in *Lecture Notes in Computer Science 866: Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 462–471, Jerusalem: Springer-Verlag.

Bengio, S., Bengio, Y., and Cloutier, J. (1994), "Use of genetic programming for the search of a new learning rule for neutral networks," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, pp 324–327, Orlando, Florida, USA: IEEE Press.

B.7.16 Simulated Annealing

Thonemann, U. W. (1992), "Verbesserung des simulated annealing unter anwendung genetischer programmierung am beispiel des diskreten quadratischen layoutproblems," Master's thesis, University of Paderborn, Germany.

Thonemann, U. W. (1994), "Finding improved simulated annealing schedules with genetic programming," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, pp 391–395, Orlando, Florida, USA: IEEE Press.

B.7.17 Fuzzy Logic

Edmonds, A. N., Burkhardt, D., and Adjei, O. (1995), "Genetic programming of fuzzy logic production rules," in *1995 IEEE Conference on Evolutionary Computation*, Perth, Australia: IEEE Press.

B.7.18 Artistic

Sims, K. (1991a), "Artificial evolution for computer graphics," Technical Report TR-185, Thinking Machines Corporation.

Sims, K. (1991b), "Artificial evolution for computer graphics," *ACM Computer Graphics*, 25(4):319–328, SIGGRAPH '91 Proceedings.

Sims, K. (1991c), "panspermia," in *Artificial Life II Video Proceedings*, C. G. Langton (Ed.), Addison-Wesley. [1]

Sims, K. (1992a), "Interactive evolution of dynamical systems," in *Toward a Practice of Autonomous Systems: Proceedings of the First European Conference on Artificial Life*, F. J. Varela and P. Bourgine (Eds.), pp 171–178, Paris, France: MIT Press.

Sims, K. (1992b), "Interactive evolution of equations for procedural models," in *Proceedings of IMAGINA conference, Monte Carlo, January 29-31, 1992*.

Sims, K. (1993b), "Interactive evolution of equations for procedural models," *The Visual Computer*, 9:466–476.

Sims, K. (1993a), "Evolving images," , Lecture presented at Centre George Pompidou, Paris on March 4, 1993. Notebook. Number 5.

Koza, J. R. (1993c), "Discovery of rewrite rules in lindenmayer systems and state transition rules in cellular automata via genetic programming," in *Symposium on Pattern Formation (SPF-93), Claremont, California, USA*.

Das, S., Franguidakis, T., Papka, M., DeFanti, T. A., and Sandin, D. J. (1994), "A genetic programming application in virtual reality," in *Proceedings of the first IEEE Conference on Evolutionary Computation*, volume 1, pp 480–484, Orlando, Florida, USA: IEEE Press, Part of 1994 IEEE World Congress on Computational Intelligence, Orlando, Florida.

Jacob, C. (1994), "Genetic L-system programming," in *Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 334–343, Jerusalem: Springer-Verlag.

B.7.18.1 Music

Spector, L. and Alpern, A. (1994), "Criticism, culture, and the automatic generation of artworks," in *Proceedings of Twelfth National Conference on Artificial Intelligence*, pp 3–8, Seattle, Washington, USA: AAAI Press/MIT Press.

Spector, L. and Alpern, A. (1995), "Induction and recapitulation of deep musical structure," in *Proceedings of International Joint Conference on Artificial Intelligence, IJCAI'95 Workshop on Music and AI*.

B.7.18.2 Entertainment

Sugiyama, T., Kido, T., and Nakanishi, M. (1995), "Evolving robot strategy for open ended game," in *Progress in Evolutionary Computation*, X. Yao (Ed.), volume 956 of *Lecture Notes in Artificial Intelligence*, pp 225–235, Heidelberg, Germany: Springer-Verlag.

B.7.19 Scheduling and other Constrained Problems

Atlan, L., Bonnet, J., and Naillon, M. (1994), "Learning distributed reactive strategies by genetic programming for the general job shop problem," in *Proceedings of the 7th annual Florida Artificial Intelligence Research Symposium, Pensacola, Florida, USA*, IEEE Press.
`ftp://ftp.ens.fr/pub/reports/bioligie/disgajsp.ps.Z`

Wada, K., Wada, Y., Doi, H., Tanaka, S., and Furusawa, M. (1994), "Evolutionary systems: Structures and functions," in *Proceedings of IEEE International Conference on Evolutionary Computation (ICEC-94), World Congress on Computational Intelligence*, pp 796–801, Orlando, Florida, USA: IEEE Computer Society Press, New York. [1]

Grimes, C. A. (1995), "Application of genetic techniques to the planning of railway track maintenance work," in *First International Conference on Genetic Algorithms in Engineering Systems: Innovations and Applications, GALESIA*, A. M. S. Zalzala (Ed.), volume 414, pp 467–472, Sheffield, UK: IEE.

Min, S. L. (1994), "Feasibility of evolving self-learned pattern recognition applied towards the solution of a constrained system using genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 110–119, Stanford, California, 94305-3079 USA: Stanford Bookstore.

B.7.20 Highly Reliable Computing

Dickinson, A. (1994), "Evolution of damage-immune programs using genetic programming," in *Genetic Algorithms at Stanford 1994*, J. R. Koza (Ed.), pp 21–30, Stanford, California, 94305-3079 USA: Stanford Bookstore.

B.8 Collected Works and Bibliographies

Kinnear, Jr., K. E. (1994a), *Advances in Genetic Programming*, Cambridge, MA: MIT Press.
`http://www-cs-faculty.stanford.edu/~koza/aigp.html`

Angeline, P. J. and Kinnear, Jr., K. E. (1996), *Advances in Genetic Programming 2*, Cambridge, MA, USA: MIT Press.

Rosca, J. P. (1995e), "Proceedings of the workshop on genetic programming: From theory to real-world applications," Technical Report 95.2, University of Rochester, National Resource Laboratory for the Study of Brain and Behavior, Rochester, New York, USA, Held in conjunction with the twelfth International Conference on Machine Learning, Tahoe City, California, USA.

Siegel, E. V. and R, K. J. (1995), "Working notes AAAI-95 fall symposium series genetic programming," Technical note, The American Association for Artificial Intelligence, Held at MIT, Cambridge, MA, USA, 10–12 November 1995.
`http://www.cs.columbia.edu/~evs/gpsym95/working.html`

Koza, J. R. (1993a), *Artificial Life at Stanford 1993*, Stanford, California, 94305-3079 USA, Phone 415-329-1217 or 800-533-2670: Stanford University Bookstore.

Koza, J. R. (1993d), *Genetic Algorithms at Stanford 1993*, Stanford, California, 94305-3079 USA, Phone 415-329-1217 or 800-533-2670: Stanford University Bookstore.

Koza, J. R. (1994b), *Artificial Life at Stanford 1994*, Stanford, California, 94305-3079 USA, Phone 415-329-1217 or 800-533-2670: Stanford University Bookstore.

Koza, J. R. (1994g), *Genetic Algorithms at Stanford 1994*, Stanford, California, 94305-3079 USA, Phone 415-329-1217 or 800-533-2670: Stanford University Bookstore.

Koza, J. R. (1995c), *Genetic Algorithms and Genetic Programming at Stanford 1995*, Stanford, California, 94305-3079 USA, Phone 415-329-1217 or 800-533-2670: Stanford University Bookstore.

Alander, J. T. (1995), "An indexed bibliography of genetic programming," Report Series no 94-1-GP, Department of Information Technology and Industrial Management, University of Vaasa, Finland.
`ftp://ftp.uwasa.fi/cs/report94-1/gaGPbib.ps.Z`

Alander, J. T. (1994), *An Indexed Bibliography of Genetic Algorithms: Years 1957–1993*, Vaasa, Finland: Art of CAD ltd.

Langdon, W. B. (1996a), "A bibliography for genetic programming," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter B, Cambridge, MA, USA: MIT Press.
`ftp://cs.ucl.ac.uk/genetic/biblio/README.html`

Tufts, P. (1996), "Genetic programming resources on the world-wide web," in *Advances in Genetic Programming 2*, P. J. Angeline and K. E. Kinnear, Jr. (Eds.), Chapter A, Cambridge, MA, USA: MIT Press.

B.9 Book Reviews

Hand, D. J. (1994), "Evolutionary computation," , Review of Koza's "Genetic Programming".

B.10 Comparison With Other Techniques

Juels, A. and Wattenberg, M. (1995), "Stochastic hillclimbing as a baseline method for evaluating genetic algorithms," Technical Report CSD-94-834, Department of Computer Science, University of California at Berkeley, USA.

Lang, K. J. (1995), "Hill climbing beats genetic search on a boolean circuit synthesis of Koza's," in *Proceedings of the Twelfth International Conference on Machine Learning*, Tahoe City, California, USA: Morgan Kaufmann.

Koza, J. R. (1995d), "A response to the ML-95 paper entitled "Hill climbing beats genetic search on a boolean circuit synthesis of Koza's"," .

B.11 Patents

Koza, J. R. (1990e), "Non-linear genetic algorithms for solving problems," U.S. Patent, filed may 20, 1988, issued june 19, 1990, 4,935,877. Australian patent 611,350 issued september 21, 1991. Canadian patent 1,311,561 issued december 15, 1992.

Koza, J. R. (1992h), "Non-linear genetic algorithms for solving problems by finding a fit composition of functions," U.S. Patent, filed march 28, 1990, issued august 4, 1992, 5,136,686.

Koza, J. R. and Rice, J. P. (1992e), "A non-linear genetic process for use with plural co-evolving populations," U.S. Patent, filed september 18, 1990, issued september 15, 1992, 5,148,513.

Koza, J. R. and Rice, J. P. (1992d), "A non-linear genetic process for problem solving using spontaneously emergent self-replicating and self- improving entities," U.S. Patent, application filed june 16, 1992, issued february 14, 1995, 5,390,282.

Koza, J. R. and Rice, J. P. (1992c), "A non-linear genetic process for data encoding and for solving problems using automatically defined functions," U.S. Patent, application filed May 11, 1992, issued August 30, 1994, 5,343,554.

Koza, J. R., Andre, D., and Tackett, W. A. (1994), "Evolution of the architecture of a multi-part program to solve a problem using architecture altering operations," U.S. Patent Application, filed August 4, 1994.

B.12 Other uses of the term "Genetic Programming"

de Garis, H., Iba, H., and Furuya, T. (1992), "Differentiable chromosomes: The genetic programming of switchable shape-genes," in *Parallel Problem Solving from Nature 2*, R. Manner and B. Manderick (Eds.), pp 489–498, Brussels, Belgium: Elsevier Science.

de Garis, H. (1993), "Evolving a replicator the genetic programming of self reproduction in cellular automata," in *ECAL-93 Self organisation and life: from simple rules to global complexity*, pp 274–284.

de Garis, H. (1994), "CAM-BRAIN the genetic programming of an artificial brain which grows/evolves at electronic speeds in a cellular automata machine," in *Proceedings of the 1994 IEEE World Congress on Computational Intelligence*, volume 1, pp 337–339b, Orlando, Florida, USA: IEEE Press. [1]

Higuchi, T., IBA, H., and Manderick, B. (1994), "Applying evolvable hardware to autonomous agents," in *Parallel Problem Solving from Nature III*, Y. Davidor, H.-P. Schwefel, and R. Männer (Eds.), pp 524–533, Jerusalem: Springer-Verlag. [1]

B.13 Some Other Genetic Algorithms Approaches to Program Evolution

Self, S. (1992), "On the origin of effective procedures by means of artificial selection," Master's thesis, Birkbeck College, University of London, UK. [1]

Land, M. and Belew, R. K. (1995), "A programming language for artificial development," in *Evolutionary Programming IV Proceedings of the Fourth Annual Conference on Evolutionary Programming*, J. R. McDonnell, R. G. Reynolds, and D. B. Fogel (Eds.), pp 403–413, San Diego, CA, USA: MIT Press. [1]

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