# An Indexed Bibliography of Genetic Programming

compiled by

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***Dedicated to*** **John Koza**

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available via anonymous ftp: site `ftp.uwasa.fi` directory `cs/report94-1` file `gaGPbib.ps.Z`

## Trademarks



## Warning

While this bibliography has been compiled with the utmost care, the editor takes no responsibility for any errors, missing information, the contents or quality of the references, nor for the usefulness and/or the consequences of their application. The fact that a reference is included in this publication does not imply a recommendation. The use of any of the methods in the references is entirely at the user's own responsibility. Especially the above warning applies to those references that are marked by trailing '†' (or '*'), which are the ones that the editor has unfortunately not had the opportunity to read. An abstract was available of the references marked with '*'.

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# Chapter 1

# Preface

> " Living organism are consummate problem solvers. They exhibit a versatility that puts the best computer programs to shame. "
>
> *John H. Holland,* [1]

The material of this bibliography has been extracted from the genetic algorithm bibliography [2], which when this report was compiled (July 9, 2003) contained 19122 items and which has been collected from several sources of genetic algorithm literature including Usenet newsgroup `comp.ai.genetic` and the bibliographies [3, 4, 5, 6]. The following index periodicals and databases have been used systematically

- A: *International Aerospace Abstracts:* Jan. 1995 – Sep. 1998
- ACM: *ACM Guide to Computing Literature:* 1979 – 1993/4
- BA: *Biological Abstracts:* July 1996 - Aug. 1998
- CA: *Computer Abstracts:* Jan. 1993 – Feb. 1995
- CCA: *Computer & Control Abstracts:* Jan. 1992 – Dec. 1999 (except May -95)
- ChA: *Chemical Abstracts:* Jan. 1997 - Dec. 2000
- CTI: *Current Technology Index* Jan./Feb. 1993 – Jan./Feb. 1994
- DAI: *Dissertation Abstracts International:* Vol. 53 No. 1 – Vol. 56 No. 10 (Apr. 1996)
- EEA: *Electrical & Electronics Abstracts:* Jan. 1991 – Apr. 1998
- EI A: *The Engineering Index Annual:* 1987 – 1992
- EI M: *The Engineering Index Monthly:* Jan. 1993 – Apr. 1998 (except May 1997)
- Esp@cenet *patents* – Apr. 2002
- IEEE: *IEEE and IEE Journals* – Fall 2002
- N: *Scientific and Technical Aerospace Reports:* Jan. 1993 - Dec. 1995 (except Oct. 1995)
- NASA *NASA ADS www bibliography database:* – Dec. 2002
- P: *Index to Scientific & Technical Proceedings:* Jan. 1986 – Dec 1999 (except Nov. 1994)
- PA: *Physics Abstracts:* Jan. 1997 – June 1999
- PubMed: *National Library of Medicine* Jan. 2000 – Oct. 2000
- SPIE Web *The International Society for Optical Engineering* – June 2002

## 1.1 Your contributions erroneous or missing?

The bibliography database is updated on a regular basis and certainly contains many errors and inconsistences. The editor would be glad to hear from any reader who notices any errors, missing information, articles etc. In the future a more complete version of this bibliography will be prepared for the genetic programming research community and others who are interested in this rapidly growing area of genetic algorithms.

When submitting updates to the database, paper copies of already published contributions are preferred. Paper copies (or `ftp` ones) are needed mainly for indexing. We are also doing reviews of different aspects and applications of GAs where we need as complete as possible collection of GA papers. Please, do not forget to include complete bibliographical information: copy also proceedings volume title pages, journal table of contents pages, etc. Observe that there exists several versions of each subbibliography, therefore **the reference numbers are not unique and should not be used alone in communication**, use the `key` appearing as the last item of the reference entry instead.

Complete bibliographical information is really helpful for those who want to find your contribution in their libraries. If your paper was worth writing and publishing it is certainly worth to be referenced right in a bibliographical database read daily by GA researchers, both newcomers and established ones.

For further instructions and information see `ftp.uwasa.fi/cs/GAbib/README`.

### 1.1.1 How to cite this report?

The complete BiBTEX record for this report is shown below:

```
@TECHREPORT{gaGPbib,
     KEY = "GP",
     ANNOTE = "*on,*FIN,bibliography /special,genetic programming /bibliography,bibliography /genetic programming",
     AUTHOR = "Jarmo T. Alander",
     TITLE = "Indexed Bibliography of Genetic{\BL}Programming",
     INSTITUTION = "University of Vaasa, Department of Information Technology and Production Economics",
     TYPE = "Report",
     NUMBER = "94-1-GP",
     NOTE = "(\ftp{ftp.uwasa.fi}{cs/report94-1}{gaGPbib.ps.Z})",
     YEAR = 1995
}
```

You can also use the BiBTEX file `GASUB.bib`, which is available in our ftp site `ftp.uwasa.fi` in directory `cs/report94-1` and contains records for all GA subbibliographies.

## 1.2 How to get this report via `Internet`?

Versions of this bibliography are available via anonymous `ftp` or `www` from the following site:

| *media* | *country* | *site* | *directory* | *file* |
|---|---|---|---|---|
| `ftp` | Finland | `ftp.uwasa.fi` | `/cs/report94-1` | `gaGPbib.ps.Z` |

Observe that these versions may be somewhat different and perhaps reduced as compared to this volume that you are now reading. Due to technical problems in transforming LATEXdocuments into `html` ones the `www` versions contain usually less information than the corresponding `ftp` ones. It is also possible that the `www` version is completely unreachable.

The directory also contains some other indexed GA bibliographies shown in table A.1. In case you do not find a proper one please let us know: it may be easy to tailor a new one.

## 1.3 Acknowledgement

The editor wants to acknowledge all who have kindly supplied references, papers and other information on genetic programming literature. At least the following GA researchers have already kindly supplied their complete autobibliographies and/or proofread references to their papers: Dan Adler, Patrick Argos, Jarmo T. Alander, James E. Baker, Wolfgang Banzhaf, Helio J. C. Barbosa, Hans-Georg Beyer, Christian Bierwirth, Peter Bober Joachim Born, Ralf Bruns, I. L. Bukatova, Thomas Bäck, Chhandra Chakraborti, Nirupam Chakraborti, David E. Clark, Carlos A. Coello Coello, Yuval Davidor, Dipankar Dasgupta, Marco Dorigo, J. Wayland Eheart, Bogdan Filipič, Terence C. Fogarty, David B. Fogel, Toshio Fukuda, Hugo de Garis, Robert C. Glen, David E. Goldberg, Martina Gorges-Schleuter, Hitoshi Hemmi, Vasant Honavar, Jeffrey Horn, Aristides T. Hatjimihail, Heikki Hyötyniemi Mark J. Jakiela, Richard S. Judson, Bryant A. Julstrom, Charles L. Karr, Akihiko Konagaya, Aaron Konstam, John R. Koza, Kristinn Kristinsson, Malay K. Kundu, D. P. Kwok, Jouni Lampinen, Jorma Laurikkala, Gregory Levitin, Carlos B. Lucasius, Timo Mantere, Michael de la Maza, John R. McDonnell, J. J. Merelo, Laurence D. Merkle, Zbigniew Michalewics, Melanie Mitchell, David J. Nettleton, Volker Nissen, Ari Nissinen, Tatsuya Niwa, Tomasz Ostrowski, Kihong Park, Jakub Podgórski, Nicholas J. Radcliffe, Colin R. Reeves, Gordon Roberts, David Rogers, David Romero, Sam Sandqvist, Ivan Santibáñez-Koref, Marc Schoenauer, Markus Schwehm, Hans-Paul Schwefel, Michael T. Semertzidis, Davil L. Shealy, Moshe Sipper, William M. Spears, Donald S. Szarkowicz, El-Ghazali Talbi, Masahiro Tanaka, Leigh Tesfatsion, Peter M. Todd, Marco Tomassini, Andrew L. Tuson, Kanji Ueda, Jari Vaario, Gilles Venturini, Hans-Michael Voigt, Roger L. Wainwright, D. Eric Walters, James F. Whidborne, Stefan Wiegand, Steward W. Wilson, Xin Yao, Xiaodong Yin, and Ljudmila A. Zinchenko.

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# Chapter 2

# Introduction

> "Many scientist, possibly most scientist, just do science without thinking too much about it. They run experiments, make observations, show how certain data conflict with more general views, set out theories, and so on. Periodically, however, some of us—scientists included—step back and look at what is going on in science."
>
> *David L., Hull,* [7]

The table 2.1 gives the queries that have been used to extract this bibliography. The query system as well as the indexing tools used to compile this report from the BiBTEX-database [8] have been implemented by the author mainly as sets of simple `awk` and `gawk` programs [9, 10].

| *string* | *field* | *class* |
|---|---|---|
| `genetic programming` | `ANNOTE` | Genetic programming |
| `enetic programming` | `TITLE` | Genetic programming |
| `enetic programming` | `TITLE` | Genetic programming |
| `Koza` | `AUTHOR` | Genetic programming |

Table 2.1: Queries used to extract this subbibliography from the source database.

# Chapter 3

# Statistical summaries

This chapter gives some general statistical summaries of genetic programming literature. More detailed indexes can be found in the next chapter.

References to each class (c.f table 2.1) are listed below:

- **Genetic programming** 918 references ([11]-[928])

Observe that each reference is included (by the computer) only to one of the above classes (see the queries for classification in table 2.1; the textual order in the query gives priority for classes).

| *type* | *number of items* |
|---|---|
| book | 11 |
| section of a book | 4 |
| part of a collection | 38 |
| journal article | 128 |
| proceedings article | 668 |
| report | 31 |
| manual | 2 |
| PhD thesis | 11 |
| MSc thesis | 10 |
| *others* | 15 |
| *total* | 918 |

Table 3.1: Distribution of publication type.

## 3.1 Publication type

This bibliography contains published contributions including reports and patents. All unpublished manuscripts have been omitted unless accepted for publication. In addition theses, PhD, MSc etc., are also included whether or not published somewhere.

Table 3.1 gives the distribution of publication type of the whole bibliography. Observe that the number of journal articles may also include articles published or to be published in unknown forums.

## 3.2 Annual distribution

Table 3.2 gives the number of genetic programming papers published annually. The annual distribution is also shown in fig. 3.1. The average annual growth of GA papers has been approximately 40 % during late 70's - early 90's.

## 3.3 Classification

Every bibliography item has been given at least one describing keyword or classification by the editor of this bibliography. Keywords occurring most are shown in table 3.3.

| *year* | *items* | *year* | *items* |
|---|---|---|---|
| 1958 | 1 | 1959 | 1 |
| 1960 | 0 | 1961 | 0 |
| 1962 | 0 | 1963 | 0 |
| 1964 | 0 | 1965 | 0 |
| 1966 | 0 | 1967 | 0 |
| 1968 | 0 | 1969 | 0 |
| 1970 | 0 | 1971 | 0 |
| 1972 | 0 | 1973 | 0 |
| 1974 | 0 | 1975 | 0 |
| 1976 | 0 | 1977 | 0 |
| 1978 | 0 | 1979 | 0 |
| 1980 | 0 | 1981 | 1 |
| 1982 | 0 | 1983 | 0 |
| 1984 | 0 | 1985 | 1 |
| 1986 | 2 | 1987 | 4 |
| 1988 | 0 | 1989 | 1 |
| 1990 | 16 | 1991 | 22 |
| 1992 | 33 | 1993 | 50 |
| 1994 | 113 | 1995 | 101 |
| 1996 | 153 | 1997 | 150 |
| 1998 | 50 | 1999 | 55 |
| 2000 | 62 | 2001 | 26 |
| 2002 | 29 | 2003 | 47 |
| *total* | | | 918 |

Table 3.2: Annual distribution of contributions.

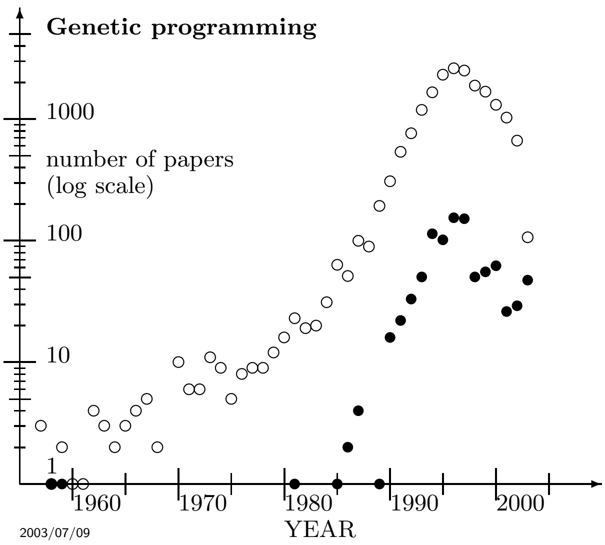


Figure 3.1: The number of papers applying **genetic programming** (•, $N = 918$ ) and total GA papers (◦, $N = 19122$ ). Observe that the last few years are most incomplete in the database.

| | |
|---|---|
| *Total* | 917 |
| genetic programming | 817 |
| analysing GP | 48 |
| neural networks | 37 |
| robotics | 36 |
| control | 35 |
| implementation | 32 |
| economics | 32 |
| machine learning | 28 |
| image processing | 24 |
| engineering | 22 |
| crossover | 21 |
| classification | 19 |
| parallel GP | 18 |
| electronics | 18 |
| comparison | 16 |
| system identification | 14 |
| data mining | 14 |
| agents | 14 |
| regression | 13 |
| signal processing | 12 |
| patent | 12 |
| scheduling | 11 |
| coevolution | 11 |
| analysing GA | 11 |
| pattern recognition | 10 |
| others | 1851 |

Table 3.3: The most popular subjects.

## 3.4 Authors

Table 3.4 gives the most productive authors.

| | |
|---|---|
| total number of authors | 931 |
| Koza, John R. | 85 |
| Iba, Hitoshi | 32 |
| Banzhaf, Wolfgang | 30 |
| Garis, Hugo de | 28 |
| Andre, David | 26 |
| Bennett III, Forrest H. | 24 |
| Nordin, Peter | 23 |
| Keane, Martin A. | 22 |
| Poli, Riccardo | 16 |
| Langdon, William B. | 15 |
| Ryan, Conor | 15 |
| Chen, Shu-Heng | 14 |
| Handley, Simon G. | 13 |
| Yeh, Chia-Hsuan | 13 |
| O'Reilly, Una-May | 12 |
| Rice, James P. | 12 |
| Wong, Man Leung | 12 |
| Angeline, Peter J. | 11 |
| Leung, Kwong Sak | 11 |
| Daida, Jason M. | 10 |
| Spector, Lee | 10 |
| Willis, Mark J. | 10 |
| 5 authors | 9 |
| 2 authors | 8 |
| 1 author | 7 |
| 13 authors | 6 |
| 9 authors | 5 |
| 14 authors | 4 |
| 41 authors | 3 |
| 139 authors | 2 |
| 685 authors | 1 |

Table 3.4: The most productive genetic programming authors.

## 3.5 Geographical distribution

Table 3.5 gives the geographical distribution of authors, when the country of the author was known. Over 80% of the references of the GA source database are classified by country.

| 2003/07/09 | *special* | | *comparison* | | *all* | |
|---|---|---|---|---|---|---|
| *country* | $n$ | % | $\delta$[%] | $\Delta$[%] | $N$ | % |
| *Total* | 837 | 100.00 | | | 17973 | 100.00 |
| United States | 321 | 38.35 | +10.52 | +38 | 5002 | 27.83 |
| United Kingdom | 101 | 12.07 | +1.60 | +15 | 1882 | 10.47 |
| Japan | 72 | 8.60 | −4.38 | −34 | 2332 | 12.98 |
| Germany | 59 | 7.05 | −0.16 | −2 | 1295 | 7.21 |
| Australia | 24 | 2.87 | +0.39 | +16 | 445 | 2.48 |
| France | 23 | 2.75 | +0.22 | +9 | 455 | 2.53 |
| Sweden | 21 | 2.51 | +2.11 | +528 | 71 | 0.40 |
| China | 19 | 2.27 | −2.30 | −50 | 821 | 4.57 |
| Taiwan | 15 | 1.79 | −0.25 | −12 | 367 | 2.04 |
| Belgium | 13 | 1.55 | +0.72 | +87 | 150 | 0.83 |
| Ireland | 13 | 1.55 | +1.33 | +605 | 40 | 0.22 |
| Canada | 10 | 1.19 | −0.29 | −20 | 266 | 1.48 |
| Finland | 9 | 1.08 | −2.03 | −65 | 559 | 3.11 |
| Spain | 9 | 1.08 | −0.52 | −32 | 287 | 1.60 |
| Italy | 8 | 0.96 | −1.90 | −66 | 514 | 2.86 |
| Austria | 7 | 0.84 | +0.26 | +45 | 104 | 0.58 |
| South Korea | 7 | 0.84 | −1.46 | −63 | 414 | 2.30 |
| Poland | 6 | 0.72 | −0.16 | −18 | 159 | 0.88 |
| Switzerland | 6 | 0.72 | −0.11 | −13 | 149 | 0.83 |
| The Netherlands | 6 | 0.72 | −0.31 | −30 | 186 | 1.03 |
| *Others* | 40 | 4.80 | −2.42 | −34 | 1300 | 7.22 |

Table 3.5: The geographical distribution of the authors working on genetic programming ($n$) compared ($\delta$ and $\Delta$) to all authors in the field of GAs ($N$). In the *comparison* column: $\delta\% = \%special - \%all$ and $\Delta = (1 - \frac{nN_{Total}}{Nn_{Total}}) \times 100\%$. $\Delta$ is the relative (%) deviation from the expected number of special papers. Observe that joint papers may have authors from several countries and that not all authors have been attributed to a country.

## 3.6 Conclusions and future

The editor believes that this bibliography contains references to most genetic programming contributions upto and including the year 1998 and the editor hopes that this bibliography could give some help to those who are working or planning to work in this rapidly growing area of genetic algorithms.

# Chapter 4

# Indexes

## 4.1 Books

The following list contains all items classified as books.



## 4.2 Journal articles

The following list contains the references to every journal article included in this bibliography. The list is arranged in alphabetical order by the name of the journal.

IEEE Transactions on Evolutionary Computation, [103, 109, 263, 265, 853, 50]

IEEE Transactions on Industrial Electronics, [267]

IEEE Transactions on Power Systems, [211]

IEEE Transactions on Systems, Man, and Cybernetics A, Systems Humans, [205]

IEICE Transactions on Fundamentals of Electronics, Communications and Computer Science, [613]

Inf. Syst. Eng. (Netherlands), [180]

Information and Software Technology, [111]

Information Processing Letters, [857]

Information Sciences, [708]

Informática y Automática (Spain), [176]

Int. Commun. Heat Mass Transf. (UK), [512]

Int. J. Knowl.-Based Intell. Eng. Syst. (Australia), [618]

Int. J. Softw. Eng. Knowl. Eng. (Singapore), [367, 779]

International Journal of Expert Systems, [786]

International Journal of Production Research, [110]

International Transactions in Operational Research, [60]

J. Changsha Univ. Electr. Power, Nat. Sci. Ed. (China), [214]

J. Chem. Phys. (USA), [599]

J. Comput. Sci. Technol. (Engl. Lang. Ed.), [638]

J. Heuristics, [44]

J. Inf. Sci. (UK), [539]

J. KISS(B), Softw. Appl. (South Korea), [187]

J. Shanghai Jiaotong Univ. (China), [565]

Journal of Economic Dynamics & Control, [586]

Journal of Hydroinformatics, [255]

Journal of the American Society for Information Science, [253]

Journal of the Japanese Society of Artificial Intelligence, [391]

Journal of Visualization and Computer Animation, [355]

Kybernetes, [892]

Neural Computation, [694]

Neural Computing & Applications, [573]

Neural Netw. World ( Czech Republic), [610]

Neural Parallel Sci. Comput. (USA), [184]

Nippon Kikai Gakkai Ronbunshu C Hen, [198]

Optical Engineering, [106, 268]

OR Spektrum, [880]

Parallel Computing (Netherlands), [543]

Pattern Recognition Letters, [270]

PC AI (USA), [497, 558]

Personal Computer World, [652, 668]

Physical Review E, [841]

Proc. Inst. Mech. Eng. I, J. Syst. Control Eng. (UK), [577]

Scientific American, [17, 806]

Scientific Computing World, [702]

Statistics and Computing, [19]

Suomen Lääkärilehti, [822]

Syst. Control Inf. (Japan), [194]

The Mathematica Journal, [170]

The Visual Computer, [919]

Tiede, [718]

VDI Berichte, [601]

total 128 articles in 87 series

## 4.3 Theses

The following two lists contain theses, first PhD theses and then Master's etc. theses, arranged in alphabetical order by the name of the school.

### 4.3.1 PhD theses

Carleton University, [775]

Ecole Normale Superieure de Lyon, [745]

The University of Texas at Austin, [304]

University of Dortmund, [854]

University of Edinburgh, [861]

University of Limburg, [910]

University of London, [811]

University of Montana, [907]

University of Rochester, [851]

University of Sao Paulo, [873]

University of Southern California, [758]

total 11 thesis in 11 schools

### 4.3.2 Master's theses

This list includes also “Diplomarbeit”, “Tech. Lic. Theses”, etc.

Marii Curie-Sklodowskiej University of Lublin, [719]

Naval Postgraduate School, [908]

Rice University, [354]

University of Glasgow, [842]

University of Idaho, [903]

University of London, [915]

University of Manchester, [883]

University of Paderborn, [925]

Universität München, [914]

Vienna University of Economics and Business Admimistration, [793]

total 10 thesis in 10 schools

## 4.4 Report series

The following list contains references to all papers published as technical reports. The list is arranged in alphabetical order by the name of the institute.

Bolt Beranek and Newman, [664]

Dassault-Aviation, [885]

Ecole Normale Superiore, [660]

Ecole Normale Supérieure de Lyon, [896, 900]

Electrotechnical Laboratory, [337, 394, 485, 489, 927]

Florida Atlantic University, [515]

INRIA, [632]

Institute of Naval Medicine, [911]

Mitsubishi Electric Research Laboratories, [651]

Ohio State University, [913]

Santa Fe Institute, [333, 380, 94, 667]

Stanford University, [26, 32, 65]

University of California at Berkeley, [909]

University of Dortmund, [392, 395, 396, 814]

University of London, [813]

University of Massachusetts, [648]

University of Rochester, [335]

University of Vaasa, [928]

total 31 reports in 18 institutes

## 4.5 Patents

The following list contains the names of the patents of genetic programming. The list is arranged in alphabetical order by the name of the patent.

A non-linear genetic algorithms for solving problems, [84, 95]

A non-linear genetic process for data encoding and for solving problems using automatically defined functions, [91]

A non-linear genetic process for problem solving using spontaneously emergent self-replicating and self-improving entities, [92]

Automatic programming device, automatic programming method, and recording medium, [879]

Distributed genetic programming, [627]

Method and apparatus for automated design of complex structures using genetic programming, [62]

Non-linear genetic algorithms for solving problems, [68]

Non-linear genetic algorithms for solving problems by finding a fit composition of functions, [72]

Non-linear genetic process for data encoding and for solving problems using automatically defined functions, [96]

Non-linear genetic process for use with co-evolving populations, [74]

Non-linear genetic process for use with plural co-evolving populations, [75]

total 11 patents

## 4.6 Authors

The following list contains all genetic programming authors and references to their known contributions.

total 916 articles by 931 different authors

## 4.7 Subject index

All subject keywords of the papers given by the editor of this bibliography are shown next.

## 4.8 Annual index

The following table gives references to the contributions by the year of publishing.

1958, [894]

1959, [895]

1981, [892]

1985, [888]

1986, [893, 903]

1987, [886, 890, 891, 914]

1989, [63]

1990, [904, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 672, 673, 674, 675]

1991, [883, 884, 655, 660, 66, 76, 77, 78, 79, 80, 81, 82, 83, 84, 916, 921, 669, 671, 676, 677, 678, 679]

1992, [690, 691, 896, 897, 902, 653, 654, 905, 907, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 663, 910, 666, 667, 912, 915, 917, 918, 925, 680, 681, 682]

1993, [647, 648, 885, 649, 650, 651, 652, 887, 889, 898, 899, 900, 901, 216, 656, 657, 658, 659, 906, 908, 661, 662, 97, 98, 99, 100, 101, 909, 664, 665, 911, 668, 913, 919, 920, 217, 922, 670, 923, 102, 924, 683, 684, 685, 926, 927, 686, 687, 688, 689]

1994, [720, 721, 284, 722, 285, 286, 287, 288, 723, 289, 290, 291, 724, 292, 293, 294, 725, 295, 296, 726, 727, 297, 298, 728, 729, 730, 299, 18, 300, 301, 302, 303, 304, 731, 732, 733, 305, 306, 734, 735, 307, 308, 736, 309, 310, 737, 311, 738, 312, 739, 740, 165, 313, 741, 314, 315, 316, 317, 318, 319, 320, 321, 742, 322, 166, 323, 324, 325, 326, 327, 743, 744, 328, 329, 330, 331, 745, 332, 746, 747, 333, 334, 335, 748, 749, 750, 751, 752, 336, 337, 753, 754, 338, 755, 339, 340, 756, 341, 342, 757, 19, 758, 759, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29]

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## Notations

†(ref) = the bibliography item does not belong to my collection of genetic papers.
(ref) = citation source code. ACM = ACM Guide to Computing Literature, EEA = Electrical & Electronics Abstracts, BA = Biological Abstracts, CCA = Computers & Control Abstracts, CTI = Current

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**Book**: Author(s), *Title*, Publisher, Publisher's address, year.

**Example**

John H. Holland. *Adaptation in Natural and Artificial Systems.* The University of Michigan Press, Ann Arbor, 1975.

**Journal article**: Author(s), Title, *Journal*, volume(number): first page – last page, [month,] year.

**Example**

David E. Goldberg. Computer-aided gas pipeline operation using genetic algorithms and rule learning. Part I: Genetic algorithms in pipeline optimization. *Engineering with Computers*, 3(?):35–45, 1987. † .

**Note:** the number of the journal unknown, the article has not been seen.

**Proceedings article**: Author(s), Title, editor(s) of the proceedings, *Title of Proceedings*, [volume,] pages, location of the conference, date of the conference, publisher of the proceedings, publisher's address.

**Example**

John R. Koza. Hierarchical genetic algorithms operating on populations of computer programs. In N. S. Sridharan, editor, *Eleventh International Joint Conference on Artificial Intelligence (IJCAI-89)*, pages 768–774, Detroit, MI, 20.-25. August 1989. Morgan Kaufmann, Palo Alto, CA. † .

**Technical report**: Author(s), Title, type and number, institute, year.

**Example**

Thomas Bäck, Frank Hoffmeister, and Hans-Paul Schwefel. Applications of evolutionary algorithms. Technical Report SYS-2/92, University of Dortmund, Department of Computer Science, 1992.

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Global optimisation and search heuristics called genetic algorithm mimics evolution in nature using recombination and selection from a set of solution trials called population. One of the most prominent attractive features of genetic algorithms from the practical point of view of software techniques is their simplicity, which makes them easy to implement and tailor to solve practical search and optimisation problems.

In spite of the seemingly simple processing, the genetic algorithms are good at solving some problems that are known to be hard. The simplicity, generality, flexibility, parallelism, and the good problem solving capability have made genetic algorithm very popular among various disciplines desperately searching methods to solve difficult optimisation problems.

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| gaORbib.ps.Z | 1567 | 2003/04/10 | GA in operations research |
| gaPARAbib.ps.Z | 740 | 2003/07/08 | Parallel and distributed GA |
| gaPARETObib.ps.Z | 406 | 2003/07/08 | Pareto optimization (**new**) |
| gaPATENTbib.ps.Z | 458 | 2003/07/08 | GA patents (**new**) |
| gaPATTERNbib.ps.Z | 1456 | 2003/05/24 | GA in pattern recognition incl. LCS (**new**) |
| gaPHYSbib.ps.Z | 2026 | 2003/05/20 | GA in physical sciences **new**; previously in `gaCHEMPHYSbib.ps.Z` |
| gaPOWERbib.ps.Z | 891 | 2003/05/22 | GA in power engineering |
| gaPROTEINbib.ps.Z | 432 | 2003/07/08 | GA in protein research |
| gaQCbib.ps.Z | 449 | 2003/04/04 | quantum computing (**new**) |
| gaROBOTbib.ps.Z | 704 | 2003/04/25 | GA in robotics |
| gaSAbib.ps.Z | 307 | 2003/07/08 | GA and simulated annealing |
| gaSCHEDULINGbib.ps.Z | 768 | 2003/04/10 | GA in scheduling |
| gaSIGNALbib.ps.Z | 2061 | 2003/07/07 | GA in signal and image processing |
| gaSIMULAbib.ps.Z | 929 | 2003/04/10 | GA in simulation (**new**) |
| gaTELEbib.ps.Z | 757 | 2003/06/28 | GA in telecom (**new**) |
| gaTHEORYbib.ps.Z | 2225 | 2003/07/09 | Theory and analysis of GA |
| gaTHESESbib.ps.Z | 457 | 2003/07/09 | PhD etc theses |
| gaUKbib.ps.Z | 1907 | 2003/07/09 | GA in United Kingdom |
| gaVLSIbib.ps.Z | 765 | 2003/07/09 | GA in electronics, VLSI design and testing |

Table A.1: Indexed genetic algorithm special bibliographies available online in directory `ftp://ftp.uwasa.fi/cs/report94-1`.