An Indexed Bibliography of Genetic Algorithms in Physical Sciences

compiled by

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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 (April 7, 2008) contained 20270 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 algorithms in physical sciences 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{gaPHYSbib,
     KEY = "PHYS",
     ANNOTE = "*on,*FIN,bibliography /special,bibliography /physics",
     AUTHOR = "Jarmo T. Alander",
     TITLE = "Indexed Bibliography of Genetic Algorithms in Physical Sciences",
     INSTITUTION = "University of Vaasa, Department of Information Technology and Production Economics",
     TYPE = "Report",
     NUMBER = "94-1-PHYS",
     NOTE = "(Previously included in \cite{gaCHEMPHYSbib}; \ftp{ftp.uwasa.fi}{cs/report94-1}{gaPHYSbib.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`	`gaPHYSbib.ps(.Z)`
`ftp`	Finland	`ftp.uwasa.fi`	`/cs/report94-1`	`gaPHYSbib.pdf`

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 algorithms in physical sciences 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, Timo Poranen, 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.

The editor also wants to acknowledge Elizabeth Heap-Talvela for her kind proofreading of the manuscript of this bibliography and Tea Ollanketo and Sakari Kauvosaari for updating the database. Prof. Timo Salmi and the Computer Centre of University of Vaasa is acknowledged for providing and managing the online ftp site `ftp.uwasa.fi`, where these indexed bibliographies are located.

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*
`physics`	`ANNOTE`	Physics
`optics`	`ANNOTE`	Optics
`acoustics`	`ANNOTE`	Acoustics
`antenna`	`ANNOTE`	Physics
`seismology`	`ANNOTE`	Geophysics
`geophysics`	`ANNOTE`	Geophysics
`astronomy`	`ANNOTE`	Astronomy
`physics /geo`	`ANNOTE`	Geophysics
`spectroscop`	`ANNOTE`	Spectroscopy
`inverse`	`ANNOTE`	Inverse problems
`nuclear`	`ANNOTE`	Physics
`particle`	`ANNOTE`	Physics
`electromagnetics`	`ANNOTE`	Electromagnetics
`engineering /radio`	`ANNOTE`	Electromagnetics
`Physic`	`JOURNAL`	Articles in physics journals
`physic`	`JOURNAL`	Articles in physics journals
`Chemi`	`JOURNAL`	Articles in chemistry journals
`chemist`	`JOURNAL`	Articles in chemistry journals
`Chimi`	`JOURNAL`	Articles in chemistry journals
`chimi`	`JOURNAL`	Articles in chemistry journals
`Astron`	`JOURNAL`	Articles in astronomy journals
`quantum computing`	`ANNOTE`	Quantum computing
`astronomy`	`ANNOTE`	Astronomy
`cosmology`	`ANNOTE`	Astronomy

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

Hint

You might also find bibliography [11] including references to chemical applications interesting.

Chapter 3

Statistical summaries

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

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

- **Acoustics** 71 references ([12]-[82])
- **Articles in astronomy journals** 58 references ([83]-[140])
- **Articles in chemistry journals** 265 references ([141]-[405])
- **Articles in physics journals** 381 references ([406]-[786])
- **Astronomy** 42 references ([787]-[828])
- **Electromagnetics** 281 references ([829]-[1109])
- **Geophysics** 102 references ([1110]-[1211])
- **Inverse problems** 62 references ([1212]-[1273])
- **Optics** 218 references ([1274]-[1491])
- **Physics** 474 references ([1492]-[1965])
- **Quantum computing** 261 references ([1966]-[2226])
- **Spectroscopy** 85 references ([2227]-[2311])

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).

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.

type	*number of items*
book	11
section of a book	2
part of a collection	50
journal article	1439
proceedings article	697
report	26
PhD thesis	41
MSc thesis	11
others	32
total	2309

Table 3.1: Distribution of publication type.

3.2 Annual distribution

Table 3.2 gives the number of genetic algorithms in physical sciences 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.

year	*items*	*year*	*items*
1970	1	1971	0
1972	0	1973	0
1974	0	1975	0
1976	1	1977	1
1978	1	1979	2
1980	1	1981	1
1982	3	1983	0
1984	0	1985	5
1986	5	1987	5
1988	2	1989	7
1990	12	1991	15
1992	34	1993	56
1994	126	1995	153
1996	231	1997	258
1998	241	1999	244
2000	252	2001	285
2002	174	2003	67
2004	38	2005	43
2006	25	2007	19
2008	1		
total			2309

Table 3.2: Annual distribution of contributions.

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.

Total	2122
engineering	466
electromagnetics	384
quantum computing	323
physics	263
optics	230
antennas	229
chemistry	144
spectroscopy	121
geophysics	103
inverse problems	75
hybrid	72
acoustics	71
astronomy	66
comparison	63
clusters	53
signal processing	46
radar	45
quantum computer	44
proteins	42
neural networks	42
medicine	38
parallel GA	35
control	34
image processing	33
evolution strategies	33
shape design	31
patent	31
seismology	30
tutorial	29
regression	29
protein folding	29
inversion problems	29
filters	29
review	28
optimization	28
popular	26
nuclear power	26
analysing GA	26
genetic programming	23
pattern recognition	22
population size	21
implementation	21
coding	21
QSAR	21
atomic clusters	20
imaging	16
wavelength selection	15
microwaves	15
lasers	15
FEM	15
crystallography	14
classification	14
chemometrics	14
CAD	14
macromolecules	13
machine learning	13
electronics	13
remote sensing	12
quantum dots	12
accelerators	12
generations	11
chemometry	11
time series	10
scheduling	10
photonic crystals	10

3.4 Authors

Table 3.4 gives the most productive authors.

total number of authors	4423
Michielssen, Eric	30
Mittra, Raj	21
Haupt, Randy L.	20
Weile, Daniel S.	18
Alander, Jarmo T.	17
Lucasius, Carlos B.	17
Rahmat-Samii, Yahya	16
Kateman, Gerrit	14
Mohammed, Osama A.	14
Buydens, Lutgarde M. C.	13
Ekert, Artur	13
Altshuler, Edward E.	12
Johnson, J. Michael	12
Linden, Derek S.	12
Charbonneau, P.	11
Fuat Üler, Gökçe	11
Chambers, B.	10
Djurišić, Aleksandra B.	10
Grover, Lov K.	10
Sambridge, Malcolm S.	10
Johnston, Roy L.	9
Nielsen, Michael A.	9
Werner, D. H.	9
Ares, F.	8
Erni, Daniel	8
Gruska, Josef	8
Hirvensalo, Mika	8
Jozsa, Richard	8
Judson, Richard S.	8
Jung, Hyun-Kyo	8
Lu, Yilong	8
Marcano, D.	8
Metcalfe, T. S.	8
Pastorino, Matteo	8
Ryynänen, Matti	8
Tennant, A.	8
Williams, Colin P.	8
Zhao, Jijun	8
Anderson, A. P.	7
Axmann, Joachim K.	7
Barenco, Adriano	7
Caorsi, Salvatore	7
Chuang, Isaac L.	7
Cirac, J. I.	7
Edwards, R. M.	7
Goodacre, Royston	7
Laflamme, R.	7
Moreno, E.	7
Russenschuck, S.	7
Wang, Guanghou	7
Willett, Peter	7
Feltus, Madeline Anne	6
Ho, K. M.	6
Hogg, Tad	6
Kennett, Brian L. N.	6
Knill, E.	6
Spühler, Michael M.	6
Stoffa, Paul L.	6
Zoller, P.	6
Altman, Zwi A.	5

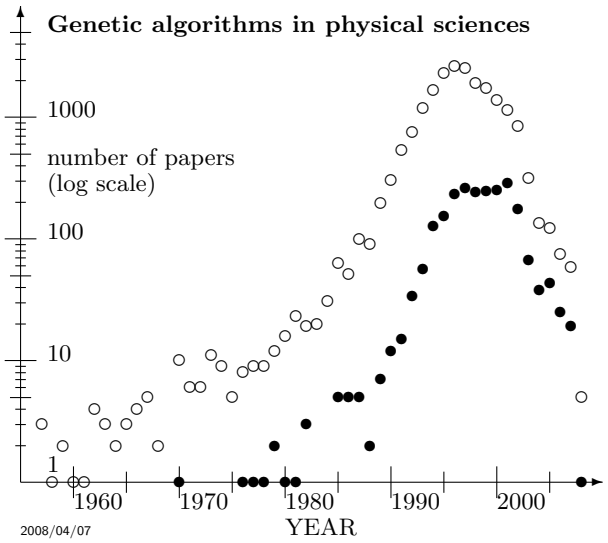

Figure 3.1: The number of papers applying **genetic algorithms in physical sciences** (•, $N = 2313$) and total GA papers (∘, $N = 20270$). Observe that the last few years are most incomplete in the database.

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.

2008/04/07	*special*		*comparison*		*all*	
country	n	%	δ[%]	Δ[%]	N	%
Total	2244	100.00			19095	100.00
United States	669	29.81	+2.05	+7	5301	27.76
United Kingdom	177	7.89	−2.42	−23	1969	10.31
Germany	134	5.97	−1.05	−15	1341	7.02
Japan	133	5.93	−6.60	−53	2393	12.53
China	122	5.44	+0.67	+14	911	4.77
Finland	103	4.59	+0.95	+26	696	3.64
Italy	80	3.57	+0.69	+24	550	2.88
France	74	3.30	+0.77	+30	484	2.53
Switzerland	47	2.09	+1.21	+138	168	0.88
Australia	43	1.92	−0.52	−21	465	2.44
The Netherlands	43	1.92	+0.89	+86	197	1.03
South Korea	41	1.83	−0.49	−21	443	2.32
Canada	36	1.60	+0.07	+5	293	1.53
Spain	33	1.47	−0.19	−11	317	1.66
Brazil	22	0.98	+0.13	+15	162	0.85
The Czech Republic	22	0.98	+0.25	+34	139	0.73
Israel	21	0.94	+0.33	+54	116	0.61
Poland	21	0.94	+0.05	+6	170	0.89
Singapore	21	0.94	+0.13	+16	155	0.81
Taiwan	21	0.94	−1.18	−56	405	2.12
Others	210	9.31	−0.00	−0	1772	9.31

Table 3.5: The geographical distribution of the authors working on genetic algorithms in physical sciences (n) compared (δ and Δ) to all authors in the field of GAs (N). In the *comparison* column: $\delta\% = \%special - \%all$ and $\Delta = (1 - \frac{nN_{Total}}{Nn_{Total}}) \times 100\%$. Δ 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 algorithms in physical sciences 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.

total 10 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.

Int. J. Imaging Syst. Technol. (USA), [1107]

Int. J. Microwave Millimeter Wave Comput. Aided Eng., [1084]

Int. J. Mod. Phys., [2028]

Int. J. Mod. Phys. C, [1994, 2211]

Int. J. Mod. Phys. C, Phys. Comput. (Singapore), [1888]

International Journal for Numerical Methods in Engineering, [18, 26]

International Journal for Numerical Methods in Fluids, [1002]

International Journal of Applied Electromagnetics and Mechanics, [838, 1024]

International Journal of Electronics, [1651]

International Journal of Geomechanics, [1199]

International Journal of Heat and Mass Transfer, [1874]

International Journal of Modern Physics A (Proc. Suppl. 2B), [744]

International Journal of Modern Physics B, [428, 681, 704]

International Journal of Modern Physics C, [438, 444, 445, 450, 461, 508, 539, 653]

International Journal of Numerical Modeling: Electronic networks, Devices and Fields, [919]

International Journal of Peptide and Protein Research, [2273]

International Journal of Plasticity, [1223]

International Journal of Quantum Chemistry, [356]

International Journal of Theoretical Physics, [577]

Internet Electronic Journal of Molecular Design, [1859]

Irish Astronomical Journal, [109, 110]

Israel Journal of Chemistry, [186]

ITG-Fachber. (Germany), [1688]

ITviikko, [2100]

J. Acoust. Soc. Jpn. (Japan), [64]

J. Beijing Univ. Aeronaut. Astronaut. (China), [120, 125, 138]

J. Biomol. Struct. Dyn., [1841]

J. Chem. Inf. Comput. Sci., [1838]

J. Chin. Soc. Mec. Eng. Trans. Chin. Inst. Eng. Ser. C, [35]

J. Comput. Acoust. (Singapore), [34, 61, 63, 65, 1256, 1208, 1209, 69]

J. Comput. Chem., [1944]

J. Geophys. Res. (USA), [823]

J. Huazhong (Cent. China), [1943]

J. Illum. Eng. Soc., [1381]

J. Jpn. Soc. Simul. Technol. (Japan), [1006]

J. Korean Nucl. Soc. (South Korea), [1782]

J. Microw. Power Electromagn. Energy (USA), [954]

J. Mod. Optics, [1993]

J. Mol. Model., [1946]

J. Phys. A, Math. Gen. (UK), [1917]

J. Phys. III, [1877]

J. Phys. III (France), [952]

J. Sound Vib. (UK), [68]

J. Synchrotron Radiat., [1940]

Japanese Journal of Applied Physics, [574, 761]

Japanese Journal of Applied Physics, Part 1, [633, 634]

Jisuanji Yu Yingyong Huaxue, [1932]

Jornal of the Acoustical Society of America, [60]

Journal of Applied Crystallography, [1867, 1882]

Journal of Applied Physics, [638]

Journal of Automata and Formal Languages, [1976]

Journal of Beijing University of Aeronautics and Astronautics, [119]

Journal of Biological and Information Processing Systems (BioSystems), [1228]

Journal of Biomolecular NMR, [2276, 2280, 2281, 2304]

Journal of Biosciences, [2004]

Journal of Chemical Physics, [226]

Journal of Chemical Information and Computer Sciences, [141, 144, 147, 153, 154, 155, 160, 163, 184, 188, 194, 199, 201, 212, 216, 218, 219, 228, 239, 252, 258, 263, 268, 271, 272, 273, 278, 285, 286, 287, 296, 304, 308, 309, 310, 313, 319, 320, 324, 326, 327, 332, 344, 351, 363]

Journal of Chemical Information and Computing Science, [338, 347]

Journal of Chemical Information and Computing Sciences, [301]

Journal of Chemical Physics, [148, 149, 152, 195, 233, 255, 269, 321, 330]

Journal of Chemical Technology and Biotechnology, [242]

Journal of Chemometrics, [2232, 2250, 2257, 2265, 2268]

Journal of Colloid and Interface Science, [1292, 1316]

Journal of Complexity, [2027]

Journal of Computational Chemistry, [181, 185, 192, 209, 211, 213, 214, 241, 256, 259, 262, 266, 267, 293, 358, 359, 365]

Journal of Computational Physics, [454, 463, 540, 548, 549]

Journal of Computer and System Sciences, [2029]

Journal of Computer-Aided Molecular Design, [2229]

Journal of Geomagnetism and Geoelectricity, [1010]

Journal of Geophysical Research, [1218, 1156, 1180]

Journal of Infrared and Millimeter Waves, [1282]

Journal of Intelligent and Fuzzy Systems, [824, 1823]

Journal of Intelligent & Fuzzy Systems, [812]

Journal of Lightwave Technology, [1337, 1360, 1367, 1372, 1262]

Journal of Magnetic Resonance, [2308, 2309]

Journal of Magnetic Resonance (Series B), [2279]

Journal of Magnetism and Magnetic Materials, [858, 862, 873, 882, 1873]

Journal of Materials Chemistry, [217]

Journal of Mathematical Chemistry, [244]

Journal of Medicinal Chemistry, [183, 187, 208, 247, 257, 280, 284, 291]

Journal of Modern Optics, [1311, 2094, 2139, 2140, 2142]

Journal of Molecular Modeling, [1852]

Journal of Molecular Structure (Theochem), [1945]

Proceedings of the Royal Society London, [2224, 2225]

Proceedings of the Royal Society of London, A, [2020, 619]

Prog. Quantum. Electron., [2171]

Prog. Theor. Phys. Suppl., [1827]

Progress in Astronautical Sciences, [107]

Progress of Theoretical Physics Supplement, [430]

Publ. Fac. Electr. Eng. Ser. Eng. Phys. (Serbia), [1426]

Publications of the Astronomical Society of the Pacific, [126]

Pure and Applied Geophysics, [1126, 1178]

Quim. Nova, [1862]

Química Nova, [2243]

Radio Science, [1574, 1708]

Railw. Gaz. Int., [1227]

Reliability Engineering & System Safety, [1787]

Rep. Math. Phys., [2036]

Reports on Progress in Physics, [690]

Rev. Mex. Fis., [1902]

Rev. Mod. Phys., [2071]

Rev. Sci. Instrum. (USA), [1442, 1446]

Review of Scientific Instruments, [1345]

Reviews of Modern Physics, [505, 545, 625]

Sci. Rep. Res. Inst., Tohoku Univ., Ser. A, [1914]

Science, [2018, 2039, 2054, 2072, 2075, 2079, 2082, 2088, 2091, 2093, 2097, 2104, 2129, 2144]

Scientific American, [2021, 2070, 2168]

Scientific Computing in Chemical Engineering, [236]

Scientific Computing World, [1275, 813]

Sensors and Actuators A: Physics, [698]

SIAM Journal on Computing, [2077, 2153]

Smart Materials and Structures, [1274]

Soc. Pet. Eng. AIME Pap. SPE, [1192]

Solid State Commun, [1900]

Spectrosc. Eur., [2288]

Speech Communications, [31]

Structural and Multidisciplinary Optimization, [1800]

Structural Engineering and Mechanics, [1219]

Superlattices and Microstructures, [1831, 1845, 2163, 2170]

SuperMenu, [1958]

Surface Science, [1901]

Surv. Geophys., [890]

T-Lehti, [2131]

Tekniikka & Talous, [2114, 2134]

The Analyst, [2262]

The Astrophysical Journal, [789, 791, 793, 800, 803, 825]

The European Physical Journal Applied Physics, [703, 717]

The European Physical Journal B, [411, 481, 742]

The European Physical Journal D, [479]

The European Physical Journal, Applied Physics, [418]

The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, [884]

The International Journal of Advanced Manufacturing Technology, [1220]

The Journal of Chemical Physics, [145, 150, 157, 165, 166, 167, 168, 170, 173, 176, 177, 224, 237, 315]

The Journal of Physical Chemistry, [353, 357]

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The Journal of the Acoustical Society of America, [1111, 13, 22, 28, 29, 33, 47, 53, 54, 58, 59, 66, 70, 71, 73, 80]

The Sciences, [2223]

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Transactions of Nanjing University of Aeronautics and Astronautics, [100, 123, 124]

Transactions of the American Nuclear Society, [1741, 1745, 1779, 1780]

Transactions of the Institute of Electrical Engineers of Japan C, [1229, 1011]

Trends in Analytical Chemistry, [312, 337, 361]

Ultramicroscopy, [1285]

Ultrasonics, [27, 74]

VHF Communications, [1646]

Vibrational Spectroscopy, [2245]

Vistas in Astronomy, [106]

Water Resources Bulletin, [1191]

Water Resources Research, [1112, 1114, 1117, 1121, 1145, 1155, 1160, 1185]

Wirel. Pers. Commun. (Netherlands), [1064]

Wuli Huaxue Xuebao, [1926]

X-ray Spectrometry, [2267]

Zeitschrift für Angewandte Mathematik und Mechanik, [1961]

Zeitschrift für Kristallographie, [1911]

Zeitschrift für Naturforschung, [2098]

total 1440 articles in 529 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

Arizona State University, [878]

Brown University, [2228]

Catholic University of Nijmegen, [2292]

Colorado State University, [1157]

Cornell University, [815]

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McGill University, [2306]

North Carolina State University, [2247]

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Rijksuniversiteit Groningen, [2238]

State University of New York at Buffalo, [1868]

Swedish University of Agricultural Sciences, [2254]

The Pennsylvania State University, [1184]

The University of Manitoba, [2244]

The University of Texas at Arlington, [1463]

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University of Alabama in Huntsville, [1281]

University of Durham, [1235]

University of Florida, [1312, 1924]

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University of Tennessee, [1792]

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4.3.2 Master's theses

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FU Berlin, [1188]

Helsinki University of Technology, [2074, 24, 2132, 1587]

Technical University of Vienna, [1966, 2161]

University of Dortmund, [1963]

University of Genova?, [1043]

University of Illinois at Urbana-Champaign, [1604]

University of Turku, [2158]

total 11 thesis in 7 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.

Helsinki University of Technology, [1044, 1898]

INRIA, [1266, 1270]

Institute of Naval Medicine, [1484]

Kernforschungsanlage Karlsruhe, [1793]

NASA, [1368]

NSF-ITP, [2151]

Naval Ocean Systems Center, [76]

Ochanomizu University, [1774]

Ruhr Universität Mannheim, [1826]

TUCS, [1987]

University of Bristol, [1975]

University of Exeter, [2146]

University of Illinois, [1476]

University of Joensuu, [808]

University of Vaasa, [82, 828, 1964, 1735, 1273, 1489, 1965, 2226]

VTT Automation, [950]

Xerox, [2164]

total 26 reports in 17 institutes

4.5 Patents

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

Acoustical treatment with diffusive and absorptive properties and process of design, [14]

Analysis method of reflection characteristic of reflecting plate, and computer-readable recording medium with the analysis program recorded theorem, [1336]

Computer for a quantum computer, [2092]

Designs for wide band antennas with parasitic elements and a method to optimize their design using a genetic algorithm and fast integral equation technique, [1576]

Directionally compositing method for conformal array antenna and medium storing the method, [1693]

Element thinning method of array antenna and storage medium recording element thinning program of array antenna, [1575]

General purpose quantum computing, [1441, 1461]

Imaging system component design, [1324]

Manufacture of multilayer film filter utilizing genetic algorithm, [1298]

Method and apparatus for analysing optical parameters, [1402]

Method and apparatus for preforming mutations in a genetic algorithm-based underwater tracking system, [62]

Method and hardware architecture for controlling a process or for processing data based on quantum soft computing, [2046]

Method for creation of planar or complex wavefronts in close proximity to a trasmitter array, [1541]

Method for designing refractive index modulation type phase element, [1468]

Method for nonlinear optimization for gas tagging and other systems, [1781]

Method for the positioning of electromagnetic sensors or transmitters in an array, [1502]

Method of arranging magnet, [887]

Method of determining movement sequence, alignment apparatus , method and apparatus of designing optical system, and medium in which program realizing the designing method, [1320]

Method of making a universal quantum dot logic cell, [2145]

Methods for allocating channels in a radio network using a genetic algorithm, [1096]

Nuclear magnetic resonance quantum computing method with improved solvents, [2025]

Operation method for genetic algorithm and method for manufacturing multi-layer film light filter using the same, [1326]

Process for determining the value of a physical parameter, [1906]

Process for the design of antennas using genetic algorithms, [1679]

Quantum dot-tunnel device and information processing apparatus and method using same, [2157]

Seabed sedimentary layer parameter estimation device using genetic algorithm, [1123]

Seabed sedimentary layer parameter-estimating device using genetic algorithm, [1133]

System and method for control using quantum soft computing, [2055]

Systematic wavelength selection for improved multivariate spectral analysis, [2274]

Universal quantum dot logic cell, [2167]

total 30 patents

4.6 Authors

The following list contains all genetic algorithms in physical sciences authors and references to their known contributions.

total 2299 articles by 4423 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

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- Pakistan: [1313]

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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 Technology Index, EI = The Engineering Index (A = Annual, M = Monthly), DAI = Dissertation Abstracts International, P = Index to Scientific & Technical Proceedings, PA = Physics Abstracts, PubMed = National Library of Medicine, BackBib = Thomas Bäck's unpublished bibliography, Fogel/Bib = David Fogel's EA bibliography, etc
* = only abstract seen.
? = data of this field is missing (BiBTeX-format).

The last field in each reference item in `Teletype` font is the BiBTEXkey of the corresponding reference.

Appendix A

Bibliography entry formats

This documentation was prepared with LaTeX and reproduced from camera-ready copy supplied by the editor. The ones who are familiar with BibTeX may have noticed that the references are printed using `abbrv` bibliography style and have no difficulties in interpreting the entries. For those not so familiar with BibTeX are given the following formats of the most common entry types. The optional fields are enclosed by "[ ]" in the format description. Unknown fields are shown by "?". † after the entry means that neither the article nor the abstract of the article was available for reviewing and so the reference entry and/or its indexing may be more or less incomplete.
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.

Vaasa Genetic Algorithm Bibliography

Search & Optimise

Main features:

- **Over 20,000 references to published papers**
- **by over 20,000 researchers.**
- **Available as over 70 special bibliographies online:** `ftp://ftp.uwasa.fi/cs/report94-1/ga*bib.pdf` **files.**
- **Covers all sciences and engineering fields, from basic theory to applications.**
- **Several indexes and statistical summaries.**
- **See what problems evolution can solve for you!**

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.

Observe that our server has also a selection of our papers on genetic algorithms and other compuational topics. See our bibliographies or file `ftp.uwasa.fi/cs/README` for further details.

file	# refs	*updated*	*contents*
ga90bib.ps.Z			GA in 1990
⋮	⋮	⋮	⋮
ga02bib.ps.Z	557		GA in 2002
gaACOUSTICSbib.pdf	181	2008/03/19	GA in acoustics (**new: March 2008**)
gaAIbib.pdf	2402	2007/11/01	GA in artificial intelligence
gaAERObib.pdf	784	2004/06/01	GA in aerospace
gaAGRObib.pdf	102	2006/02/06	GA in agriculture (**new**)
gaALIFEbib.pdf	171	2003/07/09	GA in artificial life
gaARTbib.pdf	142	2003/07/09	GA in art and music
gaAUSbib.pdf	634	2003/07/09	GA in Australia and New Zealand
gaBASICSbib.pdf	997	2007/08/23	Basics of GA
gaBIObib.pdf	1197	2005/12/03	GA in biosciences including medicine
gaCADbib.pdf	1153	2003/07/09	GA in Computer Aided Design
gaCHEMbib.pdf	886	2004/09/20	GA in chemical sciences ; previously in gaCHEMPHYSbib.ps.Z
gaCHEMPHYSbib.ps.Z	2277		GA in chemistry and physics; divided into gaCHEMbib.ps.Z and gaPHY
gaCIVILbib.pdf	1007	2008/03/20	GA in civil, structural, and mechanical engineering
gaCODEbib.pdf	377	2008/03/20	GA coding
gaCOEVObib.ps.Z	220	2006/03/27	co- and differential evolution GA(**new**)
gaCONTROLbib.ps.Z	1766	2008/03/12	GA in control and process engineering
gaCSbib.ps.Z	1453	2008/03/20	GA in comp. sci. (incl. databases, /mining, software testing and GP)
gaEARLYbib.ps.Z	723	2008/03/12	GA in yearly yeas (upto 1989) **new**
gaEAST-EURObib.ps.Z	679	2003/07/09	GA in the Eastern Europe
gaECObib.ps.Z	1503	2008/03/20	GA in economics and finance
gaELMAbib.ps.Z	481	2008/03/20	GA in electromagnetics
gaESbib.ps.Z	464	2008/03/20	Evolution strategies
gaFAR-EASTbib.ps.Z	2066	2003/07/09	GA in the Far East (excl. Japan)
gaFRAbib.ps.Z	462	2003/07/09	GA in France
gaFTPbib.ps.Z	1353	2003/07/09	GA papers available via web (ftp and www)
gaFUZZYbib.ps.Z	1453	2008/03/11	GA and fuzzy logic
gaGEObib.ps.Z	312	2005/06/30	GA in geosciences
gaGERbib.ps.Z	1586	2004/09/22	GA in Germany, Austria, and Switzerland
gaGPbib.ps.Z	955	2008/03/12	genetic programming
gaIMPLEbib.ps.Z	1291	2003/07/09	implementations of GA
gaINDIAbib.ps.Z	276	2003/05/23	GA in India
gaINVERSEbib.ps.Z	231	2007/08/22	GA in inverse problems (**new: Aug 2007**)
gaISbib.ps.Z	81	2007/11/01	immune systems
gaJAPANbib.ps.Z	2343	2003/07/09	GA in Japan
gaLCSbib.ps.Z	210	2007/11/02	Learning Classifier Systems
gaLASERbib.ps.Z	55	2008/04/03	GA and lasers (**new: April 2008**)
gaLATINbib.ps.Z	649	2003/07/09	GA in Latin America, Portugal & Spain
gaLOGISTICSbib.ps.Z	630	2003/07/09	GA in logistics (incl. TSP)
gaMANUbib.ps.Z			GA in manufacturing
gaMATHbib.ps.Z	770	2003/07/09	GA in mathematics
gaMEDICINEbib.ps.Z	473	2007/11/27	GA in medicine (**new: Nov 2007**)
gaMEDITERbib.ps.Z	1810	2003/07/09	GA in the Mediterranean
gaMICRObib.ps.Z	83	2008/03/31	GA in microscopy & microsystems (**new: March 2008**) gaMILbib.ps
111	2005/01/25	GA in military applications	
gaMLbib.ps.Z	897	2007/11/02	GA in machine learning **new**
gaMSEbib.ps.Z	546	2007/06/28	GA in materials **new**
gaNANObib.ps.Z	109	2008/04/07	GA in nanotechnology **new**
gaNIRbib.ps.Z	163	2007/08/23	GA in NIRS (spectroscopy) **new**
gaNNbib.ps.Z	1800	2008/03/12	GA in neural networks
gaNORDICbib.ps.Z	933	2007/12/20	GA in Nordic countries
gaOPTICSbib.ps.Z	1571	2007/08/23	GA in optics and image processing
gaOPTIMIbib.ps.Z	923	2003/07/09	GA and optimization (only a few refs)
gaORbib.ps.Z	1575	2003/07/09	GA in operations research

...table continues on the next page...

file	# refs	*updated*	*contents*
`gaPARAbib.ps.Z`	766	2003/12/16	Parallel and distributed GA
`gaPARETObib.ps.Z`	406	2003/07/09	Pareto optimization
`gaPATENTbib.ps.Z`	458	2003/07/09	GA patents
`gaPATTERNbib.ps.Z`	1528	2007/11/06	GA in pattern recognition incl. LCS (**new**)
`gaPHYSbib.ps.Z`	2313	2008/04/07	GA in physical sciences ; previously in `gaCHEMPHYSbib.ps.Z`
`gaPIEZObib.ps.Z`	51	2008/03/26	GA & piezo (**new: March 2008)**
`gaPOWERbib.ps.Z`	914	2004/01/19	GA in power engineering
`gaPROTEINbib.ps.Z`	491	2008/03/12	GA in protein research
`gaQCbib.ps.Z`	539	2008/03/11	quantum computing
`gaROBOTbib.ps.Z`	745	2007/11/01	GA in robotics
`gaSAbib.ps.Z`	307	2003/07/09	GA and simulated annealing
`gaSCHEDULINGbib.ps.Z`	785	2006/09/06	GA in scheduling
`gaSELECTIONbib.ps.Z`	273	2007/09/20	Selection in GAs (**new**)
`gaSIGNALbib.ps.Z`	2230	2008/03/11	GA in signal and image processing
`gaSIMULAbib.ps.Z`	939	2003/07/09	GA in simulation
`gaTELEbib.ps.Z`	784	2004/02/26	GA in telecom
`gaTHEORYbib.ps.Z`	2334	2005/01/21	Theory and analysis of GA
`gaTHESESbib.ps.Z`	556	2008/03/12	PhD etc theses
`gaUKbib.ps.Z`	1907	2003/07/09	GA in United Kingdom
`gaVLSIbib.ps.Z`	806	2008/04/07	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`. New updates also as `.pdf` files.