An Indexed Bibliography of Learning Classifier Systems

compiled by

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Dedicated to Pier Luca Lanzi

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DRAFT September 29, 1999

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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 (September 29, 1999) contained 11449 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 have been used systematically


1.1 Your contributions erroneous or missing?

The bibliography database is updated on a regular basis and certainly contains many errors and inconsistencies. 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 learning classifier systems 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:

```latex
@TECHREPORT{galCSbib,
  KEY = "LCS",
  ANNOTE = "*on,*FIN.bibliography /special",
  AUTHOR = "Jarmo T. Alander",
  TITLE = "Indexed Bibliography of Learning Classifier Systems",
  INSTITUTION = "University of Vasa, Department of Information Technology and Production Economics",
  TYPE = "Report",
  NUMBER = "94-i-LCS",
  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 subbibilographies.

1.2 How to get this report via Internet?

Versions of this bibliography are available via anonymous ftp and www from the following sites:

<table>
<thead>
<tr>
<th>media</th>
<th>country</th>
<th>site</th>
<th>directory</th>
<th>file</th>
</tr>
</thead>
<tbody>
<tr>
<td>ftp</td>
<td>Finland</td>
<td>ftp.uwasa.fi</td>
<td>/cs/report94-1</td>
<td>galCSbib.ps.Z</td>
</tr>
<tr>
<td>www</td>
<td>Finland</td>
<td><a href="http://www.cs.hut.fi/~ja/galCSbib">http://www.cs.hut.fi/~ja/galCSbib</a></td>
<td>galCSbib.html</td>
<td></td>
</tr>
</tbody>
</table>

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 BiBTeX documents 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 1.1. 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 learning classifier systems literature. At least the following GA researchers have already kindly supplied their complete autobiographies 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, Joachim Born, Ralf Bruns, I. L. Bukatova, Thomas Bäck, David E. Clark, Carlos A. Coello Coello, Yuval Davidor, Dipankar Dasgupta, Marco Dorigo, J. Wayland Eheart, Bogdan Filipic, 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, Mark
<table>
<thead>
<tr>
<th>file</th>
<th>contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ga90bib.ps.Z</td>
<td>GA in 1990</td>
</tr>
<tr>
<td>ga91bib.ps.Z</td>
<td>GA in 1991</td>
</tr>
<tr>
<td>ga92bib.ps.Z</td>
<td>GA in 1992</td>
</tr>
<tr>
<td>ga93bib.ps.Z</td>
<td>GA in 1993</td>
</tr>
<tr>
<td>ga94bib.ps.Z</td>
<td>GA in 1994</td>
</tr>
<tr>
<td>ga95bib.ps.Z</td>
<td>GA in 1995</td>
</tr>
<tr>
<td>ga96bib.ps.Z</td>
<td>GA in 1996</td>
</tr>
<tr>
<td>ga97bib.ps.Z</td>
<td>GA in 1997</td>
</tr>
<tr>
<td>ga98bib.ps.Z</td>
<td>GA in 1998</td>
</tr>
<tr>
<td>gaAIBib.ps.Z</td>
<td>GA in artificial intelligence</td>
</tr>
<tr>
<td>gaALIFEbib.ps.Z</td>
<td>GA in artificial life</td>
</tr>
<tr>
<td>gaARTbib.ps.Z</td>
<td>GA in art and music</td>
</tr>
<tr>
<td>gaAUSBib.ps.Z</td>
<td>GA in Australia</td>
</tr>
<tr>
<td>gaBASICSbib.ps.Z</td>
<td>Basics of GA</td>
</tr>
<tr>
<td>gaBIObib.ps.Z</td>
<td>GA in biosciences including medicine</td>
</tr>
<tr>
<td>gaCADDbib.ps.Z</td>
<td>GA in Computer Aided Design</td>
</tr>
<tr>
<td>gaCHEM PHYSbib.ps.Z</td>
<td>GA in chemistry and physics</td>
</tr>
<tr>
<td>gaCONTRULbib.ps.Z</td>
<td>GA in control</td>
</tr>
<tr>
<td>gaCSbib.ps.Z</td>
<td>GA in computer science (incl. databases and GP)</td>
</tr>
<tr>
<td>gaDBbib.ps.Z</td>
<td>GA in databases</td>
</tr>
<tr>
<td>gaECObib.ps.Z</td>
<td>GA in economics and finance</td>
</tr>
<tr>
<td>gaENGbib.ps.Z</td>
<td>GA in engineering</td>
</tr>
<tr>
<td>gaESbib.ps.Z</td>
<td>Evolution strategies</td>
</tr>
<tr>
<td>gaFAREASTbib.ps.Z</td>
<td>GA in the Far East (Japan etc)</td>
</tr>
<tr>
<td>gaFRAbib.ps.Z</td>
<td>GA in France</td>
</tr>
<tr>
<td>gaFTPbib.ps.Z</td>
<td>GA papers available via ftp</td>
</tr>
<tr>
<td>gaFUZZYbib.ps.Z</td>
<td>GA and fuzzy logic</td>
</tr>
<tr>
<td>gaGERbib.ps.Z</td>
<td>GA in Germany</td>
</tr>
<tr>
<td>gaGPbib.ps.Z</td>
<td>Genetic programming</td>
</tr>
<tr>
<td>gaIMPLEbib.ps.Z</td>
<td>Implementations of GA</td>
</tr>
<tr>
<td>gaISbib.ps.Z</td>
<td>Immune systems</td>
</tr>
<tr>
<td>gaJOURNAlbib.ps.Z</td>
<td>Journal articles</td>
</tr>
<tr>
<td>gaLATINbib.ps.Z</td>
<td>GA in Latin America, Portugal &amp; Spain</td>
</tr>
<tr>
<td>gaLOGISTICSbib.ps.Z</td>
<td>GA in logistics</td>
</tr>
<tr>
<td>gaMANUbib.ps.Z</td>
<td>GA in manufacturing</td>
</tr>
<tr>
<td>gaMEDITERbib.ps.Z</td>
<td>GA in the Mediterranean</td>
</tr>
<tr>
<td>gaNNbib.ps.Z</td>
<td>GA in neural networks</td>
</tr>
<tr>
<td>gaNORDICbib.ps.Z</td>
<td>GA in Nordic countries</td>
</tr>
<tr>
<td>gaOPTIMbib.ps.Z</td>
<td>GA and optimization (only a few refs)</td>
</tr>
<tr>
<td>gaOPTICSbib.ps.Z</td>
<td>GA in optics and image processing</td>
</tr>
<tr>
<td>gaORbib.ps.Z</td>
<td>GA in operations research</td>
</tr>
<tr>
<td>gaPARRbib.ps.Z</td>
<td>Parallel and distributed GA</td>
</tr>
<tr>
<td>gaPOWERbib.ps.Z</td>
<td>GA in power engineering</td>
</tr>
<tr>
<td>gaPROTEINbib.ps.Z</td>
<td>GA in protein research</td>
</tr>
<tr>
<td>gaRQbib.ps.Z</td>
<td>GA in robotics</td>
</tr>
<tr>
<td>gaSAbib.ps.Z</td>
<td>GA and simulated annealing</td>
</tr>
<tr>
<td>gaSIGNALbib.ps.Z</td>
<td>GA in signal and image processing</td>
</tr>
<tr>
<td>gaTHEORYbib.ps.Z</td>
<td>Theory and analysis of GA</td>
</tr>
<tr>
<td>gaTOP10bib.ps.Z</td>
<td>Authors having at least 10 GA papers</td>
</tr>
<tr>
<td>gaUKbib.ps.Z</td>
<td>GA in United Kingdom</td>
</tr>
<tr>
<td>gaVLSIbib.ps.Z</td>
<td>GA in VLSI design and testing</td>
</tr>
</tbody>
</table>

Table 1.1: Indexed GA subbibliographies in directory ftp.uwasa.fi/ca/report94-1.

The editor also wants to acknowledge Elizabeth Heap-Talvez for her kind proofreading of the manuscript of this bibliography.
Chapter 2

Introduction

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 [7] have been implemented by the author mainly as sets of simple awk and gawk programs [8, 9].

<table>
<thead>
<tr>
<th>string</th>
<th>field</th>
<th>class</th>
</tr>
</thead>
<tbody>
<tr>
<td>classifier system</td>
<td>ANNOTE</td>
<td>Classifier systems</td>
</tr>
<tr>
<td>bucket brigade</td>
<td>ANNOTE</td>
<td>Classifier systems</td>
</tr>
</tbody>
</table>

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 learning classifier systems literature. More detailed indexes can be found in the next chapter.

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

- **Classifier systems** 172 references ([10]-[181])

  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; query order 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.

<table>
<thead>
<tr>
<th>type</th>
<th>number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>book</td>
<td>1</td>
</tr>
<tr>
<td>section of a book</td>
<td>2</td>
</tr>
<tr>
<td>part of a collection</td>
<td>5</td>
</tr>
<tr>
<td>journal article</td>
<td>35</td>
</tr>
<tr>
<td>proceedings article</td>
<td>110</td>
</tr>
<tr>
<td>report</td>
<td>11</td>
</tr>
<tr>
<td>PhD thesis</td>
<td>6</td>
</tr>
<tr>
<td>MSc thesis</td>
<td>1</td>
</tr>
<tr>
<td>others</td>
<td>1</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>172</strong></td>
</tr>
</tbody>
</table>

Table 3.1: Distribution of publication type.

### 3.2 Annual distribution

Table 3.2 gives the number of learning classifier systems 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 almost the last twenty years.

| year | items | year | items |
|------|-------|      |-------|
| 1981 | 1     | 1982 | 0     |
| 1983 | 0     | 1984 | 1     |
| 1985 | 4     | 1986 | 4     |
| 1987 | 7     | 1988 | 10    |
| 1989 | 17    | 1990 | 10    |
| 1991 | 20    | 1992 | 13    |
| 1993 | 14    | 1994 | 30    |
| 1995 | 17    | 1996 | 14    |
| 1997 | 7     | 1998 | 3     |
| **total** | **172** |

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.

<table>
<thead>
<tr>
<th>classifier systems</th>
<th>158</th>
</tr>
</thead>
<tbody>
<tr>
<td>machine learning</td>
<td>16</td>
</tr>
<tr>
<td>others</td>
<td>317</td>
</tr>
</tbody>
</table>

Table 3.3: The most popular subjects.
3.4 Authors

Table 3.4 gives the most productive authors.

<table>
<thead>
<tr>
<th>Authors</th>
<th>PAPERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goldberg, David E.</td>
<td>11</td>
</tr>
<tr>
<td>Fogarty, Terence C.</td>
<td>10</td>
</tr>
<tr>
<td>2 authors</td>
<td>9</td>
</tr>
<tr>
<td>2 authors</td>
<td>8</td>
</tr>
<tr>
<td>2 authors</td>
<td>7</td>
</tr>
<tr>
<td>2 authors</td>
<td>6</td>
</tr>
<tr>
<td>1 author</td>
<td>5</td>
</tr>
<tr>
<td>5 authors</td>
<td>4</td>
</tr>
<tr>
<td>16 authors</td>
<td>3</td>
</tr>
<tr>
<td>20 authors</td>
<td>2</td>
</tr>
<tr>
<td>113 authors</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3.4: The most productive learning classifier systems authors.

3.5 Geographical distribution

The following table gives the geographical distribution of authors, when the country of the author was known. Over 80% of the references of the source database are classified by country.

<table>
<thead>
<tr>
<th>country</th>
<th>abs</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>172</td>
<td>100.00</td>
</tr>
<tr>
<td>United States</td>
<td>80</td>
<td>46.51</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>22</td>
<td>12.79</td>
</tr>
<tr>
<td>Unknown country</td>
<td>21</td>
<td>12.21</td>
</tr>
<tr>
<td>Japan</td>
<td>13</td>
<td>7.56</td>
</tr>
<tr>
<td>France</td>
<td>8</td>
<td>4.65</td>
</tr>
<tr>
<td>Italy</td>
<td>6</td>
<td>3.49</td>
</tr>
<tr>
<td>Germany (incl. DDR)</td>
<td>4</td>
<td>2.33</td>
</tr>
<tr>
<td>Canada</td>
<td>3</td>
<td>1.74</td>
</tr>
<tr>
<td>Austria</td>
<td>2</td>
<td>1.16</td>
</tr>
<tr>
<td>Belgium</td>
<td>2</td>
<td>1.16</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>2</td>
<td>1.16</td>
</tr>
<tr>
<td>Cyprus</td>
<td>1</td>
<td>0.58</td>
</tr>
<tr>
<td>Denmark</td>
<td>1</td>
<td>0.58</td>
</tr>
<tr>
<td>Greece</td>
<td>1</td>
<td>0.58</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>0.58</td>
</tr>
<tr>
<td>Poland</td>
<td>1</td>
<td>0.58</td>
</tr>
<tr>
<td>Romania</td>
<td>1</td>
<td>0.58</td>
</tr>
<tr>
<td>Spain</td>
<td>1</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Table 3.5: The geographical distribution of the authors. Observe that joint papers may have authors from several countries. This decreases the unknown country count (=all-known countries).
3.6 Conclusions and future

The editor believes that this bibliography contains references to most learning classifier systems contributions up to 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.

Parallelism and Programming in Classifier Systems, [115]

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.

AI Communications, [33]
AISB Quarterly, [45]
Analytica Chimica Acta, [84]
APL Quote Quad, [50, 70]
Applied Artificial Intelligence, [126]
Artificial Intelligence, [85, 92]
Complex Systems, [163]
Computers & Operations Research, [19]
Design Theory and Methodology, [149]
European Journal of Operational Research, [87]
Evolutionary Computation, [34, 46]
Expert Systems, [40]
IEEE Transactions on Systems, Man, and Cybernetics, [50, 106]
IEEE Transactions on Fundamentals of Electronics Communications and Computer Sciences, [178]
Intelligent Systems Engineering, [137]
International Journal of Intelligent Systems, [75, 143]
Irish Journal of Psychology, [88]
Jpn. J. Fuzzy Theory Syst. (USA), [49, 71]
Machine Learning, [58, 91, 102, 111, 118, 157, 158, 161]
Mathematical and Computer Modelling, [171]
Nippon Kikai Gakkai Ronbunshu C Hen, [139]
Pattern Recognition, [17]
total 35 articles in 22 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
Katholieke Universiteit Nijmegen, [79]
Stanford University, [56]
University of Alabama, [151, 181]
University of Michigan, [117, 155]
total 6 theses in 4 schools

4.3.2 Master’s theses
This list includes also “Diplomarbeite”, “Tech. Lic. Theses”, etc.

University of Tennessee, [140]

11
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.

Aarhus University, [18]
Los Alamos National Laboratory, [112, 113, 116]
Politecnico di Milano, [105]
The Rowland Institute for Science, [159, 160]
University of Illinois at Urbana-Champaign, [39, 124]
University of Michigan, [130, 152]

total 11 reports in 6 institutes

4.5 Patents

The following list contains the names of the patents of learning classifier systems. The list is arranged in alphabetical order by the name of the patent.

Method of controlling a classifier system, [134]
4.6 Authors

The following list contains all learning classifier systems authors and references to their known contributions.

Andrey, Philippe, [17]
Arentoft, Peter Roåann, [18]
Aurand, Jean-Philippe, [22]
Aytug, Haldun, [19]
Barry, A. M., [88]
Belen, Richard K., [111]
Borini, Hugues, [38]
Bharadwaj, K. K., [75]
Bekas, K., [87]
Bonelli, Pierre, [89, 90]
Booker, Lashon B., [91, 92, 93, 94, 95, 127]
Brown, W., [82]
Bull, Lawrence, [20, 36, 45, 47, 63, 64]
Bullock, J., [82]
Burns, A. W., [134]
Baydens, Lutgarde M. C., [84]
Carroll, C. C., [122]
Carré, Brian, [21, 37, 41, 44, 45, 63, 65, 77]
Chai, R., [172]
Chalk, K., [78]
Cichog, P., [57]
Collard, Philippe, [22, 48, 96]
Companini, M., [97, 98, 99, 100]
Cribbs III, H. Brown, [66]
Crowley, Philip H., [81]
Davis, Lawrence, [101, 102]
Deb, Kalyanmoy, [39, 46, 124]
Donnart, Jean-Yves, [23]
Dorigo, Marco, [38, 58, 10, 103, 104, 105, 106]
Dumier, Raoul, [107]
Dwormann, Garette, [24]
Endoh, Satoshi, [67]
Escazú, Cathy, [22, 48]
Fairley, Andrew, [25, 35, 108]
Fellrath, Paul, [40]
Finnerty, S., [26]
Fogarty, Terence C., [20, 36, 37, 45, 47, 63, 64, 65, 77, 109]
Forrest, Stephanie, [110, 111, 112, 113, 114, 115, 116, 117]
Frey, P. W., [118]
Furuhashi, Takeshi, [32, 49, 179]
Furuhashi, T., [71]
Gell-Mann, Murray, [27, 68]
Geyer-Schulz, Andreas, [90]
Glesner, Manfred, [51]
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4.7 Subject index

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agents, [64, 78] convergence, [29] credit, [10]
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analysing GA, [79] credit allocation, [162, 164] portfolio management, [175]
animals, [23] emergency, [88] engineering, [128]
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Boolean functions, [159] parallel, [20] fault diagnosis, [137]
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CAD classifier, [32]
optimization, [149] genetic programming, [62]
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CFS-C, [152] hierarchies, [169]
chemistry simulated annealing, [26, 79] human learning modeling, [154]
analytical, [84] comparisons image processing, [173]
structural, [79] classifier, [38] quantization, [52]
chromatography, [84] complex systems, [27, 68] segmentation, [17]
classification, [26, 59, 76] comparisons implementation, [152]
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bucket brigade, [75] control, [109] iterated prisoner's dilemma, [78]
classifier systems classifier systems, [98] knowledge-based systems, [33] learning, [178]
APL, [50] machine learning, [103, 145, 105, 175, 106, 19, 25, 28, 30, 38, 44, 53, 72, 76, 87]
applications, [82] machine learning
classification to Q-learning, [38] critics manufacturing
makers, [89]
electromyography, [145] robotics control, [53, 58] dynamic, [19]
mining mobile, [96] sequence of classifiers, [13]
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routing, [77] telecommunications
NEWBOOLE, [76]
parallel GA, [147, 17, 54] robots, [47]
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### 4.8 Annual index

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4.9 Geographical index

The following table gives references to the contributions by country.

- Austria: [50, 70]
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- India: [75]
- Italy: [10, 103, 104, 105, 106, 58]
- Japan: [147, 175, 139, 148, 179, 31, 33, 49, 55, 59, 67, 71, 80]
- Poland: [57]
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- United Kingdom: [88, 108, 109, 119, 137, 20, 25, 29, 35, 37, 41, 44, 45, 47, 63, 64, 65, 77, 78, 82, 86]
- Unknown country: [81, 83]
## Chapter 5

### Permutated title index

The words of the titles of the articles are shown in the next table arranged in alphabetical order. The most common words have been excluded. The key word is shown by a disk (●) in the title field with the exception that it is omitted when appearing as the first word of the title after shown keyword. The other abbreviation used to compress titles are shown in appendix A.

| [165] abstract | CS mapping of real vectors | extended ● |
| [166] toward a GA solution of the discovery problem | extended ● |
| [32] acquisition | A study on apportionment of credits of fuzzy classifier syst. for knowledge ● of large scale syst. |
| [176] ACS | Impl. of GA based associative classifier syst. ● |
| [80] adaptation | Showing the way: a review of the second edition of Holland’s ● in Nat. and Artificial Syst. |
| [23] adaptive | A hierarchical classifier syst. implementing a motivationally autonomous ● animat |
| [175] applying ● credit assignment alg. for the learning classifier syst. based upon the GA |
| [71] apportionment | A proposal on payoffs and ● of credits of fuzzy classifier syst. - Finding of knowledge for large scale syst. |
| [32] a study on ● of credits of fuzzy classifier syst. for knowledge acquisition of large scale syst. |
| [10] message-based bucket brigade: An alg. for the ● of credit problem |
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| [86] artificial | Showing the way: a review of the second edition of Holland’s Adaptation in Nat. and Syst. |
| [141] assignment | Alternatives for classifier syst. credit ● |
| [175] applying adaptive credit ● alg. for the learning classifier syst. based upon the GA |
| [143] - Credit ● and discovery in classifier syst. |
| [177] - Credit ● for pole balancing with learning CSs |
| [176] associative | Impl. of GA based ● classifier syst. (ACS) |
| [94] attribute-based | Representing ● concepts in a CS |
| [138] automation | and opt. of froth flotation |
| [23] autonomous | A hierarchical classifier syst. implementing a motivationally ● adaptive animat |
| [87] - vehicle navigation using evol. reinforcement learning |
| [139] - Study on an ● robot navigation problem using a CS |
| [106] autonomous | Alcyons and the ● Learning to cntr. a Real Robot by Distr. CSs |
| [58] - Alcyons and the ● learning to cntr. a real robot by distr. classifier syst. |
| [53] autotuning | Run-time ● of a robot cntr. using a gen. based ML cntr. scheme |
| [90] back | specialization with the bucket brigade alg. |
| [177] balancing | Credit assignment for pole ● with learning CSs |
| [18] baseret | Simuleret skovbrandsbekæmpelse - et eksempel på genetisk ● maskinindlæring [Simulated forest fire fights - an example of gen. based machine learning] |
| [107] behavior | Extended classifiers for simulation of adaptive ● |
| [171] - Short-term prediction of Int. ● using a Holland classifier |
| [95] behavioral | Instinct as an inductive bias for learning ● sequences |
| [114] behaviour | Emergent ● in classifier syst. |
| [106] - Gen. based machine learning and ● based robotics: A new synthesis |
| [41] 44 | - Learning anticipatory ● using a delayed action classifier syst. |
| [103] organization of robot ● through gen. learning process |
generates A fuzzy classifier syst. that • fuzzy if-then rules for pattern classification problems. 

Generating rules using a Holland based classifier learning syst.

generation Geometric Rep. for shape using classifier syst.

Genetic-based A distr. computational environment for CSs

genetics Run-time autotuning of a robot cntr. using a based ML cntr. scheme

Genetics-based machine learning and behavior based robotics: A new synthesis

Genetics-based-machine-learning in clinical electromography

GeneSimulate skovbrandbekæmpelse • et eksensel på • baseret maskindling [Simulated forest fire fights • an example of gen. based machine learning]


goal Learning the • relevance of actions in classifier syst.

Hammern Classifier syst. with • weights

Hard What makes a problem • for a classifier syst.?

HCS Adding Hierarchies to CSS

Hierarchical A • classifier syst. implementing a motivationally autonomous adaptive animal

• Bucket brigade alg. for • censored production rule-based syst.

Hierarchically Extension of CS using self GA invocation

Hierarchies Bucket brigade perf.: II. Default •

Hierarchical • Empirical studies of default • and sequences of rules in learning classifier syst.

HCS: Adding to CSS

Here new perspectives about default • formation in learning classifier syst.

Hierarchy Default • formation and memory exploitation in learning classifier syst.

Hierarchical • Reinforcement learning with classifier syst.: Adaptive default • formation

Holland Generating rules using a • based classifier learning syst.

Holland classifier syst.

Holland Short-term prediction of Int. behavior using a classifier syst.

Holland’s Showing the way: a review of the second edition of • Adaptation in Nat. and Artificial Syst.

Holland-style Letter recognition using • adaptive classifiers

Hot A practical appl. of a learning CS in a steel • strip mill

Human Modeling Simple • Category Learning with a CSS

Modeling • categorization by a simple classifier syst.

Hybrid Inductive operators and rule repair in a • gen. learning syst.: some initial results

Hy-then rules for investment advising

If-then rules A fuzzy classifier syst. that generates fuzzy • for pattern classification problems

Image Adaptive • quantization based on learning classifier syst.

Image segmentation Unsupervised • using a distr. GA

Implement Using classifier syst. to • distr. Rep.

Implementation of GA based associative classifier syst. (ACS)

Implementing A hierarchical classifier syst. • a motivationally autonomous adaptive animal

CFPS-C: A package of domain-independent subroutines for • classifier syst. in arbitrary, user-defined environments

Implicit niching in a learning classifier syst.: Nature’s way

Individual Discovering • decision rules: an appl. of GA

Induction CSs, Q-MORePhisms, and •

Inductive Inductive as an • bias for learning behavioral sequences

Operators and rule repair in a hybrid gen. learning syst.: some initial results

Inductive operators and rule repair in a hybrid gen. learning syst.: some results

Instinct as an inductive bias for learning behavioral sequences

Intelligence The classifier syst. A computational model that supports machine

Intelligent GA in continuous space and fuzzy classifier syst. for opening of door with manipulator of mobile robot: New benchmark of evol. training

Internal LS that learn • world models

Investigation An • into possible causes of, and solutions to, rule strength distortion in the bucket brigade

Investment Hybrid expert syst. for • advising

Invocation Extension of hierarchically CS using self GA

ion Learning classification rules from an • chromatography database using a GA-based classifier syst.

Iterated prisoners dilemma Multi-agent classifier syst. and the

Jaguar Kvarkki ja

Jaguar The Quark and the

KL-ONE A study of par. and progr. in classifier syst. and its appl. to classification in • semantic networks

Knowledge A proposal on payoffs and apportionment of credits of fuzzy classifier syst. - Finding of • for large scale syst.

Knowledge • A study on apportionment of credits of fuzzy classifier syst. for • acquisition of large scale syst.

Knowledge • A study on • finding using fuzzy classifier syst.

Knowledge base On-the-fly • refinement by a classifier syst.

Kvarkki ja jaguari

Latent Lookahead planning and • learning in a CSS

Learn CSS that • internal world models

Learning A classifier syst. for • spatial Rep. , based on a Pebble-Bond morphological wave propagation alg.

Delayed-action classifier syst. for • in temporal environments

Mathematical framework for studying • classifier syst.

A practical appl. of a • CS in a steel hot strip mill

A • classifier syst. for three-dimensional shape opt.

Adaptive image quantization based on • classifier syst.

An efficient classifier syst. and its experimental comparison with two representative • methods on three medical domains

Applying adaptive credit assignment alg. for the • classifier syst. based upon the GA

Autonomous vehicle navigation using evol. reinforcement •

Boolean function • with a classifier syst.

Classifier syst. • of Boolean concepts

Classifier syst. • of the Boolean multiplexer function

Classifier syst. • of a Boolean function

Computer-aided pipeline operation using GAs and rule

Credit assignment for pole balancing with • CSSs

Default hierarchy formation and memory exploitation in • classifier syst.

Efficient Par. • in CSSs

Empirical studies of default hierarchies and sequences of rules in • classifier syst.

Evol. organization of cooperative strategies in • classifier syst. organisms

Evol. of cntr. using temporal fuzzy classifier syst.

Fuzzy and probabilistic reasoning in simple • CSSs

Generating rules using a Holland based classifier syst.

Gen. • of dynamic sch. within a simulation environment

Implicit niching in a • classifier syst. : Nature’s way

Improved • in gen. rule-based classifier syst.

Inductive operators and rule repair in a hybrid gen. • syst.: some initial results

Instinct as an inductive bias for • behavioral sequences

Lookahead planning and • in a CSS

Modeling Simple Human Category • with a CSS
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**Notations**

†(ref) = the bibliography item does not belong to my collection of genetic papers.

* = only abstract seen.
? = data of this field is missing (BiBTeX-format).

The last field in each reference item in **Teletype** font is the BiBTeX key of the corresponding reference.
Appendix A

Abbreviations

The following other abbreviations were used to compress the titles of articles in the permutation title index:

- AI = Artificial Intelligence
- Alg. = Algorithm(s)
- AL = Artificial Life
- ANN(s) = Artificial Neural Net(work)(s)
- Appl. = Application(s), Applied
- Appr. = Approach(es)
- Cntr. = Control, Controlled, = Controlling, Controller(s)
- Coll. = Colloquium
- Comb. = Combinatorial
- Conf. = Conference
- CS(s) = Classifier System(s)
- Distr. = Distributed
- Eng. = Engineering
- EP = Evolutionary Programming
- ES = Evolutionstrategie(n), = Evolution(ary) strategies
- Evol. = Evolution, Evolutionary
- ExS(s) = Expert System(s)
- FF(s) = Fitness Function(s)
- GA(s) = Genetic Algorithm(s)
- Gen. = Genetic(s), Genetical(ly)
- GP = Genetic Programming
- Ident. = Identification
- Impl. = Implementation(s)

- Int. = International
- ImPr = Image Processing
- JSS = Job Shop Scheduling
- ML = Machine Learning
- Nat. = Natural
- NN(s) = Neural Net(work)(s)
- Opt. = Optimization, Optimal, = Optimizer(s), Optimierung
- OR = Operation(s) Research
- Par. = Parallel, Parallelism
- Perf. = Performance
- Pop. = Population(s), Populational(ly)
- Proc. = Proceedings
- Prog. = Programming, Program(s), Programmed
- Prob. = Problem(s)
- QAP = Quadratic Assignment Problem
- Rep. = Representation(s), Representational(ly)
- SA = Simulated Annealing
- Sch. = Scheduling, Schedule(s)
- Sel. = Selection, Selectionism
- Symp. = Symposium
- Syst. = System(s)
- Tech. = Technical, Technology
- TSP = Travel(ing) Salesman Problem
Appendix B

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 LATEX may have noticed that the references are printed using \texttt{abbrv} bibliography style and have no difficulties in interpreting the entries. For those not so familiar with LATEX 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), \textit{Title}, Publisher, Publisher's address, year.

**Example**


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

**Example**


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

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

**Example**


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

**Example**