# Advanced Methods of Online Searching for Artificial Intelligence Information

**Mott Given**

Defense Logistics Agency, DSAC-TMP, P.O. Box 160, Bldg. 27, Section 1, Columbus, OH 43216-5002
Electronic mail on INTERNET: mgiven@dsac.dla.mil UUCP: {...}.osu-cis!dsac!mgiven

ABSTRACT

A tremendous amount of information on artificial intelligence is available online via different computer networks. This paper will discuss resources available via USENET, INTERNET, BITNET, and other sources that allow information to be shared electronically on a worldwide basis. It will be shown how these networks are used in discussion groups, mailing lists, file transfers, mailservers, and databases.

## INTRODUCTION

A person working in artificial intelligence today has access to a vast amount information electronically, through the computer sitting on their desk. Computer networks allow people to become part of vast online communities where they can:

-send electronic mail across the world
-ask questions that will be distributed worldwide
-form special interest groups to follow the latest news in their area
-get copies of public domain software
-check library card catalogs to see what books are available for a particular subject

This paper will discuss how to do these things with your computer, but restrictions on the length of it prevent going into full detail about every facet of a topic. References or other sources of information are presented which the interested reader can consult for further detail. The viewpoints in this paper are mine and do not represent those of any official U.S. government agency.

## BITNET

This is a computer network that allows users to send mail and files to computers on BITNET. It differs from the INTERNET as BITNET does not allow users to remotely login to other computers (on BITNET), while the INTERNET does. BITNET also only connect mainframe type computers running certain operating systems, while the INTERNET connects a much wider range of computer types running a larger variety of operating systems.

BITNET has many interest groups which are distributed as mailing lists. You can subscribe to the mailing lists by sending electronic mail to the proper address. You can also subscribe to BITNET mailing lists even if your computer is not on BITNET, for many computer networks have gateways that allow them to communicate with BITNET. So, an INTERNET user could subscribe to a BITNET mailing list through such a gateway.

For example, suppose you see the mailing list mentioned "AG-EXP-L@NDSUVM1". The name of the mailing list is "AG-EXP-L" (it is for expert systems applications to agriculture). The name of the computer hosting the mailing list is "NDSUVM1." To sign up for this list, send a message to the name "LISTSERV" at the computer (eg. "NDSUVM1") that hosts it. LISTSERV is a computer service on BITNET that automatically answers electronic mail, by being able to automatically respond to certain commands. LISTSERV also archives and indexes past mail messages to the mailing list. If you are on BITNET, subscribe to AG-EXP-L by sending mail to "LISTSERV@NDSUVM1" with the following information. (If you are on the INTERNET instead, send mail to "LISTSERV%NDSUVM1.BITNET@CUNYVM.CUNY.EDU"):

SUBJECT: (leave this blank)
Message text:
SUBSCRIBE AG-EXP-L First.name Last.name
(Leave your electronic signature out of this message!)

BITNET mailing lists related to AI are shown in Appendix A. To subscribe to any of these lists, send mail to the address "listserv" instead of the name of the group, or else everybody on the mailing list will get a copy of your request to subscribe to the list. So, to subscribe to AILIST, your request would be mailed to "listserv%ndsumv1.bitnet@cunyvm.cuny.edu". Thus, the address "listserv" is used when a user is submitting administrative requests, such as being added or dropped from a mailing list; while the address "ailist%ndsumv1.bitnet@cunyvm.cuny.edu" is used to submit questions or comments to the list.

BITNET also has indexes its files so that old mail on its mailing lists is saved and can be searched by any word in the text. The searches are done by submitting specially formatted electronic mail to the user "LISTSERV" on a computer that carries the mailing list. For example, to search for articles on the expert system shell "Clips" from the mailing list "AILIST", one would send the following letter to addressee "listserv%ndsuvm1.bitnet@cunyvm.cuny.edu" , leaving the subject field of the message blank. (The welcome message one gets after subscribing to a mailing list usally tells one how to electronically get the file that tells how to do this type of search.)

```
// JOB Echo=No
Database Search DD=Rules
//Rules DD *
Search clips in AILIST
Print ALL
/*
```

For additional information on how to use LISTSERV commands to search for information in past postings to BITNET mailing lists, please see Charles W. Bailey's

article "The Public-Access Computer Systems Forum: A Computer Conference on BITNET" in Vol. 9, No. 2, March - April 1990, pages 71-74 of "Library Software Review."

INTERNET

The INTERNET is a network of computer networks, i.e. it links around 5000 networks in 35 countries serving 3 million people. The INTERNET connects more than 313,000 computers throughout the world. It permits users to send electronic mail, transfer files, and remotely login to hosts anywhere on the INTERNET (for which they have a user account). One of the most useful features is the "whois" command, which can be used to identify a user's electronic mail address and phone number by using the command "whois username ". The "whois" command will only identify a user if he or she has registered their name, which can only be done via electronic mail sent to "registrar@nic.ddn.mil."

To get more information about the INTERNET, you can contact:

DDN Network Information Center
SRI International
Network Information Systems Center, Room EJ291
333 Ravenswood Ave.
Menlo Park, CA 94025
Email: NIC@NIC.DDN.MIL
Phone: 800-235-3155 or 415-859-3695

If you are not on the INTERNET, contact the above agency to learn how to get connected to it. As the INTERNET is a network of networks, you must be connected to some other network (that is on INTERNET) before you can get connected to it. If you are not on any network, among some of the networks people subscribe to (to get onto INTERNET) are:

| | |
|---|---|
| BITNET | Phone: 202-872-4200 |
| CSNET | Phone: 617-873-2777 |
| NSFNET | Phone: 617-873-3400 |
| UUNET | Phone: 703-876-5050 |

For additional information about many computer networks including the INTERNET, consult the book "The Matrix: Computer Networks and Conferencing Systems Worldwide", by John Quarterman, published by Digital Press in 1990. Other excellent sources are the following articles:

"A New Information Infrastructure" by Caroline R. Arms, pages 15-22 of the Sept. 1990 issue of ONLINE.
"Using the National Networks: BITNET and the INTERNET," by Caroline R. Arms, pages 24-29 of the Sept. 1990 issue of ONLINE.

The INTERNET has a number of mailing lists related to AI, shown in Appendix B.

The INTERNET network allows users to electronically transfer files over the network from a remote computer directly into their home computer. Many computers have public directories that outsiders can login to under "anonymous" guest accounts to obtain files and transfer them in this way, in a process known as "anonymous FTP" (File Transfer Protocol). A table of AI software available by anonymous FTP is given in Appendix E. It is beyond the scope of this article to give a detailed description of how to do anonymous FTP, but the interested reader can called the DDN Network Information Center at the previously mentioned phone number, or consult Caroline R. Arms article "Using the National Networks: BITNET and the INTERNET" in the September 1990 issue of ONLINE magazine.

USENET

This is a news and mailing list network running under the UNIX operating system that has hundreds of special interest groups, including many related to artificial intelligence. USENET has over 10,000 hosts and greater than 250,000 users, and is run with no central administration in a very distributed way. Each newsgroup allows questions to be posted which can be seen and answered by anyone else in the world with access to USENET. The newsgroups are passed via electronic mail from computer to computer by sites that agree to participate in USENET. USENET is not a computer network in the sense that the INTERNET is. The USENET newsgroups are analogous to, although not exactly the same as, the conference or message sections of electronic bulletin boards.

You can post to any United States-originated USENET newsgroup from the INTERNET by sending a message to newsgroup-name@ucbvax.berkeley.edu (provided the newsgroup is not an internal one set up for a particular institution).

As an example of the great power of USENET, a question posted to comp.ai on justification based truth maintenance systems is shown below, with a reply shown following (to save space I have removed many of the headers you would have seen in each of the items below).

From: sreedhar@cleanhead.cs.unlv.edu
Newsgroups: comp.ai
Subject: JTMS

Hello everybody:

I am presently working on Justification Based Truth Maintenace system. I have been reading Doyle paper in AI journal. I am interested in actually see it work. I am sure there are systems implemented. Can any one give me some pointers to source code to JTMS. I prefer C code under unix or interface to systems like clips.
thanks
sridhar

Here is an answer to the question posted to the newsgroup comp.ai:

From: duchier@cs.yale.edu (Denys Duchier)
Newsgroups: comp.ai
Subject: Re: JTMS
Newsgroups: comp.ai

In-reply-to: sreedhar@cleanhead.cs.unlv.edu's message of 22 Nov 90 22:29:14 GMT

In article <1990Nov22.222914.11422@unlv.edu> sreedhar@cleanhead.cs.unlv.edu writes:
> I am presently working on Justification Based Truth
> Maintenance system. I have been reading Doyle paper
> in AI journal. I am interested [...]

From the department of computer science at Yale University:
A General Framework for Reason Maintenance
Drew McDermott
YALEU/CSD/RR #691
March 1989

This report presents a unified treatment of justification-based (Doyle), logic-based (McAllester), assumption-based (McDermott, DeKleer), and other sorts of RMSes. It also includes a lisp implementation in appendix.
--Denys

USENET newsgroups related to AI are shown in Appendix C.

Bibliographies and reports

On the INTERNET, one can do anonymous FTP to several sites for AI bibliographies and technical reports, as shown in Appendix D.

RAID database

The RAID database is a source of information about artificial intelligence and robotics projects. It has data on principal investigators of projects, a calendar of upcoming AI conferences, and occasional reports on AI conferences that users have attended. RAID is only available to government employees or contractors, at no cost. For further information contact Mike Dwyer at 619-553-5308 or Kathi Meyer at 619-225-2548.

CRISP database

The CRISP (Computer Retrieval of Information on Scientific Projects) database has data on research programs supported by the U.S. Public Health Service. It would be a good source of information for someone interested in AI in medicine. For searches or information, contact: Research Documentation Section, Information Systems Branch, Division of Research Grants, National Institutes of Health, Westwood Bldg, Room 148, Bethesda, MD 20892 or telephone 301-496-7543.

Electronic BBS

"AI Expert" magazine has a list of electronic bulletin board numbers in each issue called "AI Expert ONLINE," which can be used to download the source code associated with each issue of the magazine. The code is associated with different articles and may be in LISP, PROLOG, C, BASIC, or another language. Each of the bulletin boards may also have other AI files, with the most noteworthy one being called Central Neural System in Texas at 817-551-9363 (with modem setup 2400 baud, 8-N-1) as it probably has more neural network information than any BBS in the country.

If you are looking for public domain or shareware AI software, try the BBS operated by Bill Keller at 412-244-9416, accessible at 2400 baud, N-8-1 modem setup. Presently, it is only accessible from 9PM to 9AM. A description of this BBS appears on page 10 of the November/December issue of PC AI magazine.

There is an electronic bulletin board for software from COSMIC, including CLIPS and NETS. COSMIC is a nonprofit agency that distributes software developed by NASA and other government agencies. The phone numbers for the BBS are 713-280-3896 or 713-280-3892 (modem setup 2400 baud, N-8-1)

Library catalogs accessible on INTERNET

Many library catalogs are accessible from the INTERNET. This is very significant as it allows you to do subject searches for publications over the INTERNET. For example, you might be interested in books on how to do LISP programming. A subject search on this would allow you to get the complete bibliographical information on the LISP books to get it them on interlibrary loan or purchase them. To get a list of the libraries accessible on INTERNET, one can do anonymous FTP to the computer host ariel.unm.edu, change directory to the "library" one, and get either the file "internet.library" (ASCII format) or "internet.library.ps" (in Postscript format).

LIDO mailserver

The University of Saarbruecken Computer Science Department has developed a large database of over 13,000 articles on artificial intelligence. It is set up to operate as a mail server called the "LIDO mailserver," which answers users questions automatically to electronic mail following a particular format. Messages to the LIDO MAILSERVER should be sent to: lido@cs.uni-sb.de. A message can be sent to this address to get instructions on using it. The LIDO mailserver may take 2 or 3 day to reply to you because of delays in getting e-mail to Germany and back.

Project Mercury

Project Mercury is a service for AAAI members that allow one to retrieve references on AI from a database kept at Carnegie Mellon University. The database can be accessed online through "telnet" on the INTERNET, or by specially formatted electronic mail which usually gets a response by the next day. The database search requests may return a list of references, a collection of abstracts, or a full-text article. For more info call Kimberly Ginther-Webster at CMU, 412-268-6107, or send e-mail on the INTERNET to KG18@andrew.cmu.edu.

SUMMARY

This article has covered the subject by presenting different information sources, and delineating what they cover. This summary will take the opposite approach of discussing various information queries, and suggesting which of the discussed sources to consult for the answer. If an artificial intelligence worker's telephone number and electronic mail address are desired, and you are using a computer on the INTERNET network, then you can use the "whois" command which is documented in the INTERNET section of this paper. If you cannot find the user this way, consult the RAID database.

If you are interested in information on an expert system shell, have a librarian run an online search of Computer Database. If you lack the funds or wherewithal for that, consult your local libraries to see if they have free public access to an online database like InfoTrak or Wilsonline.

If you have a specific technical question, posting to the appropriate USENET newsgroups would be the best approach to pursue. If your site does not get USENET, then sending mail to the appropriate list on INTERNET or BITNET would be a fruitful approach.

If your interest is in getting free or very low cost AI software, then the best course would be to use some of the computer bulletin boards mentioned in the Electronic BBS section of this paper, or to get the software by anonymous FTP as listed in the table in Appendix A.

## APPENDIX A BITNET mailing lists

The column on the left shows the name of the list, while the column on the right shows the computer address for submitting questions to the list.

| | |
|---|---|
| AILIST (same as comp.ai USENET newsgroup) | ailist%ndsuvm1.bitnet@cunyvm.cuny.edu |
| Computational linguistics | ln%frmop11.bitnet@cunyvm.cuny.edu |
| Color and Vision research | cvnet%yorkvm1.bitnet@cunyvm.cuny.edu |
| Cybernetics and Systems | cybsys-l@bingvm.bitnet@cunyvm.cuny.edu |
| Expert Systems Environment shell | ese-l%sbccvm.bitnet@cunyvm.cuny.edu |
| Expert Systems in Agriculture | ag-exp-l%ndsuvm1.bitnet@cunyvm.cuny.edu |
| Florida Artificial Intelligence Research Symposium | flair@ucf1vm.bitnet |
| German AI | mod-ki%unido.irb@unido.bitnet |
| Linguistics | linguist-request@uniwa.uwa.oz.au |
| Speech production and perception | r34334%uqam.bitnet@cunyvm.cuny.edu |
| Stony Brook Prolog | sbprlg-l%sbccvm.bitnet@cunyvm.cuny.ed |
| Translation and interpretation of natural language | lantra-l%finhutc.bitnet@cunyvm.cuny.edu |

## APPENDIX B INTERNET mailing lists for AI

| | |
|---|---|
| AI applications to Human-Computer interface design | wiley!ai-chi@lll-lcc.llnl.gov |
| AI in education | ai-ed@sumex-aim.stanford.edu |
| AI in medicine | aim-request@vuse.vanderbilt.edu |
| AI in United Kingdom | ikbsbb-request@informatics.rutherford.ac.uk |
| AI Vision research | vision-list@ads.com |
| Artificial Life | alife-mailing-list@iuvax.cs.indiana.edu |
| Cellular Automata | ca-think@com |
| Connectionism | connectionists@cs.cmu.edu |
| Concurrent logic programming | clp.x@xerox.com |
| COSMIC (technology transfer organization) | service@cossack.cosmic.uga.edu |
| Distributed artificial intelligence | dai-list@mcc.com |
| Genetic algorithms | ga-list-request@aic.nrl.navy.mil |
| Japanese AI | fj-ai%etl.jp@relay.cs.net |
| Lambda Prolog | elp@cs.cmu.edu |
| Natural language | nl-kr@cs.rochester.edu |
| Navy Center for Applied Research in AI | symposia@aic.nrl.navy.mil |
| Neural nets | neuron%csl.ti.com@relay.cs.net |
| Neural network benchmark mailing list | nn-bench-request@cs.cmu.edu |
| Nexpert users | nexpert-users-request@cam.edrc.cmu.edu |
| Rochester Connectionist Simulator users | simulator-users@cs.rochester.edu |

## APPENDIX C USENET AI newsgroups

| | |
|---|---|
| alt.hypertext | Hypertext |
| aus.ai | Australian AI |
| comp.ai | AI in general |
| comp.ai.edu | AI for education |
| comp.ai.neural-nets | Neural nets |
| comp.ai.nlang-know-rep | Natural language representation |
| comp.ai.philosophy | AI and philosophy |
| comp.ai.shells | Shell software for AI |
| comp.cog-eng | Cognitive engineering |
| comp.lang.clos | CLOS |
| comp.lang.eiffel | Eiffel language |
| comp.lang.lisp | LISP |
| comp.lang.lisp.franz | Franz Lisp |
| comp.lang.lisp.x | X-Lisp |
| comp.lang.prolog | Prolog |
| comp.lang.scheme | Scheme (a dialect of LISP) |
| comp.lang.scheme.c | Scheme implemented in C language |
| comp.lang.smalltalk | Smalltalk |
| dla.ai | Defense Logistics Agency internal AI group |
| fj.ai | Japanese AI |
| gnu.emacs.lisp.manual | LISP-related |
| gnu.smalltalk.bug | Smalltalk dialect from GNU |
| osu.ai | Ohio State University (OSU) internal AI group |
| sci.logic | logic |
| uk.ikbs | United Kingdom AI |

APPENDIX D Electronic bibliographies

| SUBJECT MATTER | FTP SITE FOR SOFTWARE | DIRECTORY STORING IT | ADDITIONAL COMMENTS |
|---|---|---|---|
| AI general topics | ai.istc.ca | /pub/bib | Bibliography |
| AI general topics | nervous.cis.ohio-state.edu | /pub | |
| AI general topics | sumex-aim.stanford.edu | /pub/ai*.bib | Bibliography |
| AI in Japan | cs.arizona.edu | /japan/kahaner.reports | Tech reports |
| Artificial life | iuvax.cs.indiana.edu | /pub/alife/papers | Bibliography |
| Cognitive science | princeton.edu | /pub/harnad | Tech reports |
| Cognitive science | cogsci.indiana.edu | /pub/chalmers.bib.* | Bibliographies |
| Machine learning | ics.uci.edu Use login "anonymous" | /ml-list and password "anonymous" | Tech reports |
| Natural language | archive.cs.rpi.edu | /nl-kr | comp.ai.nlang-know-rep USENET group old issues |
| Neural networks | cheops.cis.ohio-state.edu | /neuroprose | Tech reports |
| Neural networks | hplpm.hlp.hp.com | /pub/Neuron-Digest | Neuron Digest old issues |

APPENDIX E FTP software

| SOFTWARE NAME | FTP SITE FOR SOFTWARE | DIRECTORY IT IS STORED IN | TYPE OF SOFTWARE |
|---|---|---|---|
| AKCL | rascal.ics.utexas.edu | /pub | Austin Kyoto Common Lisp |
| bps | gmuvax2.gmu.edu | /nn | back-prop neural net |
| Cascade Correlation algorithm | pt.cs.cmu.edu | /afs/cs/project/connect/code | neural net |
| Cellsim | turing.cs.rpi.edu | /pub/cellsim | cellular automata |
| CONDELA | tut.cis.ohio-state.edu | /pub/condela | neural net |
| elk | labrea.stanford.edu<br>uunet.uu.net<br>mcsun.eu.net<br>funic.funet.fi | /pub<br>/X11<br>/programming/languages/elk-scheme<br>/pub/unix/languages/scheme | Scheme |
| Fools Lisp | scam.berkeley.edu | /src/local/fools.tar.Z | LISP |
| FROBS | cs.utah.edu | /pub/frobs.tar.Z | frames & objects (Lisp) |
| FROLIC | cs.utah.edu | /pub/frolic.tar.Z | Prolog in Common Lisp |
| FULL | doghen.boltz.cs.cmu.edu | /full/full.tar.Z | neural net |
| GENESIS | sdcsvax.ucsd.edu | /pub/GA | neural net |
| GNU Smalltalk | prep.ai.mit.edu | /pub/gnu/smalltalk.1.1.tar.Z | Smalltalk |
| GRADSIM | linc.cis.upenn.edu | /pub/gradsim.v2.tar.Z | neural net |
| GROPE | louie.udel.edu | /pub/Grope.tar.Z | Smalltalk application |
| HST | hplpm.hlp.hp.com | /pub/Neuron-Software | Hopfield net |
| ilisp | a.gp.cs.cmu.edu | /afs/cs/user/ccm/afs/src/gnu/ilisp | Emacs to Lisp interface |

| SOFTWARE NAME | FTP SITE FOR SOFTWARE | DIRECTORY IT IS STORED IN | TYPE OF SOFTWARE |
|---|---|---|---|
| Integrated Generic Task Toolset | tut.cis.ohio-state.edu | /pub/toolset/toolset.tar.Z | CSRL LISP package |
| lambda PROLOG | a.ergo.cs.cmu.edu | /pub/ess | Prolog |
| Little Smalltalk | cs.orst.edu | /pub/budd/small.v3.tar | Smalltalk |
| machine learning databases | ics.uci.edu | /usr2/ftp/spool/pub/machine-learning-databases | Databases for testing |
| Mactivation | boulder.colorado.edu | /pub | neural net for Macintosh |
| mit cscheme-7.0 | ftp.diku.dk | /pub/scheme-7.0. | Scheme |
| Mul-T | masala.lcs.mit.edu | /pub | Scheme |
| opt | cse.ogc.edu | /ogc2/guest/ftp/pub/nnvowels | neural net |
| PCL | arisia.xerox.com | /pcl | LISP |
| PDP | hplpm.hlp.hp.com | /pub/Neuron-Software | Examples from book "PDP" |
| pdprolog | wuarchive.wustl.edu | /mirrors/msdos/prolog | Prolog |
| PFL | linc.cis.upenn.edu | /pub/pfl | Lisp |
| Picasso | 128.32.149.1 | /pub | CLOS-based GUI |
| Pseudoscheme | zurich.ai.mit.edu | /pub/pseudo/pseudo-2-7.tar | Scheme |
| Rochester Connectionist Simulator | cs.rochester.edu | /pub/simulator | neural net |
| ROLOG | cs.uiuc.edu | /pub/ROLOG | parallel PROLOG |
| SBprolog | cs.arizona.edu | /sbprolog | Prolog |
| SB-HiLog | sbcs.sunysb.edu | /pub/hilog/hilog.tar.Z | Prolog |
| Scheme->C | gatekeeper.dec.com | /pub/DEC/Scheme-to-C | Scheme |
| SchemeTex | 192.12.120.51 | /pub/schemeTeX.sh | Scheme |
| schelog | titan.rice.edu | /public/schelog.sh | Scheme |
| SCIX | expo.lcs.mit.edu | /contrib/scix-0.96.tar.Z | Scheme & X windows |
| SIOD | BU.EDU | /users/gjc | Scheme in One Defun |
| SunNet | boulder.colorado.edu | SunNet5.5.tar.Z | neural net |
| T | WHEATIES.AI.MIT.EDU | /pub/t3.1. | Scheme |
| Tmycin | sumex-aim.stanford.edu | /tmycin | Tiny Mycin (LISP) |
| VHDL parser | mcns.mcnc.org | vhdl.tar.Z | Prolog |
| XScheme | terminator.cc.umich.edu orville.nas.nasa.gov | /msdos xscheme-0.22.tar | Scheme |
| XWIP | expo.lcs.mit.edu | /contrib/R4/xwip.tar.Z | Prolog X window interface |
| WINTERP | expo.lcs.mit.edu | /contrib/winterp | Xlisp and OSF MOTIF |
| YYonX | ftp.csrl.aoyama.ac.jp | YY directory | Common Lisp & X windows |

## APPENDIX F INDEXES

ACM Guide to Computing Literature
Applied Science and Technology Index
Artificial Intelligence Abstracts
Compact Disclosure
Compuscience
Computer abstracts
Computer and Control Abstracts (Science Abstracts, Series C)
Computer and Information Systems Abstracts Journal
Computer and Mathematics Search
Computer database - is especially good for looking up software evaluations or articles from popular AI magazines instead of research ones
Computer literature index
Computing and information resources directory
Computing information directory
Computing reviews
COMPENDEX
InfoTrak
INSPEC (an online version of Science Abstracts)
Microcomputer index
NTIS (National Technical Information Center)
Scientific DataLink index to artificial intelligence research
Supertech
Turing Institute Bibliographic database.
US GPO Monthly Catalog
Wilsonline

Robert Carande has an excellent article on many of the online databases in AI Expert magazine, June 1988, pages 60-65 in the article "Checking out AI Sources." In addition, Carande's article also covers other AI information sources besides online databases, including indexes and abstracts, literature guides, proceedings, magazines and newsletters, and publishers. This article does not cover those other types of information as its thrust is concerned with online information sources.

David Stern does an excellent job of comparing many of the online databases for AI information in his article "Artificial Intelligence Databases: A Survey and Comparison" in pages 19-24 of the August 1990 issue of Database magazine. He recommends INSPEC as the primary source to be consulted, and delineates the particular coverage strength of other databases.

Some of the databases such as InfoTrak, Compact Disclosure, Wilsonline, and Compendex are available for free use at public or academic libraries.

## REFERENCES

Applied Artificial Intelligence in Japan: Current Status, Key Research and Development Performers, Strategic Focus, by Bruce Rubinger, Hemisphere Publishing Corp., New York, 1988.

"Internet privatization adrift," Computerworld, Vol. 44 No. 48, Nov. 16, 1990, page 1.

INTERNET Resource Guide, NSF Network Service Center (of BBN Systems and Technologies Corp.), Cambridge, MA, 1989.