Knowledge Based Information Retrieval: A Semiotic Approach

Volume 2: Appendices

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APPENDICES

Appendix A

Evaluation of Offline prints: User Instructions

User's Term Selection Characteristics - Term Selection

Step 1 Please go through the list of terms and select all the terms that you consider good for the purpose of your search

Step 2 Please rank the terms you have chosen in step 1 in descending order of importance for your search

Step 3 Please indicate the terms representing new ideas to you (i.e. was not part of your original query) among the terms chosen in Step 1.

User's Term Selection Characteristics - Linked Terms (Batches)

In respect of each Batch, can you assess the batch as a whole in one of the following ways? :

A : The batch as a whole looks good for my search purpose

B : None of the terms in the batch are good for my search purpose

If not, can you describe it by one of the following categories ? :
(please, indicate all that apply)

C : Some of the terms in the batch are good for my search purpose

D : The batch contains some good terms, however there is/are term(s) in the batch that I would definetely want to exclude from my search statement

E : The batch contains terms that are marginally related to my search (or of secondary importance)

F : The batch contains terms that represent new ideas which are useful to my search

G : The batch contains term(s) that represent ideas which is/are part of the general domain of my search, however not directly useful to me

H : None of the above (please explain)

Instructions for Relevance Judgements

Your query expression was :

We would like you to go through the given list of references and make relevance judgement on each of the reference in the list.

You should judge the references according to being relevant or not to to the subject domain as described by your query statement, regardless of whether you have seen the reference or the document it refers to before.

Please make judgement for each reference by using one of the three categories given below :

RELEVANT	: R	or	tick
NOT -RELEVANT	: N	or	cross
Partially RELEVANT	: P	or	?

Appendix B

Exact Matching Terms: Experiment 1

The alphanumeric characters in brackets after exact matching terms indicate the number of the heuristic, in section 7.3.1.4, applied

User 1-Search terms: expert systems education

1 alarm systems
2 computer science education
3 cordless telephone systems
4 diagnostic expert systems
5 education
6 expert systems
7 hydraulic systems
8 medical expert systems
9 queueing theory
10 safety systems
11 schlieren systems
12 science education
13 security
14 security systems
15 server systems
16 servo systems
17 servomechanisms
18 spin systems
19 stochastic systems
20 switching systems
21 systems analysis
22 systems design
23 systems engineering
24 systems programming
25 systems software
26 telecommunication systems
27 telegraph systems
28 telemetering systems
29 telephone systems
30 telepoint systems
31 television systems
32 tracking systems
33 transportation
34 transportation systems
35 transputer systems
36 warning systems

Exact Matching Terms: expert systems, education (I.iii-a)

User 2-Search terms: tracking noise edge

1 1/f noise
2 Gaussian noise
3 Johnson noise
4 Nyquist noise
5 Schottky noise
6 acoustic noise
7 atmospheric noise
8 atmospherics
9 burst noise
10 edge detection
11 edge dislocations
12 edge extraction
13 electrical noise
14 flicker noise
15 interference suppression
16 noise
17 noise abatement
18 noise elimination
19 noise generators
20 noise measurement
21 popcorn noise
22 random noise
23 resistance noise
24 sales management
25 sales tracking
26 shot noise
27 solar noise
28 solar radiofrequency radiation
29 sonar
30 surface discharges
31 thermal noise
32 tracking
33 tracking insulation
34 tracking sonar
35 tracking systems
36 white noise

Exact Matching Terms: None

User 3-Search terms: hypertext technical manual database

1 database languages
2 database machines
3 database management systems
4 database querying
5 database theory
6 databases
7 databases, online
8 deductive databases
9 distributed databases
10 factographic databases
11 federated databases
12 hierarchical databases
13 hypermedia
14 hypertext
15 image databases
16 information retrieval
17 information retrieval systems
18 information services
19 intelligent databases
20 local area networks
21 manuals, user
22 network databases
23 office automation
24 online databases
25 pictorial databases
26 presentation, technical
27 protocols
28 query languages
29 relational databases
30 replicated databases
31 spatial databases
32 special purpose computers
33 technical information centres
34 technical office protocol
35 technical presentation
36 technical support services
37 temporal databases
38 user manuals
39 visual databases

Exact Matching Terms: None

User 4-Search terms: conceptual graphical query language

1 SQL
2 Structured Query Language
3 assembly language
4 assembly language listings
5 business graphics
6 computer graphic equipment
7 computer graphics
8 concepts index language
9 data querying
10 database querying
11 engineering graphics
12 formal languages
13 grammars
14 graphic equipment, computer
15 graphical languages
16 graphical user interfaces
17 graphics scanners
18 graphics, computer
19 image scanners
20 information retrieval
21 job control language listings
22 language translation
23 language, linguistics
24 languages
25 linguistics
26 linguistics, language
27 machine language generation
28 natural language interfaces
29 natural language processing
30 natural languages
31 presentation graphics
32 program compilers
33 query languages
34 query optimisation
35 query processing
36 rendering computer graphics
37 translation language
38 visual languages
39 vocabulary

Exact Matching Terms: None

User 5-Search terms: texture detection fractals

1 acoustic variables measurement
2 air tightness detection
3 crack detection
4 crystallite texture
5 demodulation
6 detection demodulation
7 differential detection
8 edge detection
9 electron detection and measurement
10 error detection
11 error detection codes
12 feature detection
13 feature extraction
14 flaw detection
15 fractals
16 heterodyne detection
17 hyperon detection and measurement
18 image texture
19 isotope detection
20 leak detection
21 meson detection and measurement
22 muon detection and measurement
23 neutrino detection and measurement
24 neutron detection and measurement
25 pitch detection
26 pollution detection and control
27 proton detection and measurement
28 recrystallisation texture
29 recrystallization texture
30 signal detection
31 surface texture
32 texture
33 texture, surface

Exact Matching Terms: None

User 6-Search terms: online information evaluation quality reliability

1 Q-factor
2 circuit reliability
3 computer equipment evaluation
4 computer evaluation
5 computer performance evaluation
6 databases, online
7 equipment evaluation
8 equipment evaluation computers
9 front-ends for online searching
10 function evaluation
11 information retrieval
12 information retrieval system evaluation
13 information retrieval systems
14 information services
15 interactive programming
16 management
17 nuclear reactor quality assurance
18 online databases
19 online front-ends
20 online literature searching
21 online operation
22 online programming
23 online services
24 performance evaluation
25 power supply quality
26 power system reliability
27 quality control
28 quality factor
29 radio reception
30 radio reception quality
31 reception
32 reception quality
33 reliability
34 reliability theory
35 software quality
36 software reliability
37 television reception
38 television reception quality
39 total quality management

Exact Matching Terms: None

User 7- Search terms: polarisation mqw splitter

1 MQW lasers
2 X-ray binary stars
3 X-ray polarisation
4 beam splitters optical
5 beta-ray polarisation
6 cataclysmic binary stars
7 circular polarisation
8 deuteron polarisation
9 dielectric polarisation
10 dynamic nuclear polarisation
11 electromagnetic wave polarisation
12 electron spin polarisation
13 elliptical polarisation
14 gamma-ray polarisation
15 intermediate polars
16 light polarisation
17 neutron polarisation
18 nuclear polarisation
19 nuclear polarisation in liquids and solids
20 optical elements
21 optical polarisation
22 optical polarisers
23 optical polarizers
24 photon polarisation
25 plane polarisation
26 polarisation
27 polarisation in elementary particle interactions
28 polarisation in elementary particle scattering
29 polarisation in nuclear reactions and scattering
30 polars
31 proton polarisation
32 quantum electrodynamics
33 semiconductor lasers
34 thermally stimulated currents
35 thermally stimulated polarisation
36 vacuum polarisation
37 white dwarfs

Exact Matching Terms: semiconductor lasers (preferred term for "MQW lasers"),
polarisation,
optical elements (preferred term for "beam splitters optical")
(I.iii-b)

User 8-Search terms: cd-rom networking

1 CD-ROM publication
2 CD-ROM searching
3 CD-ROMs
4 ISDN
5 Information Network System
6 Systems Network Architecture
7 active networks
8 broadband networks
9 butterfly networks
10 cascade networks
11 circuit theory
12 communication networks
13 computer networks
14 coupled circuits
15 coupled networks
16 database management systems
17 electric networks
18 equalisers
19 hypercube networks
20 information retrieval
21 multiport networks
22 network analysers
23 network analysis
24 network analyzers
25 network databases
26 network equalisers
27 network equalizers
28 network interfaces
29 network parameters
30 network routing
31 network servers
32 network synthesis
33 network theory
34 network topology
35 networks
36 networks circuits
37 open systems
38 optical publishing
39 telecommunication networks
40 wideband networks

Exact Matching Terms: None

Appendix C

Term Ranks and Selection of the Source Terms: Experiment 1

The alphanumeric characters in brackets after selected source terms indicate the number of the heuristic, in section 7.3.1.4, applied

User 1-Search terms: expert systems education

1	expert systems	W= 1889588
2	computer science education	W= 511500
3	education	W= 188901
4	medical expert systems	W= 20449
5	diagnostic expert systems	W= 19965
6	systems analysis	W= 1626
7	alarm systems	W= 756
8	systems engineering	W= 528
9	hydraulic systems	W= 336
10	telecommunication systems	W= 120
11	security	W= 20
12	telegraph systems	W= 10
13	safety systems	W= 0
14	schlieren systems	W= 0
15	television systems	W= 0
16	cordless telephone systems	W= -0
17	spin systems	W= -0
18	switching systems	W= -12
19	systems software	W= -22
20	telemetering systems	W= -54
21	transputer systems	W= -77
22	telephone systems	W= -78
23	tracking systems	W= -105
24	servomechanisms	W= -123
25	stochastic systems	W= -224
26	transportation	W= -306
27	queueing theory	W= -729

Selected Source Terms: expert systems and education (II.ii)

User 2-Search terms: tracking noise edge

1	tracking	W= 5734
2	edge detection	W= 3564
3	noise	W= 2162
4	interference suppression	W= 1950
5	tracking systems	W= 1768
6	random noise	W= 1457
7	white noise	W= 1078
8	sonar	W= 186
9	nois abatement	W= 148
10	acoustic noise	W= 60
11	thermal noise	W= 60
12	atmosferics	W= 0
13	edge dislocations	W= 0
14	noise generators	W= 0
15	noise measurement	W= 0
16	sales management	W= 0
17	solar radiofrequency radiation	W= 0
18	surface discharges	W= 0

Selected Source Terms: tracking and edge detection (II.vi)

User 3-Search terms: hypertext technical manual database

1	hypermedia	W= 27783
2	user manuals	W= 5226
3	information retrieval systems	W= 3649
4	information retrieval	W= 3402
5	database management systems	W= 1972
6	technical presentation	W= 1890
7	technical support services	W= 1342
8	relational databases	W= 690
9	information services	W= 621
10	query languages	W= 493
11	database theory	W= 273
12	deductive databases	W= 216
13	distributed databases	W= 98
14	factografic databases	W= 78
15	office automation	W= 70
16	visual databases	W= 44
17	special purpose computers	W= 9
18	temporal databases	W= 0
19	protocols	W= 0
20	local area networks	W= 0

Selected Source Terms: hypermedia and user manuals (II.vi)

User 4-Search terms: conceptual graphical query language

1	query languages	W= 11328
2	graphical user interfaces	W= 8372
3	computer graphics	W= 6480
4	information retrieval	W= 2592
5	query processing	W= 1643
6	engineering graphics	W= 1554
7	natural languages	W= 950
8	visual languages	W= 868
9	sql	W= 144
10	natural language interfaces	W= 140
11	linguistics	W= 78
12	rendering computer graphics	W= 58
13	formal languages	W= 56
14	computer graphic equipment	W= 44
15	business graphics	W= 34
16	grammars	W= 25
17	vocabulary	W= 14
18	image scanners	W= 6
19	assembly language	W= 0
20	assembly language listings	W= 0
21	job control language listings	W= 0
22	languages	W= 0
23	language translation	W= 0
24	program compilers	W= 0

Select Source Terms: query languages and graphical user interfaces (II.vi)

User 5-Search terms: texture detection fractals

1 fractals	W= 94050
2 image texture	W= 2520
3 edge detection	W= 768
4 surface texture	W= 414
5 flaw detection	W= 364
6 feature extraction	W= 363
7 texture	W= 335
8 demodulation	W= 32
9 acoustic variables measurement	W= 0
10 crack detection	W= 0
11 electron detection and measurement	W= 0
12 error detection codes	W= 0
13 hyperon detection and measurement	W= 0
14 isotope detection	W= 0
15 leak detection	W= 0
16 meson detection and measurement	W= 0
17 muon detection and measurement	W= 0
18 neutrino detection and measurement	W= 0
19 neutron detection and measurement	W= 0
20 pollution detection and control	W= 0
21 proton detection and measurement	W= 0
22 recrystallisation texture	W= 0
23 error detection	W= -0
24 signal detection	W= -6

Selected Source Terms: fractals and image texture (II.vi)

User 6-Search terms: online information evaluation quality reliability

1	information retrieval system evaluation	W= 4165
2	software reliability	W= 3781
3	quality control	W= 3760
4	information services	W= 1141
5	reliability	W= 456
6	software quality	W= 320
7	online front-ends	W= 60
8	power supply quality	W= 16
9	online operation	W= 14
10	nuclear reactor quality assurance	W= 0
11	Q-factor	W= 0
12	radio reception	W= 0
13	reception	W= 0
14	television reception	W= 0
15	equipment evaluation	W= -0
16	function evaluation	W= -0
17	power system reliability	W= -0
18	interactive programming	W= -22
19	circuit reliability	W= -36
20	computer evaluation	W= -70
21	information retrieval	W= -158
22	reliability theory	W= -209
23	management	W= -250
24	information retrieval systems	W= -360
25	performance evaluation	W= -880

Selected Source Terms: information retrieval system evaluation and software reliability (II.vi)

User 7- Search terms: polarisation mqw splitter

1	light polarisation	W= 12096
2	electro magnetic wave polarisation	W= 6004
3	dielectric polarisation	W= 1692
4	polarisation	W= 1692
5	optical polarisers	W= 945
6	polarisation in elementary particle interactions	W= 504
7	optical elements	W= 256
8	quantum electro dynamics	W= 213
9	electron spin polarisation	W= 110
10	nuclear polarisation	W= 110
11	polarisation in nuclear reactions ands cattering	W= 110
12	polarisation in elementary particle scattering	W= 110
3	proton polarisation	W= 110
14	X-ray binary stars	W= 0
15	beta-ray polarisation	W= 0
16	cataclysmic binary stars	W= 0
17	deuteron polarisation	W= 0
18	dynamic nuclear polarisation	W= 0
19	gamma-ray polarisation	W= 0
20	neutron polarisation	W= 0
21	nuclear polarisation in liquids and solids	W= 0
22	photon polarisation	W= 0
23	semiconductor lasers	W= 0
24	thermally stimulated currents	W= 0
25	white dwarfs	W= 0

Selected Source Terms: polarisation and optical elements (II.v)

User 8-Search terms: cd-rom networking

1	computer networks	W= 790158
2	CD-ROMs	W= 184230
3	hypercube networks	W= 119724
4	broadband networks	W= 111350
5	telecommunication networks	W= 111219
6	network topology	W= 60270
7	ISDN	W= 59426
8	open systems	W= 34506
9	network servers	W= 30590
10	network synthesis	W= 18684
11	network interfaces	W= 15582
12	network routing	W= 11948
13	network analysers	W= 10403
14	cascade networks	W= 8428
15	network analysis	W= 8134
16	multiport networks	W= 4968
17	active networks	W= 2688
18	network parameters	W= 2490
19	optical publishing	W= 2035
20	information retrieval	W= 1593
21	networks (circuits)	W= 594
22	coupled circuits	W= 300
23	circuit theory	W= 176
24	equalisers	W= 37
25	database management systems	W= -2420

Selected Source Terms: computer networks and CD-ROMs (II.vi)

Appendix D

Top 10 Batches: Experiment 1

User 1-Search terms: expert systems education

```
Total Weight for Batch 5   is 337
Total Weight for Batch 6   is 330
Total Weight for Batch 27  is 248
Total Weight for Batch 4   is 242
Total Weight for Batch 1   is 212
Total Weight for Batch 10  is 189
Total Weight for Batch 11  is 180
Total Weight for Batch 26  is 146
Total Weight for Batch 3   is 106
Total Weight for Batch 9   is 82
```

User 2-Search terms: tracking noise edge

```
Total Weight for Batch 16  is 187
Total Weight for Batch 26  is 187
Total Weight for Batch 10  is 149
Total Weight for Batch 7   is 145
Total Weight for Batch 18  is 144
Total Weight for Batch 13  is 143
Total Weight for Batch 11  is 142
Total Weight for Batch 23  is 142
Total Weight for Batch 30  is 142
Total Weight for Batch 20  is 138
```

User 3-Search terms: hypertext technical manual database

```
Total Weight for Batch 3   is 174
Total Weight for Batch 1   is 149
Total Weight for Batch 7   is 138
Total Weight for Batch 14  is 137
Total Weight for Batch 10  is 136
Total Weight for Batch 6   is 134
Total Weight for Batch 0   is 133
Total Weight for Batch 19  is 125
Total Weight for Batch 5   is 124
Total Weight for Batch 2   is 123
```

User 4-Search terms: conceptual graphical query language

```
Total Weight for Batch 1   is 145
Total Weight for Batch 14  is 145
Total Weight for Batch 4   is 143
Total Weight for Batch 10  is 142
Total Weight for Batch 11  is 134
Total Weight for Batch 61  is 128
Total Weight for Batch 31  is 127
Total Weight for Batch 0   is 124
Total Weight for Batch 57  is 123
Total Weight for Batch 16  is 120
```

User 5-Search terms: texture detection fractals

Total Weight for Batch 52 is 149
Total Weight for Batch 49 is 142
Total Weight for Batch 41 is 138
Total Weight for Batch 40 is 137
Total Weight for Batch 51 is 136
Total Weight for Batch 48 is 135
Total Weight for Batch 46 is 133
Total Weight for Batch 4 is 127
Total Weight for Batch 3 is 126
Total Weight for Batch 50 is 117

User 6-Search terms: online information evaluation quality reliability

Total Weight for Batch 4 is 181
Total Weight for Batch 51 is 174
Total Weight for Batch 44 is 168
Total Weight for Batch 38 is 162
Total Weight for Batch 42 is 161
Total Weight for Batch 52 is 147
Total Weight for Batch 41 is 143
Total Weight for Batch 45 is 143
Total Weight for Batch 14 is 136
Total Weight for Batch 39 is 135

User 7- Search terms: polarisation mqw splitter

Total Weight for Batch 91 is 527
Total Weight for Batch 92 is 493
Total Weight for Batch 102 is 469
Total Weight for Batch 95 is 440
Total Weight for Batch 103 is 435
Total Weight for Batch 2 is 431
Total Weight for Batch 50 is 431
Total Weight for Batch 57 is 405
Total Weight for Batch 51 is 397
Total Weight for Batch 76 is 373

User 8-Search terms: cd-rom networking

```
Total Weight for Batch 41  is 248
Total Weight for Batch 20  is 212
Total Weight for Batch 43  is 203
Total Weight for Batch 12  is 174
Total Weight for Batch 13  is 169
Total Weight for Batch 22  is 167
Total Weight for Batch 33  is 165
Total Weight for Batch 28  is 159
Total Weight for Batch 42  is 150
Total Weight for Batch 21  is 114
```

Appendix E

User Term Selection Characteristics: Experiment 1

Number on the left of a term indicate its rank (importance) as given by the user. Letter "N" after a number indicates that the corresponding term is marked as "representing new idea" by the user

User 1-Search terms: expert systems education

administrative data processing	
behavioural sciences computing	
computer aided instruction	
computer applications	
education	3
educational administrative data processing	
educational computing	4
electronic mail	
expert systems	2
explanation	3
group decision support systems	
human factors	
intelligent tutoring systems	1
knowledge based systems	5
social sciences	
social sciences computing	
teaching	6 N
teleconferencing	
user interfaces	8 N
user modelling	7 N

User 2-Search terms: tracking noise edge

array signal processing	
computer vision	4
discrete cosine transforms	
distance measurement	
edge detection	3
feature extraction	3
image processing	5
image recognition	6
laser ranging	
multidimensional digital filters	
navigation	
optical radar	
pattern recognition	2
radar	
signal detection	
signal processing	
tracking	1
video signals	7
wavelet transforms	

User 3-Search terms: hypertext technical manual database

application generators	
computer evaluation	
computer software	
computers	
data handling	
database management systems	
databases	8
document image processing	
electronic publishing	6 N
entity-relationship modelling	
hypermedia	1
information services	
integrated software	
multimedia systems	2 N
object-oriented databases	7
object-oriented methods	
object-oriented programming	
programming	
programming languages	
query languages	
relational databases	
system documentation	4
systems analysis	
technical support services	5 N
user manuals	3

User 4-Search terms: conceptual graphical query language

SQL	4 N
application generators	
cartography	
computer graphics	
computers	
database management systems	
fourth-generation languages	
geographic information systems	
graphical user interfaces	5
high level languages	
programming	
programming languages	
query languages	1
query processing	
relational databases	3 N
specification languages	
user interfaces	6
visual languages	2
visual programming	

User 5-Search terms: texture detection fractals

computational geometry	
computer graphics	
computer peripheral equipment	
computer vision	
feature extraction	3
fractals	2
geometry	
image processing	
image recognition	
image texture	1
mathematical morphology	
pattern recognition	3
ray tracing	
rendering (computer graphics)	
topology	

User 6-Search terms: online information evaluation quality reliability

CD-ROMs	3
DP management	4 N
computer communications software	
computer installation	
computer software	
information retrieval system evaluation	
information retrieval systems	
information science	1 N
information services	2
information systems	
management	
management information systems	5 N
online front-ends	
operations research	
program testing	
programming	
public information systems	6 N
reliability	
software engineering	
software maintenance	
software metrics	
software quality	
software reliability	
storage media	
system documentation	
technical support services	

User 7- Search terms: polarisation mqw splitter

Faraday effect
acousto-optical effects
birefringence
electromagnetic wave polarisation
electromagnetic waves
light
light polarisation
magneto-optical effects
modulation
optical elements
optical instruments
optical modulation
optical polarisers
optical prisms
optical properties of substances
optical variables measurement
optics
polarimeters
polarimetry
polarisation 1

User 8-Search terms: cd-rom networking

CD-ROMs	2
ISDN	
cable television	
community antenna television	
computer communications software	
computer networks	3
data communication systems	
electronic publishing	
frame relay	
information retrieval	
information retrieval systems	
multimedia systems	
network operating systems	1
online front-ends	
optical publishing	4
telecommunication networks	
television equipment	
video and audio discs	

Appendix F

User Term Selection Characteristics - Linked terms (Batches): Experiment 1

Letters "A" to "H" after batch numbers represent the corresponding categories given in *Appendix A: User's Term Selection Characteristics - Linked Terms (Batches)*

User 1-Search terms: expert systems education

Batch 5: D

0 expert systems
1 computer applications
2 social sciences computing
3 educational computing
4 educational administrative data processing
5 education

Batch 6: D

0 expert systems
1 computer applications
2 administrative data processing
3 educational administrative data processing
4 educational computing
5 education

Batch 27: A

0 expert systems
1 knowledge based systems
2 intelligent tutoring systems
3 computer aided instruction
4 educational computing
5 education

Batch 4: F

0 expert systems
1 computer applications
2 social sciences computing
3 educational computing
4 computer aided instruction
5 education

Batch 1: D

0 expert systems
1 computer applications
2 behavioural sciences computing
3 social sciences computing
4 educational computing
5 education

Batch 10: D

0 expert systems
1 group decision support systems
2 teleconferencing
3 administrative data processing
4 educational administrative data processing
5 education

Batch 11: D

0 expert systems
1 group decision support systems
2 electronic mail
3 administrative data processing
4 educational administrative data processing
5 education

Batch 26: A

0 expert systems
1 knowledge based systems
2 intelligent tutoring systems
3 computer aided instruction
4 teaching
5 education

Batch 3: C

0 expert systems
1 computer applications
2 social sciences computing
3 social sciences
4 teaching
5 education

Batch 9: F

0 expert systems
1 explanation
2 user modelling
3 user interfaces
4 human factors
5 education

User 2-Search terms: tracking noise edge

Batch 16: C,D

0 edge detection
1 image recognition
2 computer vision
3 laser ranging
4 optical radar
5 radar
6 tracking

Batch 26: C,D

0 edge detection
1 image recognition
2 image processing
3 laser ranging
4 optical radar
5 radar
6 tracking

Batch 10: F

0 edge detection
1 feature extraction
2 pattern recognition
3 image processing
4 signal processing
5 array signal processing
6 tracking

Batch 7: F

0 edge detection
1 feature extraction
2 image recognition
3 image processing
4 signal processing
5 array signal processing
6 tracking

Batch 18: F,D

0 edge detection
1 image recognition
2 image processing
3 signal processing
4 array signal processing
5 radar
6 tracking

Batch 13: C,F,G

0 edge detection
1 image recognition
2 computer vision
3 image processing
4 signal processing
5 array signal processing
6 tracking

Batch 11: C,F

0 edge detection
1 feature extraction
2 pattern recognition
3 multidimensional digital filters
4 signal processing
5 array signal processing
6 tracking

Batch 23: C,E,F

0 edge detection
1 image recognition
2 image processing
3 discrete cosine transforms
4 signal processing
5 array signal processing
6 tracking

Batch 30: C,G,E,F

0 edge detection
1 image recognition
2 pattern recognition
3 image processing
4 signal processing
5 array signal processing
6 tracking

Batch 20: C,F,G

0 edge detection
1 image recognition
2 image processing
3 video signals
4 signal detection
5 array signal processing
6 tracking

User 3-Search terms: hypertext technical manual database

Batch 3: A

0 user manuals
1 system documentation
2 technical support services
3 information services
4 databases
5 database management systems
6 hypermedia

Batch 6: C

0 user manuals
1 system documentation
2 programming
3 application generators
4 relational databases
5 database management systems
6 hypermedia

Batch 1: C

0 user manuals
1 system documentation
2 systems analysis
3 object-oriented methods
4 object-oriented databases
5 database management systems
6 hypermedia

Batch 0: C

0 user manuals
1 system documentation
2 systems analysis
3 entity-relationship modelling
4 relational databases
5 database management systems
6 hypermedia

Batch 7: C

0 user manuals
1 system documentation
2 programming
3 application generators
4 database management systems
5 multimedia systems
6 hypermedia

Batch 19: C

0 user manuals
1 computer evaluation
2 computers
3 data handling
4 document image processing
5 electronic publishing
6 hypermedia

Batch 14: C

0 user manuals
1 system documentation
2 programming
3 programming languages
4 query languages
5 database management systems
6 hypermedia

Batch 5: C

0 user manuals
1 system documentation
2 programming
3 computer software
4 integrated software
5 database management systems
6 hypermedia

Batch 10: C

0 user manuals
1 system documentation
2 programming
3 object-oriented programming
4 object-oriented databases
5 database management systems
6 hypermedia

Batch 2: C

0 user manuals
1 system documentation
2 systems analysis
3 programming
4 application generators
5 database management systems
6 hypermedia

User 4-Search terms: conceptual graphical query language

Batch 0: A

0 query languages
1 query processing
2 database management systems
3 fourth-generation languages
4 user interfaces
5 graphical user interfaces

Batch 1: A

0 query languages
1 query processing
2 database management systems
3 application generators
4 user interfaces
5 graphical user interfaces

Batch 4: A

0 query languages
1 specification languages
2 high level languages
3 visual languages
4 visual programming
5 graphical user interfaces

Batch 10: A

0 query languages
1 SQL
2 relational databases
3 application generators
4 user interfaces
5 graphical user interfaces

Batch 11: A

0 query languages
1 database management systems
2 relational databases
3 application generators
4 user interfaces
5 graphical user interfaces

Batch 14: C

0 query languages
1 database management systems
2 geographic information systems
3 cartography
4 computer graphics
5 graphical user interfaces

Batch 16: D

0 query languages
1 database management systems
2 application generators
3 programming
4 visual programming
5 graphical user interfaces

Batch 31: A

0 query languages
1 fourth-generation languages
2 high level languages
3 visual languages
4 visual programming
5 graphical user interfaces

Batch 57: E

0 query languages
1 programming languages
2 computers
3 computer graphics
4 visual programming
5 graphical user interfaces

Batch 61: A

0 query languages
1 programming languages
2 high level languages
3 visual languages
4 visual programming
5 graphical user interfaces

User 5-Search terms: texture detection fractals

Batch 52: A

0 fractals
1 mathematical morphology
2 pattern recognition
3 feature extraction
4 image recognition
5 image texture

Batch 48: A

0 fractals
1 mathematical morphology
2 image processing
3 computer vision
4 image recognition
5 image texture

Batch 49: C

0 fractals
1 mathematical morphology
2 image processing
3 pattern recognition
4 image recognition
5 image texture

Batch 46: A

0 fractals
1 mathematical morphology
2 geometry
3 computational geometry
4 computer graphics
5 image texture

Batch 41: C

0 fractals
1 geometry
2 mathematical morphology
3 pattern recognition
4 image recognition
5 image texture

Batch 4: D

0 fractals
1 computer graphics
2 ray tracing
3 rendering (computer graphics)
4 computer graphics
5 image texture

Batch 40: D

0 fractals
1 geometry
2 mathematical morphology
3 image processing
4 image recognition
5 image texture

Batch 3: D

0 fractals
1 topology
2 mathematical morphology
3 image processing
4 image recognition
5 image texture

Batch 51: A

0 fractals
1 mathematical morphology
2 pattern recognition
3 computer vision
4 image recognition
5 image texture

Batch 50: H

0 fractals
1 mathematical morphology
2 pattern recognition
3 computer peripheral equipment
4 computer graphics
5 image texture

User 6-Search terms: online information evaluation quality reliability

Batch 4: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 CD-ROMs
3 storage media
4 computer installation
5 DP management
6 software quality
7 software reliability

Batch 52: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 public information systems
3 management information systems
4 management
5 operations research
6 reliability
7 software reliability

Batch 51: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 public information systems
3 management information systems
4 management
5 DP management
6 software quality
7 software reliability

Batch 41: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 online front-ends
3 computer communications software
4 computer software
5 software engineering
6 software maintenance
7 software reliability

Batch 44: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 online front-ends
3 computer communications software
4 computer software
5 software engineering
6 software quality
7 software reliability

Batch 45: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 online front-ends
3 computer communications software
4 computer software
5 programming
6 program testing
7 software reliability

Batch 38: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 information systems
3 management information systems
4 management
5 DP management
6 software quality
7 software reliability

Batch 14: A

0 information retrieval system evaluation
1 information retrieval systems
2 information science
3 information services
4 technical support services
5 system documentation
6 programming
7 software reliability

Batch 42: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 online front-ends
3 computer communications software
4 computer software
5 software engineering
6 software metrics
7 software reliability

Batch 39: D,E

0 information retrieval system evaluation
1 information retrieval systems
2 information systems
3 management information systems
4 management
5 operations research
6 reliability
7 software reliability

User 7- Search terms: polarisation mqw splitter

Batch 91: B

0 polarisation
1 polarimetry
2 electromagnetic wave polarisation
3 light polarisation
4 optical polarisers
5 optical elements

Batch 92: C

0 polarisation
1 polarimetry
2 electromagnetic wave polarisation
3 light polarisation
4 optical prisms
5 optical elements

Batch 102: C

0 polarisation
1 polarimetry
2 polarimeters
3 light polarisation
4 optical polarisers
5 optical elements

Batch 95: C

0 polarisation
1 polarimetry
2 optical polarisers
3 light polarisation
4 optical prisms
5 optical elements

Batch 103: C

0 polarisation
1 polarimetry
2 polarimeters
3 light polarisation
4 optical prisms
5 optical elements

Batch 2: A

0 polarisation
1 electromagnetic wave polarisation
2 light polarisation
3 light
4 optics
5 optical elements

Batch 50: C

0 polarisation
1 magneto-optical effects
2 birefringence
3 light polarisation
4 optical polarisers
5 optical elements

Batch 51: C

0 polarisation
1 magneto-optical effects
2 birefringence
3 light polarisation
4 optical prisms
5 optical elements

Batch 57: B

0 polarisation
1 magneto-optical effects
2 Faraday effect
3 light polarisation
4 optical polarisers
5 optical elements

Batch 76: C

0 polarisation
1 polarimeters
2 light polarisation
3 light
4 optics
5 optical elements

User 8-Search terms: cd-rom networking

Batch 41: C

0 CD-ROMs
1 optical publishing
2 multimedia systems
3 ISDN
4 telecommunication networks
5 computer networks

Batch 20: D

0 CD-ROMs
1 electronic publishing
2 multimedia systems
3 ISDN
4 telecommunication networks
5 computer networks

Batch 43:D

0 CD-ROMs
1 optical publishing
2 multimedia systems
3 ISDN
4 frame relay
5 computer networks

Batch 12: E

0 CD-ROMs
1 video and audio discs
2 television equipment
3 cable television
4 telecommunication networks
5 computer networks

Batch 13: D

0 CD-ROMs
1 video and audio discs
2 television equipment
3 community antenna television
4 telecommunication networks
5 computer networks

Batch 22: D

0 CD-ROMs
1 electronic publishing
2 multimedia systems
3 ISDN
4 frame relay
5 computer networks

Batch 33: C

0 CD-ROMs
1 information retrieval systems
2 online front-ends
3 computer communications software
4 network operating systems
5 computer networks

Batch 28: C

0 CD-ROMs
1 information retrieval
2 online front-ends
3 computer communications software
4 network operating systems
5 computer networks

Batch 42: F

0 CD-ROMs
1 optical publishing
2 multimedia systems
3 ISDN
4 data communication systems
5 computer networks

Batch 21: C

0 CD-ROMs
1 electronic publishing
2 multimedia systems
3 ISDN
4 data communication systems
5 computer networks

Appendix G

Users Relevance Judgements: Experiment 1

The numbers in columns "Batch1" to "Batch5" represent the position of the document in the corresponding "Doc. No" column among the documents retrieved by that batch. 0 represents rank 1. When there is no number, it indicates that the corresponding document is not among the first 500 documents retrieved by that batch. For example, B5_0 indicates that document with the id no. 4274065 is ranked at position 1 by Batch 5, B2_ represents that the same document is not among the first 500 documents retrieved by Batch 2, and B4_12 indicates that the same document is ranked at position 13 by Batch 4

User 1-Search terms: expert systems education

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3528226	B1_11	B2_8	B3_	B4_	B5_478
3558461	B1_13	B2_10	B3_	B4_	B5_480
3592989	B1_18	B2_15	B3_	B4_	B5_485
3625286	B1_143	B2_127	B3_19	B4_82	B5_33
3662220	B1_16	B2_13	B3_	B4_	B5_484
3662223	B1_17	B2_14	B3_215	B4_205	B5_91
3772588	B1_15	B2_12	B3_235	B4_220	B5_93
3777358	B1_8	B2_6	B3_188	B4_180	B5_88
3794341	B1_30	B2_	B3_	B4_276	B5_15
3842154	B1_144	B2_3	B3_103	B4_83	B5_20
3921963	B1_7	B2_0	B3_	B4_	B5_42
3980353	B1_106	B2_91	B3_12	B4_13	B5_23
4010864	B1_9	B2_7	B3_	B4_	B5_476
4011758	B1_101	B2_85	B3_11	B4_11	B5_22
4012572	B1_1	B2_2	B3_2	B4_1	B5_19
4035340	B1_81	B2_66	B3_6	B4_7	B5_157
4035721	B1_20	B2_17	B3_	B4_	B5_488
4053640	B1_90	B2_76	B3_9	B4_9	B5_174
4078153	B1_23	B2_20	B3_	B4_	B5_494
4083071	B1_122	B2_106	B3_13	B4_14	B5_233
4085154	B1_120	B2_104	B3_14	B4_15	B5_242
4087708	B1_89	B2_75	B3_8	B4_8	B5_173
4203359	B1_97	B2_80	B3_10	B4_10	B5_194
4203986	B1_63	B2_53	B3_4	B4_5	B5_147
4205089	B1_57	B2_48	B3_3	B4_3	B5_134
4221389	B1_21	B2_18	B3_263	B4_249	B5_96
4238107	B1_194	B2_181	B3_20	B4_19	B5_32
4238212	B1_0	B2_1	B3_64	B4_32	B5_43
4239833	B1_22	B2_19	B3_	B4_	B5_493
4274065	B1_114	B2_	B3_	B4_12	B5_0
4299652	B1_19	B2_16	B3_	B4_	B5_486
4301666	B1_71	B2_58	B3_5	B4_6	B5_148
4336062	B1_129	B2_112	B3_0	B4_71	B5_14
4378206	B1_	B2_	B3_7	B4_	B5_165
4436746	B1_14	B2_11	B3_	B4_	B5_482

User 2-Search terms: tracking noise edge

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3601839	B1_10	B2_58	B3_	B4_	B5_51
4304623	B1_222	B2_15	B3_27	B4_34	B5_76
4310485	B1_14	B2_11	B3_221	B4_28	B5_59
4310990	B1_421	B2_53	B3_3	B4_8	B5_23
4336867	B1_79	B2_74	B3_91	B4_11	B5_28
4337820	B1_249	B2_17	B3_29	B4_37	B5_78
4343398	B1_	B2_	B3_1	B4_24	B5_16
4361463	B1_21	B2_14	B3_19	B4_1	B5_10
4361464	B1_25	B2_22	B3_26	B4_2	B5_12
4366020	B1_44	B2_156	B3_15	B4_23	B5_15
4367996	B1_47	B2_32	B3_36	B4_248	B5_9
4377174	B1_72	B2_57	B3_81	B4_9	B5_24
4386403	B1_8	B2_7	B3_14	B4_22	B5_49
4388727	B1_137	B2_12	B3_21	B4_29	B5_63
4392533	B1_3	B2_1	B3_4	B4_38	B5_3
4395056	B1_215	B2_16	B3_28	B4_35	B5_77
4398171	B1_63	B2_38	B3_55	B4_4	B5_19
4403833	B1_64	B2_39	B3_56	B4_5	B5_20
4426057	B1_122	B2_9	B3_17	B4_26	B5_55
4458241	B1_70	B2_49	B3_73	B4_7	B5_22
4476974	B1_9	B2_51	B3_0	B4_0	B5_1
4478143	B1_15	B2_82	B3_	B4_	B5_60
4478650	B1_30	B2_132	B3_12	B4_20	B5_13

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
4286647	B1_148	B2_88	B3_20	B4_143	B5_18
4292437	B1_52	B2_18	B3_311	B4_39	B5_27
4295899	B1_5	B2_43	B3_	B4_95	B5_43
4301169	B1_2	B2_2	B3_2	B4_3	B5_17
4307387	B1_19	B2_91	B3_	B4_147	B5_65
4320315	B1_23	B2_112	B3_9	B4_17	B5_11
4322807	B1_34	B2_27	B3_	B4_	B5_14
4333049	B1_140	B2_126	B3_10	B4_18	B5_46
4333759	B1_7	B2_48	B3_71	B4_6	B5_5
4336363	B1_17	B2_85	B3_	B4_134	B5_61
4359473	B1_18	B2_83	B3_	B4_132	B5_62
4361465	B1_1	B2_3	B3_104	B4_14	B5_2
4449551	B1_127	B2_10	B3_18	B4_27	B5_58
4461862	B1_4	B2_6	B3_7	B4_15	B5_40
4474211	B1_6	B2_44	B3_	B4_96	B5_45
4483111	B1_16	B2_78	B3_98	B4_12	B5_6
4489275	B1_138	B2_84	B3_6	B4_13	B5_7

User 3-Search terms: hypertext technical manual database

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3496017	B1_162	B2_172	B3_150	B4_12	B5_31
3706850	B1_124	B2_14	B3_116	B4_126	B5_33
3754732	B1_10	B2_53	B3_49	B4_48	B5_13
3755142	B1_4	B2_34	B3_31	B4_30	B5_6
3766889	B1_14	B2_7	B3_6	B4_5	B5_19
3981759	B1_6	B2_1	B3_2	B4_2	B5_8
4165233	B1_18	B2_13	B3_13	B4_13	B5_32
4166283	B1_77	B2_9	B3_64	B4_69	B5_24
4244029	B1_2	B2_11	B3_11	B4_9	B5_2

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3533416	B1_140	B2_154	B3_131	B4_11	B5_29
3706850	B1_124	B2_14	B3_116	B4_126	B5_33
3754731	B1_0	B2_0	B3_0	B4_0	B5_0
3754737	B1_16	B2_12	B3_12	B4_10	B5_27
3864689	B1_19	B2_15	B3_14	B4_14	B5_34
3965687	B1_15	B2_8	B3_9	B4_6	B5_23
4006468	B1_20	B2_16	B3_15	B4_15	B5_35
4008314	B1_12	B2_5	B3_4	B4_4	B5_17
4076897	B1_167	B2_23	B3_8	B4_165	B5_9
4122485	B1_89	B2_82	B3_7	B4_85	B5_21
4292357	B1_64	B2_56	B3_5	B4_52	B5_18

User 4-Search terms: conceptual graphical query language

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3774638	B1_5	B2_16	B3_99	B4_36	B5_18
3800846	B1_67	B2_183	B3_131	B4_6	B5_58
3863165	B1_196	B2_167	B3_19	B4_	B5_43
3983581	B1_86	B2_26	B3_7	B4_82	B5_14
4038640	B1_21	B2_32	B3_18	B4_1	B5_29
4235260	B1_14	B2_22	B3_56	B4_74	B5_84
4345409	B1_16	B2_24	B3_2	B4_90	B5_6
4353319	B1_52	B2_498	B3_1	B4_	B5_1
4353343	B1_34	B2_38	B3_5	B4_118	B5_10
4353345	B1_7	B2_113	B3_24	B4_	B5_2

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3600893	B1_2	B2_27	B3_61	B4_21	B5_40
3624855	B1_43	B2_92	B3_82	B4_4	B5_50
3625296	B1_30	B2_29	B3_62	B4_3	B5_7
3639215	B1_99	B2_34	B3_71	B4_18	B5_32
3796497	B1_3	B2_13	B3_74	B4_28	B5_13
3814488	B1_10	B2_18	B3_9	B4_9	B5_67
3885542	B1_0	B2_5	B3_13	B4_11	B5_23
3985376	B1_1	B2_7	B3_16	B4_15	B5_30
4394640	B1_4	B2_84	B3_65	B4_17	B5_11
4465254	B1_	B2_	B3_388	B4_7	B5_60

User 5-Search terms: texture detection fractals

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
4143861	B1_40	B2_38	B3_7	B4_23	B5_10
4285014	B1_34	B2_8	B3_25	B4_24	B5_11
4438930	B1_47	B2_60	B3_189	B4_63	B5_19
4456118	B1_18	B2_17	B3_16	B4_15	B5_22
4471518	B1_8	B2_9	B3_8	B4_8	B5_13
4471946	B1_7	B2_42	B3_33	B4_36	B5_12

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3545746	B1_17	B2_16	B3_15	B4_32	B5_21
4311071	B1_12	B2_13	B3_12	B4_13	B5_17
4337776	B1_3	B2_5	B3_4	B4_5	B5_6
4341486	B1_2	B2_4	B3_3	B4_10	B5_5
4367604	B1_19	B2_18	B3_17	B4_16	B5_23
4367605	B1_11	B2_12	B3_11	B4_12	B5_16
4367606	B1_1	B2_2	B3_0	B4_0	B5_0
4391264	B1_4	B2_6	B3_5	B4_6	B5_7
4422294	B1_5	B2_7	B3_6	B4_7	B5_8
4468930	B1_10	B2_11	B3_10	B4_11	B5_15
4471520	B1_0	B2_0	B3_1	B4_1	B5_1

User 6-Search terms: online information evaluation quality reliability

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3579095	B1_302	B2_12	B3_126	B4_13	B5_25
3770222	B1_403	B2_18	B3_	B4_19	B5_47
4478756	B1_9	B2_155	B3_106	B4_164	B5_17

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3602391	B1_17	B2_223	B3_164	B4_230	B5_31
3794685	B1_	B2_	B3_19	B4_	B5_38
3814168	B1_16	B2_215	B3_155	B4_222	B5_30
4304032	B1_0	B2_1	B3_1	B4_1	B5_4

User 7- Search terms: polarisation mqw splitter

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
4488533	B1_21	B2_17	B3_27	B4_22	B5_28

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3809140	B1_4	B2_1	B3_5	B4_5	B5_6
4053074	B1_19	B2_15	B3_25	B4_20	B5_26

User 8-Search terms: cd-rom networking

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3642382	B1_	B2_	B3_	B4_12	B5_88
3750650	B1_	B2_140	B3_	B4_37	B5_9
3967731	B1_8	B2_16	B3_8	B4_91	B5_36
4128148	B1_164	B2_18	B3_167	B4_	B5_38
4190990	B1_63	B2_0	B3_59	B4_	B5_15
4254710	B1_78	B2_3	B3_75	B4_81	B5_21
4286363	B1_6	B2_14	B3_6	B4_82	B5_34
4304021	B1_0	B2_173	B3_0	B4_66	B5_2
4370682	B1_3	B2_245	B3_3	B4_	B5_5
4385334	B1_12	B2_	B3_12	B4_420	B5_42
4400371	B1_14	B2_	B3_14	B4_	B5_44

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3554583	B1_67	B2_1	B3_63	B4_72	B5_17
4252724	B1_5	B2_13	B3_5	B4_67	B5_33
4492775	B1_11	B2_	B3_11	B4_416	B5_41

Appendix H

Exact Matching Terms: Experiment 2

The alphanumeric characters in brackets after exact matching terms indicate the number of the heuristic, in section 7.3.1.4, applied

User 1-Search terms: object database benchmarks

1 GGD objects
2 benchmark testing
3 database languages
4 database management systems
5 database querying
6 database theory
7 databases
8 databases, online
9 deductive databases
10 distributed databases
11 extended objects
12 factographic databases
13 federated databases
14 hierarchical databases
15 image databases
16 information retrieval
17 information retrieval systems
18 information services
19 intelligent databases
20 nebulae
21 network databases
22 object-oriented databases
23 object-oriented languages
24 object-oriented methods
25 object-oriented programming
26 online databases
27 performance evaluation
28 pictorial databases
29 quasars
30 quasi-stellar objects
31 query languages
32 relational databases
33 replicated databases
34 spatial databases
35 stars
36 temporal databases
37 visual databases

Exact Matching Terms: None

User 2-Search terms: computer vision detection

1 ENDOR
2 acoustic variables measurement
3 air tightness detection
4 artificial vision
5 color vision
6 colour vision
7 computer simulation by computers
8 computer vision
9 crack detection
10 demodulation
11 detection demodulation
12 differential detection
13 edge detection
14 error detection
15 error detection codes
16 feature detection
17 feature extraction
18 flaw detection
19 heterodyne detection
20 image intensifiers
21 image sensors
22 infrared imaging
23 isotope detection
24 leak detection
25 machine vision
26 neutrino detection and measurement
27 night vision
28 optical detection of ENDOR
29 optical double resonance
30 pitch detection
31 pollution detection and control
32 proton detection and measurement
33 radiation detection and measurement
34 robot vision
35 signal detection
36 stereo image processing
37 stereo vision
38 virtual machines
39 vision
40 vision defects

Exact Matching Terms: None

User 3-Search terms: hypertext and internet

1 Internet
2 computer networks
3 hypermedia
4 hypertext
5 internetworking

Exact Matching Terms: computer networks (preferred term for "internet"),
hypermedia (preferred term for "hypertext"),
internetworking (preferred term for "internet")
(I.iii-a)

User 4-Search terms: UV spectroscopy database

1 UV spectroscopy
2 computerised spectroscopy
3 database languages
4 database machines
5 database management systems
6 database querying
7 database theory
8 electron spectroscopy
9 electronic spectroscopy
10 information retrieval
11 infrared spectroscopy
12 interference spectroscopy
13 mass spectroscopy
14 modulation spectroscopy
15 multiphoton spectroscopy
16 neutron spectroscopy
17 optical spectroscopy
18 optoacoustic spectroscopy
19 optogalvanic spectroscopy
20 optothermal spectroscopy
21 photoacoustic spectroscopy
22 photoelectron spectroscop
23 photogalvanic spectroscopy
24 photothermal spectroscopy
25 query languages
26 radiofrequency spectroscopy
27 special purpose computers
28 spectroscopy
29 spectroscopy computing
30 tunneling spectroscopy
31 tunnelling spectroscopy
32 ultraviolet spectroscopy
33 visible spectroscopy

Exact Matching Terms: None

User 5-Search terms: impact information technology disabled

1 FIB technology
2 chemical technology
3 collision processes
4 computer applications
5 digital computers
6 disabled persons' aids
7 electron impact
8 factory automation
9 focused ion beam technology
10 fracture toughness
11 geophysical catastrophes
12 handicapped aids
13 impact
14 impact craters
15 impact events
16 impact ionisation
17 impact ionization
18 impact mechanical
19 impact phenomena
20 impact strength
21 impact structures
22 impact testing
23 impact toughness
24 information retrieval
25 information science
26 information services
27 information storage
28 information systems
29 information technology
30 information theory
31 information use
32 ion impact
33 ion-surface impact
34 mechanical impact
35 meteorite craters
36 office automation
37 oil technology
38 positron impact
39 powder technology
40 semiconductor technology
41 technology transfer
42 telecommunication

Exact Matching Terms: None

User 6-Search terms: neural water pollution

1 Hopfield neural nets
2 air pollution
3 atmospheric humidity
4 atmospheric pollution
5 atmospheric water vapour
6 boilers
7 cooling towers
8 desalination
9 electric breakdown
10 feedback neural nets
11 feedforward neural nets
12 heavy water
13 learning artificial intelligence
14 light pollution
15 light water
16 neural chips
17 neural nets
18 ocean water
19 optical neural nets
20 pollution
21 pollution detection and control
22 radioactive pollution
23 recurrent neural nets
24 salt water conversion
25 seawater
26 sky brightness
27 training neural nets
28 treatment, water
29 water
30 water boilers
31 water conditioning
32 water cooling towers
33 water pollution
34 water pollution detection and control
35 water purification
36 water supply
37 water treatment
38 water trees

Exact Matching Terms: None

User 7-Search terms: optical fiber position

1 carbon fiber reinforced composites
2 carbon fiber reinforced plastics
3 carbon fibre reinforced composites
4 carbon fibre reinforced plastics
5 fiber laser amplifiers
6 fiber lasers
7 fiber optic cables
8 fiber optic gyroscopes
9 fiber optic sensors
10 fiber optical waveguides
11 fiber optics
12 fiber reinforced composites
13 fibre lasers
14 fibre optic sensors
15 fibre reinforced composites
16 glass fiber reinforced composites
17 glass fiber reinforced plastics
18 glass fibre reinforced composites
19 glass fibre reinforced plastics
20 gyroscopes
21 navigation
22 optical cables
23 optical fiber cables
24 optical fiber fabrication
25 optical fiber lasers
26 optical fiber losses
27 optical fiber sensors
28 optical fiber testing
29 optical fiber theory
30 optical fibers
31 optical fibre fabrication
32 optical fibre testing
33 optical fibre theory
34 optical fibres
35 optical losses
36 optical polarimeters
37 optical sensors
38 optical susceptibility
39 optical windows
40 polarimeters
41 position control
42 position finding
43 position measurement
44 position sensitive particle detectors
45 pulse position modulation
46 quenching optical
47 radiation quenching
48 susceptibility, optical
49 windows, optical

Exact Matching Terms: None

User 8-Search terms: expert systems object oriented development

1 Vienna development method
2 activity-oriented simulation
3 concurrent engineering
4 design engineering
5 development management
6 development systems
7 development, photographic
8 diagnostic expert systems
9 discrete event simulation
10 event-oriented simulation
11 high level languages
12 machine oriented languages
13 medical expert systems
14 microcomputer development systems
15 object-oriented databases
16 object-oriented languages
17 object-oriented methods
18 object-oriented programming
19 photographic development
20 photographic process
21 problem oriented languages
22 procedure oriented languages
23 process-oriented simulation
24 product development
25 program development
26 research and development management
27 software development
28 software engineering
29 systems software
30 telecommunication systems
31 telegraph systems
32 telemetering systems
33 telephone systems
34 temporal databases
35 time-oriented databases
36 user interface development systems
37 user interface management systems

Exact matching Terms: None

Appendix I

Term Ranks and Selection of the Source Terms: Experiment 2

The alphanumeric characters in brackets after selected source terms indicate the number of the heuristic, in section 7.3.1.4, applied

User 1-Search terms: object database benchmarks

1. object-oriented databases	W= 284614
2. object-oriented programming	W= 33924
3. database management systems	W= 29971
4. relational databases	W= 27045
5. query languages	W= 16250
6. database theory	W= 14490
7. deductive databases	W= 13468
8. distributed databases	W= 12364
9. visual databases	W= 3528
10. information retrieval	W= 3427
11. object-oriented methods	W= 2898
12. information retrieval systems	W= 2178
13. object-oriented languages	W= 1935
14. temporal databases	W= 756
15. performance evaluation	W= 721
16. quasars	W= 174
17. stars	W= 105
18. factographic databases	W= 26
19. nebulae	W= 0
20. extended objects	W= 0
21. information services	W= -120

Selected Source Terms: object-oriented databases and performance evaluation (II.vi)

User 2-Search terms: computer vision detection

1. computer vision	W= 15709
2. edge detection	W= 2412
3. feature extraction	W= 570
4. flaw detection	W= 288
5. stereo image processing	W= 288
6. vision	W= 135
7. vision defects	W= 120
8. colour vision	W= 50
9. crack detection	W= 36
10. radiation detection and measurement	W= 16
11. ENDOR	W= 0
12. image sensor	W= 0
13. isotope detection	W= 0
14. neutrino detection and measurement	W= 0
15. optical double resonance	W= 0
16. proton detection and measurement	W= 0
17. acoustic variables measurement	W= -0
18. demodulation	W= -0
19. error detection codes	W= -0
20. image intensifiers	W= -0
21. leak detection	W= -0
22. virtual machines	W= -0
23. pollution detection and control	W= -5
24. infrared imaging	W= -18
25. error detection	W= -23
26. signal detection	W= -104

Selected Source Terms: computer vision and edge detection (II.vi)

User 3-Search terms: hypertext and internet

1. hypermedia W= 95772
2. computer networks W= 7953
3. internetworking W= 2881

Selected Source Terms: hypermedia and computer networks (II.v)

User 4-Search terms: UV spectroscopy database

1	spectroscopy computing	W= 62928
2	computerised spectroscopy	W= 39025
3	infrared spectroscopy	W= 7050
4	spectroscopy	W= 3976
5	electron spectroscopy	W= 2584
6	mass spectroscopy	W= 2144
7	photoelectron spectroscopy	W= 992
8	ultraviolet spectroscopy	W= 992
9	visible spectroscopy	W= 992
10	neutron spectroscopy	W= 861
11	photothermal spectroscopy	W= 590
12	tunnelling spectroscopy	W= 333
13	modulation spectroscopy	W= 214
14	photoacoustic spectroscopy	W= 214
15	interference spectroscopy	W= 0
16	multiphoton spectroscopy	W= 0
17	optogalvanic spectroscopy	W= 0
18	radiofrequency spectroscopy	W= 0
19	database theory	W= -0
20	query languages	W= -0
21	special purpose computers	W= -0
22	information retrieval	W= -25
23	database management systems	W= -64

Selected Source Terms: spectroscopy computing (II.vi) and
infrared spectroscopy (II.vi & III.i)

User 5-Search terms: impact information technology disabled

1. office automation	W= 1892
2. handicapped aids	W= 1078
3. information science	W= 460
4. telecommunication	W= 440
5. information systems	W= 369
6. factory automation	W= 351
7. technology transfer	W= 301
8. computer applications	W= 265
9. information services	W= 150
10. digital computers	W= 135
11. information storage	W= 58
12. information use	W= 28
13. collision processes	W= 0
14. electron impact	W= 0
15. focused ion beam technology	W= 0
16. fracture toughness	W= 0
17. geophysical catastrophes	W= 0
18. impact (mechanical)	W= 0
19. impact ionisation	W= 0
20. impact strength	W= 0
21. impact testing	W= 0
22. ion-surface impact	W= 0
23. meteorite craters	W= 0
24. oil technology	W= 0
25. powder technology	W= 0
26. semiconductor technology	W= 0
27. chemical technology	W= -0
28. information theory	W= -0
29. information retrieval	W= -11

Selected Source Terms: office automation and handicapped aids (II.vi)

User 6-Search terms: neural water pollution

1.	water pollution detection and control	W= 21160
2.	water pollution	W= 15931
3.	water treatment	W= 3120
4.	pollution detection and control	W= 1615
5.	neural nets	W= 1512
6.	water supply	W= 1280
7.	radioactive pollution	W= 1176
8.	air pollution	W= 952
9.	pollution	W= 790
10.	cooling towers	W= 176
11.	heavy water	W= 99
12.	seawater	W= 71
13.	boilers	W= 64
14.	learning artificial intelligence	W= 45
15.	feedforward neural nets	W= 38
16.	Hopfield neural nets	W= 0
17.	atmospheric humidity	W= 0
18.	desalination	W= 0
19.	electric breakdown	W= 0
20.	neural chips	W= 0
21.	optical neural nets	W= 0
22.	recurrent neural nets	W= 0
23.	sky brightness	W= 0
24.	water	W= 0

Selected Source Terms: water pollution detection and control and neural nets (II.vi)

User 7-Search terms: optical fiber position

1. optical fibres	W= 31620
2. fibre optic sensors	W= 10349
3. optical cables	W= 5984
4. fibre lasers	W= 390
5. optical losses	W= 370
6. position measurement	W= 319
7. fibre reinforced composites	W= 288
8. optical fibre testing	W= 279
9. carbon fibre reinforced plastics	W= 272
10. gyroscopes	W= 270
11. optical fibre theory	W= 208
12. position sensitive particle detectors	W= 96
13. carbon fibre reinforced composites	W= 57
14. position control	W= 57
15. glass fibre reinforced plastics	W= 56
16. polarimeters	W= 54
17. optical sensors	W= 37
18. glass fibre reinforced composites	W= 0
19. optical fibre fabrication	W= 0
20. optical susceptibility	W= 0
21. optical windows	W= 0
22. pulse position modulation	W= 0
23. radiation quenching	W= 0
24. navigation	W= -2

Selected Source Terms: optical fibres and position measurement (II.vi)

User 8-Search terms: expert systems object oriented development

1. object-oriented programming	W= 104650
2. object-oriented databases	W= 19818
3. expert systems	W= 19200
4. software engineering	W= 9145
5. object-oriented methods	W= 9114
6. object-oriented languages	W= 2550
7. high level languages	W= 1826
8. development systems	W= 896
9. discrete event simulation	W= 576
10. diagnostic expert systems	W= 396
11. medical expert systems	W= 341
12. user interface management systems	W= 217
13. Vienna development method	W= 138
14. concurrent engineering	W= 120
15. research and development management	W= 104
16. temporal databases	W= 21
17. design engineering	W= 18
18. telemetering systems	W= 16
19. systems software	W= 12
20. machine oriented languages	W= 0
21. photographic process	W= 0
22. telegraph systems	W= 0
23. telecommunication systems	W= -3
24. telephone systems	W= -3

Selected Source Terms: object-oriented programming and expert systems (II.vi)

Appendix J

Top 10 Batches: Experiment 2

User 1-Search terms: object database benchmarks

```
Total Weight for Batch 0   is 43873
Total Weight for Batch 7   is 36898
Total Weight for Batch 8   is 35501
Total Weight for Batch 9   is 35133
Total Weight for Batch 12  is 33986
Total Weight for Batch 10  is 33955
Total Weight for Batch 11  is 33300
Total Weight for Batch 4   is 30399
Total Weight for Batch 1   is 30169
Total Weight for Batch 2   is 30169
```

User 2-Search terms: computer vision detection

```
Total Weight for Batch 6   is 1281
Total Weight for Batch 5   is 1111
Total Weight for Batch 10  is 835
Total Weight for Batch 9   is 786
Total Weight for Batch 2   is 767
Total Weight for Batch 8   is 581
Total Weight for Batch 22  is 396
Total Weight for Batch 76  is 396
Total Weight for Batch 52  is 301
Total Weight for Batch 24  is 266
```

User 3-Search terms: hypertext and internet

```
Total Weight for Batch 8   is 3438
Total Weight for Batch 6   is 2746
Total Weight for Batch 7   is 2170
Total Weight for Batch 0   is 2109
Total Weight for Batch 4   is 1983
Total Weight for Batch 5   is 1953
Total Weight for Batch 2   is 1899
Total Weight for Batch 3   is 1818
Total Weight for Batch 1   is 1797
Total Weight for Batch 10  is 1709
```

User 4-Search terms: UV spectroscopy database

```
Total Weight for Batch 10  is 50671
Total Weight for Batch 12  is 50171
Total Weight for Batch 11  is 44495
Total Weight for Batch 9   is 44135
Total Weight for Batch 4   is 8054
Total Weight for Batch 2   is 7694
Total Weight for Batch 3   is 7694
Total Weight for Batch 7   is 5684
Total Weight for Batch 6   is 5630
Total Weight for Batch 5   is 5470
```

User 5-Search terms: impact information technology disabled

```
Total Weight for Batch 13  is 1128
Total Weight for Batch 14  is 1098
Total Weight for Batch 10  is 1048
Total Weight for Batch 11  is 1048
Total Weight for Batch 12  is 1048
Total Weight for Batch 6   is 1043
Total Weight for Batch 40  is 1033
Total Weight for Batch 15  is 1022
Total Weight for Batch 8   is 998
Total Weight for Batch 2   is 943
```

User 6-Search terms: neural water pollution

```
Total Weight for Batch 28  is 20753
Total Weight for Batch 24  is 20543
Total Weight for Batch 18  is 19963
Total Weight for Batch 12  is 19051
Total Weight for Batch 27  is 18809
Total Weight for Batch 25  is 18703
Total Weight for Batch 57  is 17703
Total Weight for Batch 63  is 17673
Total Weight for Batch 10  is 17633
Total Weight for Batch 33  is 17633
```

User 7-Search terms: optical fiber position

```
Total Weight for Batch 0   is 2376
Total Weight for Batch 6   is 1645
Total Weight for Batch 2   is 1281
Total Weight for Batch 7   is 811
Total Weight for Batch 5   is 730
Total Weight for Batch 8   is 634
Total Weight for Batch 9   is 484
Total Weight for Batch 1   is 478
Total Weight for Batch 3   is 412
Total Weight for Batch 4   is 359
```

User 8-Search terms: expert systems object oriented development

```
Total Weight for Batch 11  is 57495
Total Weight for Batch 12  is 56856
Total Weight for Batch 7   is 51591
Total Weight for Batch 6   is 44119
Total Weight for Batch 8   is 44119
Total Weight for Batch 10  is 44080
Total Weight for Batch 9   is 43522
Total Weight for Batch 4   is 12989
Total Weight for Batch 22  is 12825
Total Weight for Batch 3   is 12764
```

Appendix K

User Term Selection Characteristics: Experiment 2

Number on the left of a term indicate its rank (importance) as given by the user. Letter "N" after a number indicates that the corresponding term is marked as "representing new idea" by the user

User 1-Search terms: object database benchmarks

algorithm theory	
application generators	
computational complexity	
computer evaluation	
computer selection	
computer testing	
computers	
database management systems	3
database theory	
file organisation	
object-oriented databases	2
object-oriented methods	
object-oriented programming	
operations research	
performance evaluation	1
program debugging	
program testing	
programming	
queueing theory	
search problems	
software engineering	
software maintenance	
software reliability	
systems analysis	

User 2-Search terms: computer vision detection

computer graphics	
computer vision	
edge detection	1
feature extraction	2
image processing	
image recognition	
laser ranging	
mathematical morphology	
multidimensional digital filters	
pattern recognition	3
pattern recognition equipment	
sensor fusion	
signal processing	
speech recognition	
stereo image processing	
tactile sensors	
two-dimensional digital filters	
wavelet transforms	

User 3-Search terms: hypertext and internet

ISDN	
PACS	
computer networks	
concurrency control	
data communication systems	1
database management systems	
database theory	
distributed databases	
distributed processing	
electronic data interchange	
group decision support systems	
hypermedia	2
integrated software	
local area networks	
multimedia systems	3
relational databases	
visual databases	4

User 4-Search terms: UV spectroscopy database

Raman spectra	
Raman spectroscopy	
TR3 spectroscopy	
TRRR spectroscopy	
chemistry computing	1
computerised instrumentation	1
computerised spectroscopy	1
infrared spectroscopy	
laser beam applications	
matrix isolation spectroscopy	
measurement by laser beam	
modulation spectroscopy	1
multiphoton spectroscopy	
physics computing	
spectra	1
spectroscopy	1
spectroscopy applications of computers	1
spectroscopy computing	
time resolved spectroscopy	1

User 5-Search terms: impact information technology disabled

CAD/CAM	
administrative data processing	
computer applications	4
dictation	
electronic mail	
executive workstations	
facsimile	
financial data processing	
handicapped aids	1
integrated software	3
logistics data processing	
manufacturing data processing	
military computing	
office automation	
software packages	
spreadsheet programs	
teleconferencing	2
telephony	2
word processing	3

User 6-Search terms: neural water pollution

aquaculture	
artificial intelligence	4
biocybernetics	
biology	
ecology	
learning systems	
living systems	
natural resources	
neural nets	2
pollution	
radioactive pollution	
water pollution	
water pollution detection and control	1
water supply	
water treatment	3

User 7-Search terms: optical fiber position

SONET
angular measurement
fuzzy control
gradient index optics
loss measurement
measurement
neural nets
optical elements
optical fibre testing
optical fibres 1
optical interconnections
optical loss measurement
optical neural nets
optical testing
optical time-domain reflectometry
optical variables measurement
optics
position measurement
servomechanisms
spatial variables measurement
stroboscopes
synchronisation
testing
time measurement

User 8-Search terms: expert systems object oriented development

CAD	
computer applications	
configuration management	
database management systems	
decision support systems	
deductive databases	
expert systems	3
group decision support systems	
information systems	
intelligent design assistants	
knowledge based systems	
knowledge representation	2
logic programming	5
multimedia systems	
object-oriented databases	7
object-oriented methods	1
object-oriented programming	6
programming	
software engineering	4

Appendix L

User Term Selection Characteristics - Linked terms (Batches): Experiment 2

Letters "A" to "H" after batch numbers represent the corresponding categories given in *Appendix A: User's Term Selection Characteristics - Linked Terms (Batches)*

User 1-Search terms: object database benchmarks

Batch 0: C

0 object-oriented databases
1 database management systems
2 database theory
3 search problems
4 computational complexity
5 performance evaluation

Batch 7: D

0 object-oriented databases
1 object-oriented methods
2 object-oriented programming
3 programming
4 program testing
5 performance evaluation

Batch 8: D

0 object-oriented databases
1 object-oriented programming
2 software engineering
3 software maintenance
4 program testing
5 performance evaluation

Batch 9: D

0 object-oriented databases
1 object-oriented programming
2 software engineering
3 software reliability
4 program testing
5 performance evaluation

Batch 12: D

0 object-oriented databases
1 object-oriented programming
2 programming
3 program debugging
4 program testing
5 performance evaluation

Batch 10: D

0 object-oriented databases
1 object-oriented programming
2 programming
3 software reliability
4 program testing
5 performance evaluation

Batch 11: D

0 object-oriented databases
1 object-oriented programming
2 programming
3 algorithm theory
4 computational complexity
5 performance evaluation

Batch 4: C

0 object-oriented databases
1 database management systems
2 application generators
3 programming
4 program testing
5 performance evaluation

Batch 1: D

0 object-oriented databases
1 database management systems
2 file organisation
3 computers
4 computer evaluation
5 performance evaluation

Batch 2: C

0 object-oriented databases
1 database management systems
2 file organisation
3 computers
4 computer selection
5 performance evaluation

User 2-Search terms: computer vision detection

Batch 6: C

0 edge detection
1 feature extraction
2 image recognition
3 image processing
4 stereo image processing
5 computer vision

Batch 8: C

0 edge detection
1 feature extraction
2 image recognition
3 image processing
4 laser ranging
5 computer vision

Batch 5: C

0 edge detection
1 feature extraction
2 image recognition
3 image processing
4 sensor fusion
5 computer vision

Batch 22: C

0 edge detection
1 feature extraction
2 pattern recognition
3 image processing
4 stereo image processing
5 computer vision

Batch 10: C

0 edge detection
1 feature extraction
2 image recognition
3 pattern recognition
4 sensor fusion
5 computer vision

Batch 76: C

0 edge detection
1 image recognition
2 pattern recognition
3 image processing
4 stereo image processing
5 computer vision

Batch 9: C

0 edge detection
1 feature extraction
2 image recognition
3 image processing
4 pattern recognition
5 computer vision

Batch 52: C

0 edge detection
1 image recognition
2 image processing
3 signal processing
4 sensor fusion
5 computer vision

Batch 2: C

0 edge detection
1 feature extraction
2 speech recognition
3 pattern recognition
4 image recognition
5 computer vision

Batch 24: C

0 edge detection
1 feature extraction
2 pattern recognition
3 image processing
4 laser ranging
5 computer vision

User 3-Search terms: hypertext and internet

Batch 0: D

0 hypermedia
1 database management systems
2 relational databases
3 distributed databases
4 computer networks

Batch 1: D

0 hypermedia
1 database management systems
2 visual databases
3 PACS
4 computer networks

Batch 2: D

0 hypermedia
1 database management systems
2 concurrency control
3 distributed databases
4 computer networks

Batch 3: D

0 hypermedia
1 database management systems
2 concurrency control
3 distributed processing
4 computer networks

Batch 4: E

0 hypermedia
1 database management systems
2 database theory
3 distributed databases
4 computer networks

Batch 5: F

0 hypermedia
1 database management systems
2 distributed databases
3 distributed processing
4 computer networks

Batch 6: C

0 hypermedia
1 database management systems
2 group decision support systems
3 local area networks
4 computer networks

Batch 7: G

0 hypermedia
1 database management systems
2 integrated software
3 electronic data interchange
4 computer networks

Batch 8: C

0 hypermedia
1 multimedia systems
2 database management systems
3 distributed databases
4 computer networks

Batch 10: A

0 hypermedia
1 multimedia systems
2 ISDN
3 data communication systems
4 computer networks

User 4-Search terms: UV spectroscopy database

Batch 10: A

0 spectroscopy computing
1 chemistry computing
2 computerised instrumentation
3 computerised spectroscopy
4 spectroscopy
5 infrared spectroscopy

Batch 12: A

0 spectroscopy computing
1 physics computing
2 computerised instrumentation
3 computerised spectroscopy
4 spectroscopy
5 infrared spectroscopy

Batch 11: C

0 spectroscopy computing
1 computerised spectroscopy
2 spectroscopy
3 laser beam applications
4 Raman spectroscopy
5 infrared spectroscopy

Batch 9: D

0 spectroscopy computing
1 spectroscopy applications of computers
2 computerised spectroscopy
3 spectroscopy
4 Raman spectroscopy
5 infrared spectroscopy

Batch 4: G

0 spectroscopy computing
1 spectroscopy
2 time resolved spectroscopy
3 laser beam applications
4 Raman spectroscopy
5 infrared spectroscopy

Batch 2: G, C

0 spectroscopy computing
1 spectroscopy
2 time resolved spectroscopy
3 TR3 spectroscopy
4 Raman spectroscopy
5 infrared spectroscopy

Batch 3: G,C

0 spectroscopy computing
1 spectroscopy
2 time resolved spectroscopy
3 TRRR spectroscopy
4 Raman spectroscopy
5 infrared spectroscopy

Batch 7: G, C

0 spectroscopy computing
1 spectroscopy
2 modulation spectroscopy
3 laser beam applications
4 Raman spectroscopy
5 infrared spectroscopy

Batch 6: G, C

0 spectroscopy computing
1 spectroscopy
2 measurement by laser beam
3 laser beam applications
4 Raman spectroscopy
5 infrared spectroscopy

Batch 5: C

0 spectroscopy computing
1 spectroscopy
2 matrix isolation spectroscopy
3 laser beam applications
4 Raman spectroscopy
5 infrared spectroscopy

User 5-Search terms: impact information technology disabled

Batch 13: A

0 handicapped aids
1 computer applications
2 administrative data processing
3 electronic mail
4 teleconferencing
5 office automation

Batch 14: A

0 handicapped aids
1 computer applications
2 administrative data processing
3 electronic mail
4 facsimile
5 office automation

Batch 10: A

0 handicapped aids
1 computer applications
2 administrative data processing
3 word processing
4 dictation
5 office automation

Batch 11: C

0 handicapped aids
1 computer applications
2 administrative data processing
3 word processing
4 executive workstations
5 office automation

Batch 12: A

0 handicapped aids
1 computer applications
2 administrative data processing
3 word processing
4 integrated software
5 office automation

Batch 6: E, F

0 handicapped aids
1 computer applications
2 CAD/CAM
3 manufacturing data processing
4 administrative data processing
5 office automation

Batch 40: E,F

0 handicapped aids
1 computer applications
2 military computing
3 logistics data processing
4 administrative data processing
5 office automation

Batch 15: E,D

0 handicapped aids
1 computer applications
2 administrative data processing
3 financial data processing
4 spreadsheet programs
5 office automation

Batch 8: A

0 handicapped aids
1 computer applications
2 administrative data processing
3 teleconferencing
4 telephony
5 office automation

Batch 2: A

0 handicapped aids
1 computer applications
2 software packages
3 integrated software
4 administrative data processing
5 office automation

User 6-Search terms: neural water pollution

Batch 28: C

0 neural nets
1 biocybernetics
2 ecology
3 pollution
4 water pollution
5 water treatment
6 water pollution detection and control

Batch 25: C

0 neural nets
1 biocybernetics
2 ecology
3 natural resources
4 water supply
5 water pollution
6 water pollution detection and control

Batch 24: C

0 neural nets
1 biocybernetics
2 ecology
3 natural resources
4 water pollution
5 water treatment
6 water pollution detection and control

Batch 57: C

0 neural nets
1 artificial intelligence
2 biocybernetics
3 ecology
4 pollution
5 water pollution
6 water pollution detection and control

Batch 18: C

0 neural nets
1 biocybernetics
2 ecology
3 aquaculture
4 water treatment
5 water pollution
6 water pollution detection and control

Batch 63: C

0 neural nets
1 learning systems
2 biocybernetics
3 ecology
4 pollution
5 water pollution
6 water pollution detection and control

Batch 12: A

0 neural nets
1 biocybernetics
2 biology
3 aquaculture
4 water treatment
5 water pollution
6 water pollution detection and control

Batch 10: C

0 neural nets
1 biocybernetics
2 biology
3 ecology
4 pollution
5 water pollution
6 water pollution detection and control

Batch 27: C

0 neural nets
1 biocybernetics
2 ecology
3 pollution
4 radioactive pollution
5 water pollution
6 water pollution detection and control

Batch 33: C

0 neural nets
1 biocybernetics
2 living systems
3 ecology
4 pollution
5 water pollution
6 water pollution detection and control

User 7-Search terms: optical fiber position

Batch 0: C

0 position measurement
1 servomechanisms
2 fuzzy control
3 neural nets
4 optical neural nets
5 optical interconnections
6 optical fibres

Batch 6: C

0 position measurement
1 spatial variables measurement
2 measurement
3 optical variables measurement
4 optical testing
5 optical fibre testing
6 optical fibres

Batch 2: C

0 position measurement
1 spatial variables measurement
2 measurement
3 testing
4 optical testing
5 optical fibre testing
6 optical fibres

Batch 7: C

0 position measurement
1 spatial variables measurement
2 measurement
3 optical variables measurement
4 optical time-domain reflectometry
5 optical fibre testing
6 optical fibres

Batch 5: C

0 position measurement
1 spatial variables measurement
2 measurement
3 optical variables measurement
4 optical loss measurement
5 optical fibre testing
6 optical fibres

Batch 8: C

0 position measurement
1 spatial variables measurement
2 measurement
3 optical variables measurement
4 optics
5 gradient index optics
6 optical fibres

Batch 9: C

0 position measurement
1 spatial variables measurement
2 measurement
3 optical variables measurement
4 optics
5 optical elements
6 optical fibres

Batch 1: B

0 position measurement
1 spatial variables measurement
2 angular measurement
3 stroboscopes
4 synchronisation
5 SONET
6 optical fibres

Batch 3: B

0 position measurement
1 spatial variables measurement
2 measurement
3 time measurement
4 synchronisation
5 SONET
6 optical fibres

Batch 4: C

0 position measurement
1 spatial variables measurement
2 measurement
3 loss measurement
4 optical loss measurement
5 optical fibre testing
6 optical fibres

User 8-Search terms: expert systems object oriented development

Batch 11: A

0 object-oriented programming
1 object-oriented methods
2 object-oriented databases
3 database management systems
4 decision support systems
5 expert systems

Batch 10: F

0 object-oriented programming
1 object-oriented databases
2 database management systems
3 multimedia systems
4 computer applications
5 expert systems

Batch 12: D

0 object-oriented programming
1 object-oriented methods
2 object-oriented databases
3 database management systems
4 group decision support systems
5 expert systems

Batch 9: D

0 object-oriented programming
1 object-oriented databases
2 database management systems
3 information systems
4 computer applications
5 expert systems

Batch 7: D

0 object-oriented programming
1 object-oriented databases
2 database management systems
3 deductive databases
4 knowledge based systems
5 expert systems

Batch 4: D

0 object-oriented programming
1 software engineering
2 configuration management
3 CAD
4 intelligent design assistants
5 expert systems

Batch 6: D

0 object-oriented programming
1 object-oriented databases
2 database management systems
3 decision support systems
4 group decision support systems
5 expert systems

Batch 22: D

0 object-oriented programming
1 programming
2 logic programming
3 knowledge representation
4 knowledge based systems
5 expert systems

Batch 8: D

0 object-oriented programming
1 object-oriented databases
2 database management systems
3 group decision support systems
4 decision support systems
5 expert systems

Batch 3: D

0 object-oriented programming
1 software engineering
2 configuration management
3 CAD
4 computer applications
5 expert systems

Appendix M

Users Relevance Judgements: Experiment 2

The numbers in columns "Batch1" to "Batch5" represent the position of the document in the corresponding "Doc. No" column among the documents retrieved by that batch. 0 represents rank 1. When there is no number, it indicates that the corresponding document is not among the first 500 documents retrieved by that batch. For example, B5_0 indicates that document with the id no. 4179164 is ranked at position 1 by Batch 5, B4_0 represents that the same document is ranked also at position 1 by Batch 4, and B1_174 indicates that the same document is ranked at position 175 by Batch 1

User 1-Search terms: object database benchmarks

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3532501	B1_19	B2_2	B3_2	B4_3	B5_1
3775454	B1_23	B2_10	B3_28	B4_30	B5_15
3966581	B1_8	B2_7	B3_7	B4_12	B5_4
3983605	B1_14	B2_9	B3_10	B4_14	B5_6
4041455	B1_	B2_214	B3_229	B4_9	B5_
4179164	B1_174	B2_0	B3_0	B4_0	B5_0
4304416	B1_10	B2_3	B3_3	B4_4	B5_5
4471702	B1_17	B2_93	B3_97	B4_109	B5_13
4471704	B1_15	B2_1	B3_1	B4_1	B5_10

User 2-Search terms: computer vision detection

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3493092	B1_	B2_	B3_	B4_	B5_16
3505670	B1_	B2_	B3_492	B4_	B5_6
3576797	B1_	B2_	B3_	B4_	B5_5
3776580	B1_	B2_	B3_496	B4_	B5_12
4076501	B1_	B2_	B3_495	B4_	B5_11
4281793	B1_	B2_	B3_	B4_	B5_19
4286518	B1_	B2_	B3_489	B4_	B5_2
4317704	B1_96	B2_94	B3_74	B4_84	B5_460
4318829	B1_13	B2_11	B3_10	B4_11	B5_381
4320315	B1_18	B2_17	B3_17	B4_16	B5_
4335806	B1_119	B2_112	B3_90	B4_102	B5_8
4349329	B1_	B2_	B3_488	B4_	B5_1
4351961	B1_9	B2_7	B3_6	B4_7	B5_77
4354452	B1_82	B2_81	B3_61	B4_72	B5_205
4361463	B1_12	B2_10	B3_9	B4_10	B5_
4361465	B1_5	B2_3	B3_2	B4_3	B5_
4368205	B1_14	B2_12	B3_11	B4_12	B5_
4377436	B1_81	B2_79	B3_59	B4_71	B5_203
4394266	B1_72	B2_69	B3_50	B4_63	B5_17
4401807	B1_15	B2_13	B3_12	B4_13	B5_
4403833	B1_0	B2_5	B3_4	B4_5	B5_
4417872	B1_8	B2_6	B3_5	B4_6	B5_72
4436106	B1_95	B2_93	B3_73	B4_83	B5_312
4478650	B1_11	B2_9	B3_8	B4_9	B5_158
4483111	B1_20	B2_19	B3_19	B4_18	B5_91

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3505459	B1_	B2_	B3_497	B4_	B5_13
3731231	B1_	B2_	B3_491	B4_	B5_4
4154686	B1_	B2_	B3_493	B4_	B5_7
4178879	B1_	B2_	B3_487	B4_	B5_0
4286546	B1_143	B2_135	B3_	B4_123	B5_18
4288325	B1_1	B2_22	B3_22	B4_21	B5_
4292755	B1_93	B2_91	B3_71	B4_81	B5_415
4295899	B1_17	B2_16	B3_16	B4_15	B5_379
4311255	B1_147	B2_14	B3_14	B4_127	B5_380
4333759	B1_4	B2_2	B3_1	B4_2	B5_
4361464	B1_7	B2_4	B3_3	B4_4	B5_
4366020	B1_16	B2_15	B3_15	B4_14	B5_
4478649	B1_10	B2_8	B3_7	B4_8	B5_114
4489275	B1_3	B2_1	B3_13	B4_1	B5_

User 3-Search terms: hypertext and internet

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3601152	B1_	B2_5	B3_	B4_	B5_
3844314	B1_	B2_	B3_15	B4_	B5_
3844322	B1_	B2_	B3_14	B4_	B5_
3844329	B1_	B2_	B3_17	B4_	B5_
4011731	B1_40	B2_12	B3_27	B4_40	B5_
4092175	B1_10	B2_	B3_	B4_8	B5_
4128151	B1_489	B2_445	B3_12	B4_462	B5_
4147564	B1_261	B2_2	B3_241	B4_235	B5_
4228202	B1_356	B2_307	B3_3	B4_19	B5_
4229615	B1_355	B2_306	B3_338	B4_18	B5_
4244161	B1_6	B2_177	B3_208	B4_1	B5_
4274027	B1_36	B2_8	B3_23	B4_37	B5_
4281790	B1_14	B2_210	B3_242	B4_16	B5_
4297403	B1_288	B2_238	B3_270	B4_17	B5_
4386399	B1_44	B2_15	B3_30	B4_42	B5_
4454051	B1_	B2_	B3_	B4_	B5_3
4468676	B1_	B2_	B3_	B4_	B5_8
4491392	B1_	B2_	B3_	B4_	B5_11

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3529576	B1_42	B2_14	B3_29	B4_41	B5_
3786605	B1_32	B2_	B3_	B4_13	B5_406
3821487	B1_	B2_	B3_5	B4_	B5_
3955003	B1_31	B2_	B3_	B4_12	B5_342
4134547	B1_48	B2_19	B3_34	B4_46	B5_
4135342	B1_69	B2_40	B3_1	B4_67	B5_
4137495	B1_30	B2_	B3_	B4_11	B5_315
4165241	B1_46	B2_17	B3_32	B4_44	B5_
4182595	B1_0	B2_0	B3_0	B4_0	B5_1
4182597	B1_35	B2_7	B3_22	B4_36	B5_
4184545	B1_47	B2_18	B3_33	B4_45	B5_
4189239	B1_2	B2_11	B3_26	B4_2	B5_
4189241	B1_9	B2_494	B3_	B4_7	B5_
4190992	B1_3	B2_9	B3_24	B4_38	B5_
4254513	B1_	B2_4	B3_	B4_	B5_
4292357	B1_13	B2_199	B3_230	B4_224	B5_
4310878	B1_488	B2_3	B3_472	B4_461	B5_
4322991	B1_1	B2_	B3_	B4_9	B5_142
4356874	B1_4	B2_1	B3_7	B4_4	B5_0
4370831	B1_	B2_	B3_126	B4_	B5_12
4375802	B1_11	B2_124	B3_156	B4_151	B5_
4410775	B1_45	B2_16	B3_31	B4_43	B5_
4451539	B1_	B2_	B3_	B4_	B5_10
4453056	B1_	B2_	B3_	B4_	B5_15
4457823	B1_226	B2_173	B3_8	B4_200	B5_
4478875	B1_	B2_	B3_	B4_	B5_7
4479109	B1_	B2_	B3_	B4_	B5_5

User 4-Search terms: UV spectroscopy database

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3662688	B1_54	B2_50	B3_50	B4_8	B5_313
3770879	B1_0	B2_7	B3_45	B4_157	B5_293
4002410	B1_19	B2_96	B3_421	B4_	B5_
4089976	B1_198	B2_186	B3_7	B4_34	B5_290
4099425	B1_74	B2_60	B3_58	B4_26	B5_9
4113582	B1_36	B2_33	B3_31	B4_15	B5_289
4262234	B1_6	B2_38	B3_36	B4_21	B5_451
4272979	B1_5	B2_37	B3_35	B4_20	B5_424
4322934	B1_32	B2_28	B3_25	B4_11	B5_328
4369003	B1_16	B2_12	B3_61	B4_397	B5_15
4420738	B1_34	B2_31	B3_29	B4_14	B5_177
4430803	B1_10	B2_5	B3_3	B4_29	B5_13
4451714	B1_22	B2_18	B3_64	B4_31	B5_16
4469226	B1_12	B2_6	B3_5	B4_2	B5_21

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3454601	B1_	B2_	B3_474	B4_317	B5_8
3507795	B1_92	B2_67	B3_63	B4_403	B5_18
3547256	B1_17	B2_14	B3_12	B4_53	B5_173
3701811	B1_31	B2_27	B3_24	B4_10	B5_257
3705515	B1_13	B2_8	B3_47	B4_183	B5_409
3802562	B1_141	B2_129	B3_4	B4_0	B5_297
3818255	B1_20	B2_16	B3_14	B4_59	B5_221
3864661	B1_37	B2_34	B3_32	B4_17	B5_1
3864662	B1_76	B2_61	B3_60	B4_28	B5_11
3864663	B1_8	B2_2	B3_27	B4_78	B5_
3896024	B1_53	B2_49	B3_49	B4_191	B5_5
3900546	B1_75	B2_13	B3_59	B4_27	B5_10
4010553	B1_23	B2_19	B3_16	B4_65	B5_344
4116483	B1_	B2_	B3_	B4_402	B5_17
4157940	B1_7	B2_41	B3_38	B4_23	B5_2
4169094	B1_4	B2_29	B3_26	B4_12	B5_251
4257098	B1_11	B2_11	B3_54	B4_24	B5_3
4258918	B1_38	B2_35	B3_33	B4_18	B5_419
4262231	B1_14	B2_64	B3_62	B4_30	B5_14
4288206	B1_62	B2_54	B3_55	B4_262	B5_7
4345260	B1_30	B2_4	B3_23	B4_9	B5_0
4356399	B1_39	B2_36	B3_34	B4_19	B5_484
4356401	B1_33	B2_30	B3_28	B4_13	B5_321
4394245	B1_9	B2_3	B3_2	B4_25	B5_6
4435230	B1_294	B2_283	B3_11	B4_6	B5_323
4466952	B1_2	B2_1	B3_6	B4_4	B5_30
4489228	B1_328	B2_317	B3_272	B4_172	B5_4

User 5-Search terms: impact information technology disabled

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3459220	B1_417	B2_8	B3_	B4_	B5_
3888187	B1_28	B2_31	B3_38	B4_41	B5_19
3898676	B1_430	B2_9	B3_	B4_	B5_
4460770	B1_472	B2_432	B3_385	B4_411	B5_17

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3450931	B1_	B2_	B3_0	B4_397	B5_
3492361	B1_10	B2_13	B3_17	B4_18	B5_
3495096	B1_202	B2_220	B3_11	B4_12	B5_
3495097	B1_304	B2_278	B3_13	B4_14	B5_
3496400	B1_23	B2_27	B3_34	B4_36	B5_14
3552626	B1_298	B2_272	B3_12	B4_13	B5_
3623887	B1_21	B2_25	B3_31	B4_33	B5_12
3652241	B1_3	B2_254	B3_302	B4_323	B5_
3664088	B1_25	B2_29	B3_36	B4_38	B5_18
3700017	B1_180	B2_198	B3_8	B4_9	B5_471
3706275	B1_11	B2_14	B3_18	B4_19	B5_1
3706276	B1_17	B2_21	B3_26	B4_27	B5_8
3706277	B1_16	B2_20	B3_25	B4_26	B5_7
3706278	B1_24	B2_28	B3_35	B4_37	B5_16
3706279	B1_26	B2_30	B3_37	B4_40	B5_15
3706280	B1_19	B2_23	B3_29	B4_30	B5_11
3706281	B1_14	B2_18	B3_21	B4_22	B5_5
3731270	B1_13	B2_17	B3_20	B4_21	B5_3
3731279	B1_15	B2_19	B3_23	B4_24	B5_4
3731292	B1_20	B2_24	B3_30	B4_32	B5_10
3821703	B1_0	B2_150	B3_138	B4_157	B5_409
3923958	B1_119	B2_133	B3_4	B4_5	B5_377
3936644	B1_168	B2_186	B3_9	B4_10	B5_452
3980341	B1_150	B2_168	B3_5	B4_6	B5_435
3982687	B1_18	B2_22	B3_27	B4_28	B5_6
4085155	B1_7	B2_12	B3_15	B4_16	B5_0
4119267	B1_22	B2_26	B3_32	B4_34	B5_13
4255625	B1_12	B2_16	B3_19	B4_20	B5_2
4292364	B1_5	B2_4	B3_6	B4_7	B5_346
4292365	B1_188	B2_206	B3_10	B4_11	B5_483
4382704	B1_105	B2_111	B3_3	B4_4	B5_373
4407753	B1_1	B2_0	B3_7	B4_8	B5_451
4408182	B1_2	B2_1	B3_1	B4_1	B5_347
4442797	B1_326	B2_315	B3_16	B4_17	B5_

User 6-Search terms: neural water pollution

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3472499	B1_3	B2_3	B3_3	B4_3	B5_57
3558235	B1_128	B2_19	B3_129	B4_124	B5_150
3684425	B1_108	B2_17	B3_109	B4_104	B5_111
3703160	B1_38	B2_7	B3_39	B4_27	B5_47
3859073	B1_14	B2_20	B3_14	B4_88	B5_127
3921980	B1_8	B2_9	B3_8	B4_8	B5_108
3967078	B1_6	B2_6	B3_6	B4_6	B5_89
3977177	B1_19	B2_27	B3_19	B4_146	B5_190
4003872	B1_12	B2_16	B3_12	B4_56	B5_45
4003873	B1_31	B2_40	B3_32	B4_20	B5_17
4003875	B1_1	B2_1	B3_1	B4_1	B5_28
4014960	B1_16	B2_24	B3_16	B4_102	B5_147
4061069	B1_34	B2_45	B3_35	B4_22	B5_12
4245349	B1_5	B2_5	B3_5	B4_5	B5_78
4315865	B1_37	B2_48	B3_38	B4_26	B5_16
4391421	B1_28	B2_36	B3_29	B4_17	B5_10
4096761	B1_199	B2_205	B3_201	B4_200	B5_4

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3508805	B1_17	B2_25	B3_17	B4_126	B5_178
3529128	B1_75	B2_12	B3_76	B4_67	B5_56
3529129	B1_40	B2_50	B3_41	B4_29	B5_18
3558237	B1_67	B2_11	B3_68	B4_59	B5_49
3749019	B1_232	B2_254	B3_235	B4_14	B5_
3775398	B1_21	B2_29	B3_21	B4_10	B5_1
3780811	B1_27	B2_35	B3_28	B4_16	B5_8
3967911	B1_22	B2_30	B3_22	B4_11	B5_2
4003871	B1_11	B2_15	B3_11	B4_46	B5_71
4057946	B1_4	B2_4	B3_4	B4_4	B5_54
4180061	B1_0	B2_0	B3_0	B4_0	B5_9
4230681	B1_13	B2_18	B3_13	B4_74	B5_55
4278891	B1_36	B2_47	B3_37	B4_25	B5_15
4285093	B1_24	B2_32	B3_24	B4_12	B5_3
4403685	B1_41	B2_51	B3_42	B4_30	B5_19
4367768	B1_26	B2_34	B3_27	B4_15	B5_6
4101149	B1_73	B2_10	B3_74	B4_65	B5_81
4455805	B1_324	B2_403	B3_332	B4_286	B5_7
4488261	B1_20	B2_28	B3_20	B4_9	B5_0

User 7-Search terms: optical fiber position

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3507680	B1_335	B2_290	B3_275	B4_266	B5_
3546841	B1_13	B2_308	B3_293	B4_286	B5_
3581368	B1_12	B2_268	B3_253	B4_244	B5_
3586193	B1_15	B2_354	B3_339	B4_334	B5_
3593109	B1_377	B2_331	B3_316	B4_309	B5_
3661837	B1_24	B2_34	B3_20	B4_18	B5_29
3678390	B1_68	B2_	B3_	B4_	B5_
3910323	B1_22	B2_32	B3_18	B4_16	B5_22
4103338	B1_6	B2_117	B3_101	B4_92	B5_389

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
4031523	B1_179	B2_131	B3_115	B4_106	B5_433

User 8-Search terms: expert systems object oriented development

PATIALLY RELEVANT DOCUMENTS (P)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3513209	B1_100	B2_80	B3_94	B4_62	B5_13
3513515	B1_94	B2_74	B3_89	B4_57	B5_6
3570772	B1_37	B2_19	B3_45	B4_28	B5_471
3649060	B1_28	B2_449	B3_491	B4_19	B5_470
3667930	B1_39	B2_21	B3_48	B4_30	B5_498
3679809	B1_22	B2_12	B3_39	B4_14	B5_185
3775723	B1_79	B2_58	B3_76	B4_48	B5_56
3798374	B1_17	B2_11	B3_32	B4_10	B5_147
3842247	B1_52	B2_32	B3_0	B4_35	B5_20
3938798	B1_98	B2_78	B3_92	B4_60	B5_9
3941107	B1_105	B2_85	B3_97	B4_65	B5_10
3945439	B1_27	B2_412	B3_450	B4_18	B5_363
3966685	B1_245	B2_223	B3_15	B4_187	B5_434
3986395	B1_335	B2_309	B3_348	B4_241	B5_491
3986416	B1_207	B2_185	B3_8	B4_149	B5_291
4043206	B1_166	B2_145	B3_4	B4_110	B5_209
4055491	B1_129	B2_109	B3_3	B4_79	B5_43
4055494	B1_114	B2_94	B3_103	B4_71	B5_16
4067157	B1_4	B2_45	B3_68	B4_0	B5_86
4117448	B1_89	B2_69	B3_85	B4_54	B5_5
4119125	B1_16	B2_10	B3_27	B4_9	B5_315
4120921	B1_104	B2_84	B3_96	B4_64	B5_17
4144247	B1_82	B2_61	B3_79	B4_49	B5_51
4147469	B1_25	B2_406	B3_444	B4_16	B5_345
4155623	B1_493	B2_461	B3_	B4_392	B5_449
4185206	B1_15	B2_257	B3_284	B4_8	B5_
4199399	B1_19	B2_340	B3_380	B4_12	B5_248
4223619	B1_199	B2_177	B3_7	B4_140	B5_279
4244023	B1_233	B2_211	B3_13	B4_175	B5_379
4248989	B1_154	B2_133	B3_129	B4_98	B5_152
4249413	B1_238	B2_216	B3_18	B4_180	B5_391
4262634	B1_	B2_	B3_	B4_	B5_15
4286239	B1_26	B2_409	B3_447	B4_17	B5_358
4303896	B1_280	B2_254	B3_282	B4_213	B5_164
4315489	B1_24	B2_13	B3_	B4_	B5_7
4331045	B1_9	B2_5	B3_	B4_421	B5_
4445809	B1_30	B2_16	B3_	B4_	B5_36
4453718	B1_10	B2_189	B3_9	B4_3	B5_309
4462080	B1_3	B2_1	B3_172	B4_143	B5_
4470059	B1_2	B2_15	B3_	B4_50	B5_31

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3471373	B1_364	B2_336	B3_376	B4_267	B5_
3479245	B1_196	B2_174	B3_167	B4_137	B5_94
3532929	B1_85	B2_64	B3_82	B4_52	B5_1
3551456	B1_95	B2_75	B3_90	B4_58	B5_8
3592660	B1_228	B2_207	B3_204	B4_170	B5_214
3639216	B1_29	B2_14	B3_40	B4_20	B5_261
3664178	B1_21	B2_365	B3_403	B4_13	B5_299
3684804	B1_34	B2_18	B3_42	B4_24	B5_326

User 8-Search terms: expert systems object oriented development
(continued from previous page)

RELEVANT DOCUMENTS (R)

Doc. No	Batch1	Batch2	Batch3	Batch4	Batch5
3685474	B1_18	B2_296	B3_328	B4_11	B5_188
3706303	B1_106	B2_86	B3_98	B4_66	B5_18
3728190	B1_84	B2_63	B3_81	B4_51	B5_0
3746332	B1_107	B2_87	B3_99	B4_67	B5_19
3775788	B1_86	B2_65	B3_83	B4_53	B5_2
3799868	B1_33	B2_17	B3_41	B4_23	B5_289
3860058	B1_223	B2_202	B3_10	B4_165	B5_355
3883983	B1_225	B2_204	B3_11	B4_167	B5_361
3907162	B1_263	B2_240	B3_19	B4_202	B5_474
3908212	B1_99	B2_79	B3_93	B4_61	B5_11
3944890	B1_296	B2_269	B3_292	B4_216	B5_322
3986390	B1_	B2_481	B3_	B4_417	B5_469
3986914	B1_53	B2_33	B3_1	B4_36	B5_141
4055484	B1_178	B2_157	B3_5	B4_120	B5_99
4086388	B1_12	B2_8	B3_24	B4_5	B5_323
4106637	B1_23	B2_388	B3_425	B4_15	B5_348
4155669	B1_189	B2_168	B3_6	B4_130	B5_250
4261730	B1_14	B2_265	B3_285	B4_7	B5_
4286020	B1_13	B2_9	B3_25	B4_6	B5_227
4297125	B1_8	B2_4	B3_412	B4_301	B5_257
4331404	B1_1	B2_0	B3_56	B4_38	B5_14
4345684	B1_11	B2_7	B3_22	B4_4	B5_241
4348248	B1_0	B2_6	B3_	B4_25	B5_
4379152	B1_5	B2_66	B3_	B4_282	B5_
4382835	B1_6	B2_2	B3_12	B4_1	B5_47

Appendix N

Users Relevance Judgements - Precision Values: Experiment 1

B1	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	2	0	3	5	0	5	9	0	6	13	0	7
2	3	1	1	6	3	1	6	5	4	10	6	4
3	1	2	2	1	3	6	2	5	8	5	6	9
4	5	0	0	5	2	3	6	3	6	6	4	10
5	5	0	0	6	2	2	9	2	4	11	3	6
6	1	0	4	1	1	8	1	1	13	3	1	16
7	1	0	4	1	0	9	1	0	14	2	0	18
8	0	2	3	1	4	5	2	6	7	2	6	12
Total	18	5	17	26	15	39	36	22	62	52	26	82

B2	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	3	0	2	7	0	3	12	0	3	17	0	3
2	2	1	2	3	3	4	4	6	5	5	9	6
3	1	1	3	3	3	4	5	6	4	7	6	7
4	0	0	5	2	0	8	3	0	12	4	1	15
5	3	0	2	6	2	2	9	2	4	11	3	6
6	1	0	4	1	0	9	1	1	13	1	2	17
7	1	0	4	1	0	9	1	0	14	2	1	17
8	1	2	2	1	2	7	2	3	10	2	5	13
Total	12	4	24	24	10	46	37	18	65	49	27	84

B3	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	4	0	1	9	0	1	14	0	1	15	0	5
2	1	4	0	4	4	2	5	6	4	6	9	5
3	2	1	2	6	2	2	8	4	3	9	4	7
4	0	2	3	1	4	5	2	4	9	3	6	11
5	4	0	1	6	2	2	9	2	4	11	3	6
6	1	0	4	1	0	9	1	0	14	2	0	18
7	0	0	5	1	0	9	1	0	14	1	0	19
8	0	2	3	1	4	5	2	6	7	2	6	12
Total	12	9	19	29	16	35	42	22	56	49	28	83

B4	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	3	0	2	8	2	0	13	0	2	14	0	6
2	1	4	0	2	8	0	5	9	1	8	9	3
3	2	1	2	3	3	4	6	5	4	7	5	8
4	2	1	2	4	2	4	5	2	8	8	2	10
5	2	0	3	5	1	4	9	1	5	10	2	8
6	1	0	4	1	0	9	1	1	13	1	2	17
7	0	0	5	1	0	9	1	0	14	1	0	19
8	0	0	5	0	0	10	0	1	14	0	1	19
Total	11	6	23	24	16	40	40	19	61	49	21	90

B5	@5			@10			@15			@20		
User	**R**	**P**	**N**	**R**	**P**	**N**	**R**	**P**	**N**	**R**	**P**	**N**
1	1	0	4	1	0	9	3	0	12	4	0	16
2	1	2	2	4	3	3	6	6	3	8	9	3
3	1	1	3	2	3	5	2	4	9	4	5	11
4	0	2	3	1	3	6	3	5	7	3	6	11
5	2	0	3	6	0	4	6	4	5	9	5	6
6	1	0	4	1	0	9	1	0	14	1	1	18
7	0	0	5	1	0	9	1	0	14	1	0	19
8	0	1	4	0	3	7	0	3	12	1	4	15
Total	6	6	28	16	12	52	22	22	76	31	30	99

Appendix O

Users Relevance Judgements - Precision Values: Experiment 2

B1	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	0	0	5	1	0	9	3	0	12	6	0	14
2	3	1	1	4	4	2	5	8	2	7	10	3
3	5	0	0	8	1	1	8	3	4	8	3	9
4	2	1	2	5	3	2	8	5	2	9	7	4
5	4	0	1	6	0	4	11	0	4	16	0	4
6	2	2	1	2	5	3	4	7	4	5	9	6
7	0	0	5	0	1	9	0	3	12	0	4	16
8	2	3	0	5	4	1	9	5	1	10	9	1
Total	18	7	15	31	18	31	48	31	41	61	42	57

B2	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	4	0	1	6	0	4	7	0	8	7	0	13
2	3	1	1	4	5	1	5	9	1	7	11	2
3	4	1	0	6	3	1	8	4	3	12	5	3
4	4	0	1	5	3	2	8	4	3	10	5	5
5	3	0	2	3	2	5	6	2	7	10	2	8
6	2	2	1	2	6	2	5	6	4	7	9	4
7	0	0	5	0	0	10	0	0	15	0	0	20
8	3	1	1	7	2	1	8	6	1	10	9	1
Total	23	5	12	33	21	26	47	31	42	63	41	56

B3	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	4	0	1	5	0	5	6	0	9	6	0	14
2	2	2	1	3	6	1	5	9	1	7	11	2
3	2	1	2	5	1	4	5	3	7	5	5	10
4	2	1	2	3	3	4	6	4	6	7	3	10
5	4	0	1	9	0	1	14	0	1	18	0	2
6	2	2	1	2	5	3	4	7	4	5	9	6
7	0	0	5	0	0	10	0	0	15	0	1	19
8	1	3	1	3	6	1	6	7	2	7	9	4
Total	17	9	14	30	21	29	46	29	45	55	38	67

B4	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	4	0	1	5	0	5	7	0	8	7	0	13
2	3	1	1	4	5	1	5	9	1	6	11	3
3	3	1	1	5	2	3	8	2	5	8	6	6
4	2	1	2	4	2	4	7	4	4	10	5	5
5	2	0	3	7	0	3	12	0	3	16	0	4
6	2	2	1	3	5	2	7	5	3	9	6	5
7	0	0	5	0	0	10	0	0	15	0	2	18
8	2	2	1	5	4	1	7	7	1	8	11	1
Total	18	7	15	33	18	29	53	27	40	64	41	55

B5	@5			@10			@15			@20		
User	R	P	N	R	P	N	R	P	N	R	P	N
1	3	0	2	5	0	5	7	0	8	8	0	12
2	2	2	1	3	5	2	4	7	4	5	10	5
3	2	1	2	4	2	4	6	3	6	7	3	10
4	5	0	0	9	1	0	12	2	1	14	4	2
5	5	0	0	9	0	1	14	0	1	17	2	1
6	4	1	0	7	1	2	7	3	5	9	5	6
7	0	0	5	0	0	10	0	0	15	0	0	20
8	3	0	2	4	4	2	6	6	3	8	9	3
Total	24	4	12	41	13	26	56	21	43	68	33	59

Appendix P

Comparison of Formulae: Experiment 1

USER 1:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
6	5	27	27	27
27	6	4	5	4
4	27	6	4	6
5	4	5	6	5

USER 2:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
7	16	16	26	10
16	26	10	16	16
10	10	7	10	7
26	7	26	7	26

USER 3:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
7	3	3	3	3
1	1	1	1	1
14	7	7	7	7
3	14	14	14	14

USER 4:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
10	1	1	14	14
1	14	14	10	1
4	4	10	1	10
14	10	4	4	4

USER 5:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
52, 49, 41	52	49	52	49
	49	41	49	52
	41	52	40	41
40	40	40	41	40

USER 6:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
4	4	4	51	4
51, 38	51	38	38	38
	44	51	4	51
44	38	44	44	44

USER 7:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
92	91	91	91	102
91	92	92	102	91
102, 95	102	102	92	92
	95	95	95	95

USER 8:

Rank (R+P)	F4	WPQ	Doszkocs	Simple
41, 43	41	20	43	12
	20	41	12	20, 41, 43
20	43	12	41	
12	12	43	20	

Appendix Q

Interaction in Okapi

This appendix describes the basic search interaction in network version of Okapi which uses a VT100 character based interface. The system is accessed over the university campus-wide network.

Centre for Interactive Systems Research
Dept of Information Science, City University, London

You need a VT100 emulation.

Choose a database, or type Q to quit

Databases:

1 City University library catalogue (1993)

2 Bath University enhanced library catalogue (1993)

3 Inspec extracts (1989-1993)

Q Quit

* * * * * * * * *
* O K A P I *
* * * * * * * * *

Experimental subject search system

Centre for Interactive Systems Research
City University, London
Feb 1992

Press the Return key to continue

CTRL-Y
to quit

INSPEC 10/89-09/93 SUBJECT SEARCH ** OKAPI

The computer will look for records which contain as many as possible of the words you type

Type words or a phrase describing the items you want :

Press CTRL-I for info

CTRL-Y to quit

INSPEC 10/89-09/93 SUBJECT SEARCH ** OKAPI

The computer will look for records which contain as many as possible of the words you type

Type words or a phrase describing the items you want :

| air traffic

Press CTRL-I for info

CTRL-Y to quit

The user enter search terms "air traffic".

SUBJECT SEARCH RESULTS
Search: "air traffic"

2673 items under "air"
4398 items under "traffic"

358 items match your search well

Type Display to look at the items found

Type New if you want to do a different search
Type Edit to change or add to your search

Press CTRL-I for info

CTRL-Y to quit

LIST OF PUBLICATIONS 1 to 9 of 358
Search: "air traffic"

No.	Title	Author	Year
1	Siemens' contribution to air traffic management.	Barnes, D H	1993
2	Demand management.	Bell, H A	1993
3	The evolution of European airspace towards precision..	Castelbou, C	1993
4	Direct volume display devices.	Clifton, T E	1993
5	An emergency situation simulator for examining time-..	Franklin, A L	1993
6	Employee trip reduction in Southern California: firs..	Giuliano, G	1993
7	Multiobjective decision making for traffic assignment.	Gwo Hshiung	1993
8	Designing with ethnography: making work visible.	Hughes, J A	1993
9	Force level analysis and mission effectiveness simul..	Humphreys-Jon	1993

Down (next)

Type its number to see if a publication is relevant

Type Options to see other things you can do

CTRL-Y to quit

The system displays the short description of the first 9 of 358 documents found.

Search: "air traffic"

AUTHOR(S): Barnes, D H
TITLE: Siemens' contribution to air traffic management.
SOURCE: Siemens Rev. (Germany), spec. issue., Spring 1993, 16-20

DESCRIPTORS: Air traffic computer control; safety.

HEADINGS: Air traffic management; aircraft movements; capacity; growth; safety; air traffic control infrastructure; Siemens.

Class: B7650C C3360L C7460

ABSTRACT: "Global air traffic is growing at about 6% per year, but the control system that handles aircraft movements is now stretched to full capacity. The key to accommodating growth while maintaining extremely high levels of safety is an overhaul of the air traffic control infrastructure.

Page 1 of 2 3 Down (next page)

or press Return to continue CTRL-Y to quit

User chooses the first record to see the details.

Search: "air traffic"

levels of safety is an overhaul of the air traffic control infrastructure. With the acquisition of Plessey Radar Limited in 1989 and the establishment of Siemens Plessey Systems' ATM Division in 1991, Siemens now has what it takes to help to solve the problem."

Docnum: 4450064

Page 2 of 2 3 Up (previous page)

Press CTRL-I for info

Is this the sort of thing you are looking for? (y/n)

CTRL-Y to quit

The rest of the first record is displayed. The system prompts for relevance judgement.

Search: "air traffic"

No.	Title	Author	Year
1**	Siemens' contribution to air traffic management.	Barnes, D H	1993
2**	Demand management.	Bell, H A	1993
3	The evolution of European airspace towards precision..	Castelbou, C	1993
4	Direct volume display devices.	Clifton, T E	1993
5	An emergency situation simulator for examining time-..	Franklin, A L	1993
6	Employee trip reduction in Southern California: firs..	Giuliano, G	1993
7	Multiobjective decision making for traffic assignment.	Gwo Hshiung	1993
8	Designing with ethnography: making work visible.	Hughes, J A	1993
9	Force level analysis and mission effectiveness simul..	Humphreys-Jon.	1993

Down (next)

Type its number to see if a publication is relevant

Type More to look for items similar to the ones you chose
Type Options to see other things you can do CTRL-Y to quit

** indicates the documents marked as relevant by the user by answering "Yes" to "Is this the sort of thing you are looking for? (y/n)" system prompt. The system offers the "More" option which initiates the Automatic Query Expansion (AQE) process.

Search: "air traffic"

No.	Title	Author	Year
1**	Siemens' contribution to air traffic management.	Barnes, D H	1993
2**	Demand management.	Bell, H A	1993
3	The evolution of Europea		
4	Direct volume display de		
5	An emergency situation s		
6	Employee trip reduction		
7	Multiobjective decision		
8	Designing with ethnograp		
9	Force level analysis and		

Down (next)

Type its number to see if a
Type More to look for items
Type Options to see other th

Looking for more publications similar to
the 2 you have chosen... please wait..

Found some more

Type Disp to see them
(the most similar ones should be near the top)

(or press Return if you don't want to see them)

CTRL-Y to quit

System initiates AQE by incorporating terms extracted from the two relevant documents.

(Original search: "air traffic")

No.	Title	Author	Year
1	From gridlock to guidance technology	von Tomkewits..	1993
2	The EC DRIVE programme-halfway through.	Bell, M	1990
3	Road transport informatics for demand management.	Ayland, N	1989
4	Future directions in traffic signal control.	Bell, M G H	1992
5	Scrap car pricing and welfare implications.	Chin Lim	1991
6	Scenarios and communications system architectures fo..	Catling, I	1991
7	Traffic models and road transport informatics	Stergiou, B	1989
8	Traffic guidance systems: from traffic broadcasts to..	Gleissner, E	1991
9	A model of air pollution from road traffic, based on..	Matzoros, A	1992

Down (next)

Type its number to see if a publication is relevant

Type Back to return to the publications you originally found
Type Options to see other things you can do CTRL-Y
to quit

The system displays the new documents found (similar to the two user chosen relevant documents) after the Automatic Query Expansion process.

(Original search: "air traffic")

AUTHOR(S): von Tomkewitsch, R
TITLE: From gridlock to **guidance** technology **(road traffic control)**.
SOURCE: **Siemens** Rev. (Germany), vol.60, no.3, May-June 1993, 12-15

DESCRIPTORS: Information systems; real-time systems; **road traffic**; traffic computer **control**.

HEADINGS: Digital **control**; **Siemens**; Europe; **road traffic control**; **traffic management**; EURO-SCOUT; information system; real-time information; development; intelligent vehicle highway system.

Class: C7420 C3360B

ABSTRACT: "Field trials have shown that dynamic individual &traffic **management** technology can significantly diminish **urban congestion**. Here,

Page 1 of 2 3 Down (next page)

or press Return to continue CTRL-Y

to quit

User examines the first record in the new list.

(Original search: "air traffic")

management technology can significantly diminish **urban congestion.** Here, the author describes how, with the aid of **Siemens'** EURO-SCOUT on-board information system, for instance, motorists can receive directions to a desired destination as well as real-time information regarding traffic situations, **parking** facilities, and **public** transit connections. The ultimate aim is the development of a pan-European intelligent vehicle highway system."

Docnum: 4450067

Page 2 of 2 3 Up (previous page)

Press CTRL-I
for info

Is this the sort of thing you are looking for? (y/n)

CTRL-Y
to quit

The rest of the document is displayed. The highlighted terms are the new search terms incorporated into the query by the system after AQE. These are extracted from the documents chosen as relevant by the user. The system, similar to previous iteration, initiates the relevance feedback mechanism by the prompt "Is this the sort of thing you are looking for? (y/n)".

Appendix R

Example Okapi Transaction Logs

Log text is in Roman, annotations in italic

I User special_no Database city.feb91 Date Wed Jun 19 13:12:32 1991
Program /usr/local/bin/s.city.3.1.3 Description Okapi rf
Version 3.1.3 Rev date 31 Jan 1991 Pid 12278

Identification

T 910619131232

Timestamp. The E *lines hereafter are elapsed times in seconds from the previous* E *or* T.

U s
C ** start
T 910619131239
S SCR7.1

SCR7.1 *is the search input screen.*

U strucu<LEFT>ture<LEFT>al vibta<LEFT><LEFT>ration<RET>
E +16
L structural (744), vibration (232),
E +0

User has typed a search with corrections, taking 16 seconds to type it. The system found 744 postings for "structural" and 232 for "vibration[s]".

O NMPW = 10 NGW = 10 NAW = 10

System has reported "10 books match your search well." User types d *for Display and looks at a screen of brief records for 27 seconds.*

U d
S BRIEFS

1	Sound and structural vibration : radiation, tran..	FAHY F J	1985
2	Structural vibration analysis : modelling, analy..	BEARDS C F	1983
3	Structural vibrations due to wind. Wind tunnel ..	(FLINT A R)	1980
4	Stresses, vibrations, structural integration and..	BEITCH L	1979
5	Formulas for natural frequency and mode shape.	BLEVINS R D	1979
6	Flow-induced vibration	BLEVINS R D	1977
7	Vibrations of engineering structures.	(BREBBIA C A)	1976
8	Free vibration analysis of beams and shafts.	GORMAN D J	1975
9	Flow-induced structural vibrations : proceedings..	(NAUDASCHER E)	1974

U 5
E +27
S FULL
AUTHOR(S): Blevins R D
TITLE(S): Formulas for natural frequency and mode shape.
PUBLICATION: Van Nostrand Reinhold, c1979.

SUBJECT(S): Structures. Vibration. Formulae. Structural dynamics. Vibration.

Shelved at : 624.171 BLE

U y
E +33

User has looked at the fifth record in full and answered "y" to the relevance question.

S BRIEFS
U 7
E +6
S FULL
AUTHOR(S): (Brebbia C A)
TITLE(S): Vibrations of engineering structures.
PUBLICATION: Computational Mechanics Ltd, 1976.

SUBJECT(S): Structures. Vibration. Structural dynamics. Vibration.

Shelved at : 624.171 BRE

U y
E +7
S BRIEFS
U d
E +12
S BRIEFS

1	Structure-borne sound; structural vibrations and..	CREMER L	1973
	** END OF LIST **		

U o
E +9
S OPTIONS
U v
E +12
S VIEWING
S BRIEFS

1**	Formulas for natural frequency and mode shape.	BLEVINS R D	1979
2**	Vibrations of engineering structures.	(BREBBIA C A)	1976
	** END OF LIST **		

Reviewing chosen records

U o
E +4
S OPTIONS
U e
E +14

User chooses to edit the search, adding the term "aircraft".

S SCR7.2 (edit)
U structural vibration aircraft<RET>
E +22
L @0023 (430), structur (2433), vibration (232),
E +0
O NMPW = 0 NGW = 1 NAW = 50
U d
S BRIEFS

1	Introduction to the study of aircraft vibration ..	SCANLAN R H	1951
THE REST OF THE BOOKS MAY NOT MATCH YOUR SEARCH VERY WELL			
2	Mechanics of flow-induced sound and vibration.	BLAKE W K	1986
3	Mathematics of random phenomena : random vibrati..	KREE P	1986
4	Blast vibration monitoring and control.	DOWDING C H	1985
5	Sound and structural vibration : radiation, tran..	FAHY F J	1985
6	Dynamics and vibration of structures.	FERTIS D G	1984
7	Structural vibration analysis : modelling, analy..	BEARDS C F	1983
8	Vibrational spectra and structure : a series of ..	(MARTIN A E)	1980
9	Formulas for natural frequency and mode shape.	BLEVINS R D	1979

U 1
E +37
S FULL
AUTHOR(S): Scanlan R H; (Rosenbaum R)
TITLE(S): Introduction to the study of aircraft vibration and flutter.
PUBLICATION: Macmillan, 1951.

Shelved at : 629.132362 SCA

U y
E +7
S BRIEFS
U 6
E +6
S FULL
AUTHOR(S): Fertis D G
TITLE(S): Dynamics and vibration of structures.
PUBLICATION: Krieger, 1984.

Shelved at : 624.171 FER

U ^I
U y
E +9

User requests information, which at this point informs user that the system can look for more records similar to the ones which have been chosen.

S BRIEFS
U 7
E +7
S FULL
AUTHOR(S): Beards C F
TITLE(S): Structural vibration analysis : modelling, analysis and damping of vibrating structures.
Ellis Horwood series in engineering science.
PUBLICATION: Ellis Horwood, 1983.

SUBJECT(S): Structures. Vibration. Structural dynamics.

Shelved at : 624.171 BEA

U y
E +4
S BRIEFS
U m
E +1
S MORE
E +1
O NMPW = 0 NGW = 58 NAW = 58

User has chosen three records and now requests query expansion ("MORE"). System reports that some records have been found. It doesn't say how many unless there are less than a screenful.

U d
S BRIEFS

1	Formulas for natural frequency and mode shape.	BLEVINS R D	1979
2	Vibrations of engineering structures.	(BREBBIA C A)	1976
3	Flutter suppression and structural load alleviat..	(Agard. Structu..	
4	Stochastic methods in structural dynamics.	(SCHUELLER G I)	1987
5	Schaum's outline of theory and problems of dynam..	TUMA J J	1983
6	Analysis of structures by the force-displacement..	SMOLIRA M	1980
7	Sound and structural vibration : radiation, tran..	FAHY F J	1985
8	Flow-induced vibration	BLEVINS R D	1977
9	Several techniques for flight flutter testing : ..	(Agard. Structur.	1960

U 9
E +21
S FULL
AUTHOR(S): (Agard. Structures and Materials Panel); (Agard)
TITLE(S): Several techniques for flight flutter testing : papers presented at a special symposium during the eleventh meeting of the AGARD Structures and Materials Panel held in Athens, Greece... 1960.
Agard AG56.
PUBLICATION: Agard, 1960.

Shelved at : 629.132362 AGA

U y
E +23
S BRIEFS
U d
E +11
S BRIEFS

1	Stresses, vibrations, structural integration and..	BEITCH L	1979
2	Structural dynamics for the practising engineer.	IRVINE H M	1986
3	Dynamics of structures and machinery : problems ..	SZULADZINSKI G	1982
4	Advanced structural dynamics.	(DONEA J)	1980
5	Structural dynamics : theory and computation.	PAZ M	1980
6	The component element method in dynamics : with ..	LEVY S	1976
7	The dynamical behaviour of structures.	WARBURTON G B	1976
8	Dynamics of structures.	CLOUGH R W	1975
9	Dynamics in engineering structures.	KOLOUSEK V	1973

U 8
E +20
S FULL
AUTHOR(S): Clough R W; (Penzien J)
TITLE(S): Dynamics of structures.
PUBLICATION: McGraw-Hill, [1975].

SUBJECT(S): Structural dynamics

Shelved at : 624.171 CLO

U y
E +4
S BRIEFS
U o
E +5
S OPTIONS
U v
E +3
S VIEWING
S BRIEFS

1** Introduction to the study of aircraft vibration ..	SCANLAN R H	1951
2** Dynamics and vibration of structures.	FERTIS D G	1984
3** Structural vibration analysis : modelling, analy..	BEARDS C F	1983
4** Several techniques for flight flutter testing : ..	(Agard. Structu..	1960
5** Dynamics of structures.	CLOUGH R W	1975

** END OF LIST **

Now reviewing the three records originally chosen and the two chosen from query expansion.

U 4
E +10
S FULL
AUTHOR(S): (Agard. Structures and Materials Panel); (Agard)
TITLE(S): Several techniques for flight flutter testing : papers presented at a special symposium during the eleventh meeting of the AGARD Structures and Materials Panel held in Athens, Greece... 1960.
Agard AG56.
PUBLICATION: Agard, 1960.

Shelved at : 629.132362 AGA

U <RET>
E +11
S BRIEFS
U ^Y

Quit, finished.

E +3
C ** Record display summary - this search
Total unique briefs: 25
Fulls 5, chosen 5, rejected 0

Appendix S

Backtracking Script in Oracle SQL Used in the Spreading Activation Process -- Author: Mike Gatford

newquery.sql

```
(paddington)23% m newquery.sql
SET VERIFY OFF

ACCEPT new_query CHAR PROMPT 'new query? '

SET AUTOCOMMIT ON

ACCEPT no_of_generations CHAR PROMPT 'how many generations? '
ACCEPT maximum_terms CHAR PROMPT 'maximum number of terms to be found? '

@bestmatch

@lsearch

@transfer1

ACCEPT new_query CHAR PROMPT 'new query? '
ACCEPT no_of_generations CHAR PROMPT 'how many generations? '
ACCEPT maximum_terms CHAR PROMPT 'maximum number of terms to be found? '

@bestmatch

@lsearch

ACCEPT ngen1 CHAR PROMPT 'forward generations? '
ACCEPT ngen2 CHAR PROMPT 'reverse generations? '

@join
```

bestmatch.sql

```
DELETE FROM this;
DELETE FROM links;
DELETE FROM next;

INSERT INTO this(gen,succ)
SELECT 0, term_no
FROM term
WHERE text = '&new_query';

INSERT INTO links
SELECT * FROM this;
```

lsearch.sql

```
DECLARE
  loopcount NUMBER;
  linkcount NUMBER := 0;
BEGIN
  FOR loopcount IN 1..&no_of_generations LOOP
    INSERT INTO next
    SELECT loopcount, succ, term_no2
    FROM this, equivalence
    WHERE succ = term_no1
    UNION
    SELECT loopcount, succ, term_no1
    FROM THIS, equivalence
    WHERE succ = term_no2;

    INSERT INTO next
    SELECT loopcount, succ, term_no2
    FROM this, hierarchical
    WHERE succ = term_no1;

    INSERT INTO next
    SELECT loopcount, succ,
FROM this, hierarchical
    WHERE succ = term_no2;

    INSERT INTO next
    SELECT loopcount, succ, term_no2
    FROM this, associative
    WHERE succ = term_no1;

    INSERT INTO next
    SELECT loopcount, succ, term_no1
    FROM this, associative
    WHERE succ = term_no2;

    DELETE FROM next NX
    WHERE EXISTS (
      SELECT * FROM this
      WHERE NX.succ = this.pred
      AND NX.pred = this.succ
    );

    INSERT INTO links
    SELECT * from next;

    SELECT COUNT(*) INTO linkcount FROM links;

    IF (linkcount >= '&maximum_terms') or (linkcount = 0)
      THEN
        EXIT;
    END IF;

    DELETE FROM next NX
    WHERE EXISTS (
```

```
    SELECT * FROM next NY
    WHERE NX.succ = NY.succ
    AND NX.pred < NY.pred
   );

   DELETE FROM this;

   INSERT INTO this
   SELECT * FROM next NX;

   DELETE FROM next;

  END LOOP;

  DELETE FROM this;
  DELETE FROM next;
END;
```

transfer1.sql

```
DELETE FROM temp_links;

INSERT INTO temp_links
SELECT * FROM links;

DELETE FROM links;
```

join.sql

```
DECLARE
  g1 NUMBER;
  g2 NUMBER;
BEGIN
  g1 := &ngen1;
  g2 := &ngen2;
  WHILE g2 > 0 LOOP
    INSERT INTO temp_links
    SELECT (T.gen + 1), T.succ, L.pred
    FROM links L, temp_links T
    WHERE T.gen = g1
    AND L.gen = g2
    AND T.succ = L.succ
    AND T.pred <> L.pred;
    COMMIT;
    g1 := g1 + 1;
    g2 := g2 - 1;
  END LOOP;
END;
/
```

Appendix T

Script in Pro C for Initial Matching and Ranking the Thesaurus Terms -- Author: Mike Gatford

```
/*
**     Filename:  match.pc
**      Version:  1.4a
**    Directory:  ~sf395/cilks/forms/pro_c
** Version date:  23rd August 1993
**       Author:  Mike Gatford
**
** N.B. rename file to 'match.pc' before running 'Makefile'
**      rename object code, 'match' to whatever required,
**      e.g. cilks_match
**
** Pro*C program to perform initial matching of thesaurus terms to
** user's query expression.
**
** The program reads and writes Oracle tables in batches of 200
**
** The program may be run as:   match <search_key>
**                         or:   match
**
** If no <search_key> is given <search_key> defaults to 417
*/

#include <stdio.h>
#include <string.h>
#include <ctype.h>
#include <malloc.h>

#define MAX_TERMS 800
#define MAX_WORDS 10
#define MAX_WORD_LENGTH 40
#define MIN_WT 99
#define MAX_FREQ 50
#define FULL_LENGTH 132
#define MAX_ASS 100
#define MAX_FACETS 4

static int word_freq[MAX_WORDS];

EXEC SQL BEGIN DECLARE SECTION;
  VARCHAR   term_text[200][80], term_qualifier[200][50];
  int       facet_number[200], term_number[200], sqn[200], wgt[200];
  int       search_key, rows_to_fetch;
EXEC SQL END DECLARE SECTION;

EXEC SQL INCLUDE SQLCA;


struct sterm {
  int facet_no, seq_no, nwords, weight, term_no;
};

struct expression {
  int nwords, nrows;
  char facet[FULL_LENGTH], word[MAX_WORDS][MAX_WORD_LENGTH];
};
```

```
char strength = 's';            /* s = strong, w = weak */

int wstem_nospell(), sstem_nospell(), nostem_spell();
int wstem(), sstem(), nostem();

int (*func)();

/*
** dummy declarations to avoid 'undefined' compilation error
*/

int ftime, Secs;

/*
** end of dummy declarations
*/

FILE *ef;

main(argc, argv)

int argc;
char **argv;

{
  EXEC SQL BEGIN DECLARE SECTION;
    VARCHAR   username[20], password[10];
    VARCHAR   facet[4][120];
    int       fno[4], no_facets;
  EXEC SQL END DECLARE SECTION;

  int spell = 0, phrase = 1;
  int i, f, no_terms, word_count = 0, key = 462, row_count, no_rows;
  char strength = 's';

  struct expression *concept = NULL;

  system("rm sequence_nos.* first_match.lst match.err");

  if (argc < 2)
    key = 462;
  else
    key = atoi(argv[1]);

  ef = fopen("match.err", "w");

  /*
  ** The user's query expression and its key are stored in fields
  ** 'text' and 'key' in block 'facet' on form 'entry'.
  **
  ** These are assigned to the host variables 'query_exp' and
  ** 'search_key'  respectively.
  **
  ** The number of rows returned will be returned from the host variable
  ** 'row_count' to the form field ':search_term.num_rows'
```

```
*/

EXEC SQL WHENEVER SQLERROR GOTO main_error;

for (f = 0; f < MAX_FACETS; f++)
  facet[f].arr[0] = '\0';

/*
** Enter Oracle user id and password and connect to Oracle
*/

strcpy(username.arr, "cilks");
username.len = strlen(username.arr);
strcpy(password.arr, "darkstar");
password.len = strlen(password.arr);
EXEC SQL CONNECT :username IDENTIFIED BY :password;

/*
** Delete all rows from 'query_words'
*/
EXEC SQL DELETE FROM query_words;

set_function(strength, spell);

/*
** Set dummy search_key for 'search_term' table
*/

search_key = key;

EXEC SQL DELETE FROM search_term
  WHERE text IS NULL;

EXEC SQL SELECT facet_no, text
  INTO fno, facet
  FROM search_term
  WHERE key = :search_key
  AND facet_no > 0;

no_facets = sqlca.sqlerrd[2];

fprintf(ef, "No. facets = %d\n", no_facets);

concept =
                (struct expression *) malloc(sizeof(struct expression) * no_facets);

for (f = 0; f < no_facets; f++) {
  facet[f].arr[facet[f].len] = '\0';
  sprintf((concept + f)->facet, "%s", facet[f].arr);

  fprintf(ef, "Facet %d: [%s]\n", f, (concept + f)->facet);

  (concept + f)->nwords = 0;
  (concept + f)->nrows = 0;
```

```
  fprintf(ef, "-> make_lower ");
  make_lower((concept + f));

  fprintf(ef, "-> extract_words ");

  extract_words((concept + f));

  fprintf(ef, "-> stem_words\n");

  stem_words(key, &word_count, (concept + f), f);

  fprintf(ef, "\n\n");
}
fprintf(ef, "word_count = %d\n\n", word_count);

/*
** Function 'stem_words' returns the number of words in <expression>
** that actually exist in the thesaurus. If this is zero then there
** will be no matching thesaurus terms.
*/

if (word_count > 0) {
  row_count = 0;

  fprintf(ef, "-> find_matching_terms\n");

  find_matching_terms(concept);

  fprintf(ef, "-> allocate_sequence_nos ");

  allocate_sequence_nos(no_facets, concept);

  fprintf(ef, " ->sort_terms ");

  sort_terms(concept, no_facets, &row_count);

  fprintf(ef, "-> insert_rows\n");

  insert_rows(row_count);

  fprintf(ef, "\n");

  printf("A total of %d matching rows\n", row_count);
}
else
  printf("No matching terms\n\n");

fclose(ef);

exit(0);

main_error:
  printf("\n% .70s \n", sqlca.sqlerrm.sqlerrmc);
  EXEC SQL WHENEVER SQLERROR CONTINUE;
  EXEC SQL ROLLBACK WORK RELEASE;
```

```
    exit(1);
}


set_function(strength, spell)

/*
** This sets the stemming function to use. 'strength' is set to 's' in the
** main program, but the function is included in case it is need to change.
** The 'spelling' option is always used.
*/

int spell;
char strength;
{
  if (strength == 'w')
    func = wstem;
  else if (strength == 's')
    func = sstem;
}


make_lower(sentence)

/*
** Converts <expression> to lowercase
*/

struct expression *sentence;
{
  int i;

  for (i = 0; i < strlen(sentence->facet); i++)
    sentence->facet[i] = tolower(sentence->facet[i]);
}


extract_words(sentence)

/*
** Extract the words from expression
*/

struct expression *sentence;
{
  int i, nchars, start, end;
  char *pos, *dummy, *temp_word, tfacet[FULL_LENGTH];

  sprintf(tfacet, "%s", sentence->facet);
  sentence->nwords = 0;

  while ((pos = strchr(tfacet, ' ')) != NULL) {
    nchars = (int) (pos-tfacet);
    strncpy(sentence->word[sentence->nwords], tfacet, nchars);
    sentence->word[sentence->nwords][nchars] = '\0';
```

```
    (sentence->nwords)++;
    dummy = (char *) malloc(strlen(tfacet) - (int) (pos - tfacet));
    start = (int) (pos - tfacet) + 1;
    end = strlen(tfacet);

    for (i = start; i <= end; i++)
      dummy[i-start] = tfacet[i];

    tfacet[0] = '\0';
    sprintf(tfacet, "%s", dummy);
    free(dummy);
  }
  sprintf(sentence->word[sentence->nwords], "%s", tfacet);
  (sentence->nwords)++;
}


stem_words(skey, word_count, facet, f)

int skey, *word_count, f;
struct expression *facet;
{
  EXEC SQL BEGIN DECLARE SECTION;
    int     search_key[10], nwords, ffreq, no_stopwords;
    int     facet_no[10];
    VARCHAR temp_stem[40], word[10][40], stopw[120][25];
  EXEC SQL END DECLARE SECTION;

  int found, s, i, j, slength, flength, tff[MAX_WORDS], k = -1;
  char temp_word[40], stemmed[40], *tfw[MAX_WORDS];

  /*
  ** Read stopwords from table 'stopword' into host array stopw[]
  */

  EXEC SQL SELECT word
    INTO stopw
    FROM stopword;

  /*
  ** set 'no_stopwords' to the number of rows read in.
  */

  no_stopwords = sqlca.sqlerrd[2];

  /*
  ** NULL terminate strings.
  */

  for (i = 0; i < no_stopwords; i++)
    stopw[i].arr[stopw[i].len] = '\0';

  /*
  ** stem words
  */
```

```
for (i = 0; i < facet->nwords; i++) {
  facet_no[i] = f;
  temp_word[0] = '\0';
  search_key[i] = skey;
  sprintf(temp_word, "%s", facet->word[i]);
  flength = strlen(temp_word);
  slength = stem_phrase_token(temp_word, flength, stemmed, func, NULL);

  while (slength > 0 && stemmed[slength - 1] == ' ')
    slength--;

  stemmed[slength] = '\0';
  temp_stem.len = strlen(stemmed);
  for (j = 0; j < temp_stem.len; j++)
    temp_stem.arr[j] = stemmed[j];

  temp_stem.arr[temp_stem.len] = '\0';
  ffreq = 0;

  /*
  ** Evaluate frequency of word_stem
  */

  EXEC SQL SELECT SUM(frequency)
    INTO :ffreq
    FROM word
    WHERE :temp_stem = LOWER(stem);

  /*
  ** Count how many words are in the stop word list.
  */

  found = 0;
  for (s = 0; s < no_stopwords; s++) {
    if (strcmp(facet->word[i], stopw[s].arr) == 0)
      found++;
  }

  /*
  ** Insert into 'query_words' all words that exist in the thesaurus,
  ** i.e. ffreq > 0, and are not in the stop_word list.
  ** Set word_freq[] to ffreq if (ffreq > 0) or 0 otherwise.
  */

  if (ffreq > 0) {
    if (found == 0) {
      word[++k].len = strlen(stemmed);
      for (j = 0; j < word[k].len; j++)
        word[k].arr[j] = stemmed[j];

      word[k].arr[word[k].len] = '\0';
      word_freq[i] = ffreq;
    }
  }
  else
```

```
    word_freq[i] = 0;
 }

 /*
 ** Insert word stems into query_words.
 */

 nwords = k + 1;

 EXEC SQL FOR :nwords
   INSERT INTO query_words(key, word, facet_no)
   VALUES(:search_key, :word, :facet_no);

 EXEC SQL COMMIT;

 /*
 ** Now remove words from full_word if frequency is zero.
 ** First copy words and frequency to temp arrays.
 */

 for (i = 0; i < facet->nwords; i++) {
   tfw[i] = (char *) malloc(strlen(facet->word[i]) + 1);
   strcpy(tfw[i], facet->word[i]);
   tff[i] = word_freq[i];
 }

 k = 0;
 for (i = 0; i < facet->nwords; i++) {
   if (tff[i] > 0) {
     sprintf(facet->word[k], "%s", tfw[i]);
     word_freq[k++] = tff[i];
   }
 }
 facet->nwords = k;
 (*word_count) += k;
}


find_matching_terms(facet)

/*
** Find thesaurus matching stemmed words from <expression>, stored
** in 'query_words'.
**
** Note the clause WHERE Q.word = LOWER(W.stem)
**
** LOWER is necessary to match up words that are all capitals in the
** thesaurus (e.g. FDDI)
**
** rows are fetched in blocks of 200 from the table by declaring a
** cursor (mt) and then using the "EXEC SQL FOR :rows_to_fetch"
** statement to select "rows_to_fetch" rows into host variables.
** "rows_to_fetch" is set to 200. "rows_this_time" is initially set
** to "rows_to_fetch". sqlca.sqlerrd[2] contains the number of rows
** retrieved by the last fetch. "rows_before" is initially set to zero.
```

```
** After each fetch the code:
**
**    rows_this_time = sqlca.sqlerrd[2] - rows_before;
**    rows_before = sqlca.sqlerrd[2];
**
** sets "rows_this_time" to the number of rows retrieved by the last
** fetch and "rows_before" to the cumulative number of rows retrieved.
**
** In this way we can determine exactly how many rows have been
** retrieved when fewer than 200 are returned (e.g. the last 78 out
** of a total of 478 rows.
**
** The EXEC SQL WHENEVER NOT FOUND CONTINUE statement allows the
** process to continue without generating an exception.
**
*/

struct expression *facet;
{
  int i, rows_before = 0;
  int rows_this_time = 200;
  FILE *op;

  rows_to_fetch = 200;

  EXEC SQL DROP INDEX mt_batch;
  EXEC SQL DROP INDEX mt_key;
  EXEC SQL DROP INDEX mt_picked;
  EXEC SQL DROP INDEX mt_termno;

  fprintf(ef, "     Dropped indexes .... ");

  EXEC SQL DELETE FROM matched_terms;

  fprintf(ef, "deleted current contents of matched_terms\n");

  EXEC SQL DECLARE mt CURSOR FOR
    SELECT Q.facet_no, T.term_no, T.text, T.qualifier, SUM(300-W.frequency)
    FROM term T, component C, word W, query_words Q
    WHERE Q.word = LOWER(W.stem)
    AND W.word = C.word
    AND C.term_no = T.term_no
    GROUP BY Q.facet_no, T.term_no, T.text, T.qualifier
    ORDER BY Q.facet_no ASC, SUM(300-W.frequency) DESC, T.text ASC, T.qualifier ASC;

  EXEC SQL OPEN mt;
  EXEC SQL WHENEVER NOT FOUND CONTINUE;

  op = fopen("first_match.lst", "w");

  while (rows_this_time == rows_to_fetch) {
    EXEC SQL FOR :rows_to_fetch
    FETCH mt
    INTO :facet_number, :term_number, :term_text, :term_qualifier, :wgt;
```

```
    /*
    ** sqlca.sqlerrd[2] holds the total number of rows processed
    ** by the most recently executed SQL statement. It is set to
    ** zero when the cursor is opened and incremented after each
    ** FETCH statement.
    **
    ** For each successive iteration, "rows_before" contains the total
    ** number of rows retrieved after the previous iteration.
    ** It is initially set to zero.
    **
    ** "rows_this_time" (i.e. rows to store in the in the host arrays)
    ** is set to "sqlca.sqlerrd[2]" minus "rows_before".
    **
    ** Each row retrieved is written to the file "first_match.lst"
    **
    */

    rows_this_time = sqlca.sqlerrd[2] - rows_before;
    rows_before = sqlca.sqlerrd[2];

    for (i = 0; i < rows_this_time; i++) {
      ((facet + facet_number[i])->nrows)++;
      term_text[i].arr[term_text[i].len] = '\0';
      term_qualifier[i].arr[term_qualifier[i].len] = '\0';
      fprintf(op, "%d %d %d\n", facet_number[i], wgt[i], term_number[i]);
      fprintf(op, "%s\n", term_text[i].arr);
      if (term_qualifier[i].len > 0)
        fprintf(op, "%s\n", term_qualifier[i].arr);
      else
        fprintf(op, "%s\n", "*");
    }
  }
  fclose(op);
  EXEC SQL CLOSE mt;
  return;
}


remove_punctuation(term, dummy)

char term[132], dummy[132];
{
  int next = 0, n;
  char ch;

  for (n = 0; n < strlen(term); n++)
  {
    ch = term[n];
    if (ch == '-')
      ch = ' ';
    if (isalpha(ch) || isdigit(ch) || isspace(ch))
      dummy[next++] = ch;
  }
  dummy[next] = '\0';
}
```

```
allocate_sequence_nos(no_facets, facet)

/*
** This function determines the number of actual words from the
** user's query expression that match each thesaurus term retrieved
** by the initial matching process. Either the term will be a single
** word which exactly matching one of the words, or the word may
** occur in the term in one of three positions:
**
**   i) at the beginning:
**      i.e. <word> <space>
**  ii) in the middle somewhere (terms of 3 or more words)
**      i.e. <space> <word> <space>
** iii) at the end
**      i.e. <space> <word>
**
** Terms will then be allocated a 'sequence number' from 0 to nterms-1
** (matched_terms column 'seq_no') according to the following rules:
**
** The sort keys are: 1) nmatch - no. of words from the user's query
**                                expression that occur in the term
**                    2) nwords - no. of words in the term,
**
** The terms will be sorted into descending order of (1) and ascending
** order of (2). Thus if two terms have the same number of matching
** words, the shorter term will be allocated a lower sequence number
** so that it will appear first in the displayed list on the form.
*/

int no_facets;
struct expression *facet;
{
  int term_index, next_term, n, p;
  int found, space_count, w, f;
  char full_term[FULL_LENGTH], temp_text[FULL_LENGTH];
  char *pos, *lpos, *npos, ch;

  struct mterm {
    int facet_no, seq_no, nwords, weight, term_no;
    char text[80], qualifier[50];
  };

  struct mterm nt;

  struct twords {
    char word[MAX_WORDS][3][MAX_WORD_LENGTH];
  };

  struct twords *temp = NULL;

  FILE *ip, *op;

  /*
  ** Place in temp[f]->word[n][p] words as they might appear in a phrase,
```

```
** i.e. word<space>  <space>word<space>  <space>word
**
** Index 'n' is the word number for each facet (0 .. facet[f]->nwords - 1)
** Index 'p' is a number (0 .. 2) corresponding to the 3 possible
** positions of the word in the term.
*/

op = fopen("sequence_nos.lst", "w");
ip = fopen("first_match.lst", "r");

temp = (struct twords *) malloc(sizeof(struct twords) * no_facets);
if (temp == NULL) {
  printf("Not enough memory for twords\n");
  exit(0);
}

for (f = 0; f < no_facets; f++) {
  for (n = 0; n < (facet + f)->nwords; n++) {
    for (p = 0; p < 3; p++) {
      switch (p) {
        case 0 :
          sprintf((temp + f)->word[n][p], "%s ", (facet + f)->word[n]);
          break;
        case 1 :
          sprintf((temp + f)->word[n][p], " %s ", (facet + f)->word[n]);
          break;
        case 2 :
          sprintf((temp + f)->word[n][p], " %s", (facet + f)->word[n]);
          break;
      }
    }
  }
}
/*
** Concatenate (term / qualifier) & remove punctuation if any.
** Result returned in temp_text.
**
** first_match.lst structure:
**
**    "%d %d %d\n" , facet_no, wt, term_no
**    "%s\n", text
**    "%s\n", qualifier
**
** qualifier = "*" is there is not one.
*/

do {
  fscanf(ip, "%d %d %d\n", &nt.facet_no, &nt.weight, &nt.term_no);
  fgets(nt.text, 80, ip);
  nt.text[strlen(nt.text) - 1] = '\0';
  fgets(nt.qualifier, 50, ip);
  nt.qualifier[strlen(nt.qualifier) - 1] = '\0';
  nt.seq_no = 0;
  space_count = 1;
  full_term[0] = '\0';
```

```
sprintf(full_term, "%s", nt.text);

/*
** add <space><qualifier> onto end of full_term if non-null qualifier
*/

if (nt.qualifier[0] != '*')
  sprintf(full_term + strlen(full_term), " %s", nt.qualifier);

temp_text[0] = '\0';
remove_punctuation(full_term, temp_text);
sprintf(full_term, "%s", temp_text);

f = nt.facet_no;
/*
** Count number of words in the term by counting the number of spaces.
** Count stored in num_words[].
*/

for (w = 0; w < strlen(full_term); w++) {
  if (full_term[w] == ' ')
    space_count++;
}

/*
** Find pointer to last space in full_term
*/

if (space_count > 1)
  lpos = strrchr(full_term, ' ');

/*
** Find pointer to NULL terminator
*/
npos = strchr(full_term, '\0');

nt.nwords = space_count;

/*
** The integer variable 'found' returns a value of 1 if a statement is
** TRUE or 0 if FALSE. It is initialised by the statement:
**
** found = (strcasecmp(full_term, full_word[n]) == 0);
**
** If found = TRUE (1) => word exactly matches a a single word term.
** If found = FALSE (0) then we check to see if the word occurs in
** the term in any of the three positions.
**
** A word will only be counted once, even if it appears twice
** in the term (i.e. successive switch cases below will only be
** executed if the previous test was negative.
*/

for (n = 0; n < (facet + f)->nwords; n++) {
  pos = NULL;
```

```
    found = (strcasecmp(full_term, (facet + f)->word[n]) == 0);

    if (!found) {
      for (p = 0; p < 3; p++) {
        switch (p) {
        case 0 :
        pos = strstr(full_term, (temp +      nt.facet_no)->word[n][p]);
        found = ((pos != NULL) && (pos == &full_term[0]));
        break;
        case 1 :
        if (!found) {
        found =
        (strstr(full_term, (temp + nt.facet_no)->word[n][p]) != NULL);
        break;
        case 2 :
        if (!found)
        found =
        ((strstr(full_term, (temp + nt.facet_no)->word[n][p]) == lpos) &&
        ((npos - lpos) == strlen((temp + nt.facet_no)->word[n][p])));
        break;
        }
}
}
if (found) {
/*
** Increment the word count (sqn[]) for the term.
*/
       nt.seq_no++;
     }
   }
   fprintf(op,
         "%d %d %d %d %d\n",
         nt.facet_no, nt.seq_no, nt.nwords, nt.weight, nt.term_no);
  }
  while (!feof(ip));
  fclose(ip);
  fclose(op);

}

seq_cmp(p1, p2)

struct sterm *p1, *p2;
{
  register int to_swap = -1;

  to_swap = (p1->facet_no < p2->facet_no);
  if (!to_swap) {
    to_swap = (p1->seq_no < p2->seq_no);
    if (!to_swap) {
      if (p1->seq_no == p2->seq_no) {
        to_swap = (p1->weight < p2->weight);
        if (!to_swap)
          to_swap = (p1->nwords > p2->nwords);
      }
```

```
    }
  }
  return to_swap;
}

sort_terms(concept, no_facets, row_count)

/*
** Terms are sorted by the following 3 keys:
**
** 1) seq_no (no. matching words) -- ASC
** 2) nwords (no. words in term)  -- ASC
** 3) weight                      -- DESC
*/

int no_facets, *row_count;
struct expression *concept;
{
  int i, swaps, max, ptemp, to_swap, r = 0, f;
  int sq, nw, wt, tn, fn;
  struct sterm *st = NULL;
  FILE *ip, *op;

  ip = fopen("sequence_nos.lst", "r");
  op = fopen("sequence_nos.srt", "w");

  for (f = 0; f < no_facets; f++) {
    st = (struct sterm *) malloc(sizeof(struct sterm) * (concept+f)->nrows);
    if (st == NULL) {
      fprintf(stderr, "Not enough memory for malloc()\n");
      exit(0);
    }

    rewind(ip);
    r = 0;
    while (!feof(ip)) {
      fscanf(ip, "%d %d %d %d %d\n", &fn, &sq, &nw, &wt, &tn);
      if (fn == f) {
        (st+r)->facet_no = fn;
        (st+r)->seq_no = sq;
        (st+r)->nwords = nw;
        (st+r)->weight = wt;
        (st+r)->term_no = tn;
        r++;
      }
    }

    (void) qsort((char *) st, r, sizeof(struct sterm), seq_cmp);
    (concept + f)->nrows = (r > 100) ? 100 : r;
    *row_count += (concept + f)->nrows;

    /*
    ** Once list is ordered set sqn[] to ascending values from 0 .. nterms - 1
    */
    for (i = 0; i < (concept + f)->nrows; i++)
```

```
      fprintf(op, "%d %d %d %d\n", (st+i)->facet_no, i, (st+i)->weight, (st+i)->term_no);

    if (st != NULL)
      free(st);
  }
  fclose(ip);
  fclose(op);
}

insert_rows(row_count)

int row_count;
{
  EXEC SQL BEGIN DECLARE SECTION;
    int     key[400], tnumber[400], facet_no[400];
    int     nnt[400], nbt[400], nrt1[400], nrt2[400], ndocs[400];
    int     weight[400], seq_no[400];
    int     rcount;
    EXEC SQL END DECLARE SECTION;

  EXEC SQL WHENEVER SQLERROR GOTO insert_error;

  int i, m = 100, f, c, k;
  FILE *ip, *op;

  /*
  ** First set the Oracle host variables declared in this function
  ** to the values stored in the 'C' variables.
  */

  c = row_count;

  ip = fopen("sequence_nos.srt", "r");

  for (i = 0; i < row_count ; i++) {
    key[i] = search_key;
    fscanf(ip, "%d %d %d %d\n", &facet_no[i], &seq_no[i], &weight[i], &tnumber[i]);
    printf("%d %d %d %d\n", facet_no[i], seq_no[i], weight[i], tnumber[i]);
  }

  rcount = row_count;
  /*
  ** Now insert rows into table matched_terms
  */

  EXEC SQL FOR :rcount
    INSERT INTO matched_terms
    SELECT :key, :tnumber, :facet_no, T.text, T.status, T.qualifier, T.struc_ind, T.num_nt, T.num_bt,
T.num_rt1, T.num_rt2, T.num_docs, '', 0, '0', '', '', 0, :weight, 0, :seq_no, ''
    FROM term T
    WHERE T.term_no = :tnumber;

  EXEC SQL COMMIT;

  fprintf(ef, "     Inserted %d rows\n", rcount);
```

```
EXEC SQL CREATE INDEX mt_termno ON matched_terms(term_no);

fprintf(ef, "     Created index 'mt_termno'\n");

/*
** Now insert into matched_terms the appropriate values for the preferred
** terms for each leadin. These are found from the 'equivalence' table
** where equivalence(term_no1) = leadin's term_no, and
** equivalence(term_no2) = preferred term's term_no.
*/

EXEC SQL INSERT INTO matched_terms
  SELECT M.key, T.term_no, M.facet_no, T.text, T.status, T.qualifier, T.struc_ind, T.num_nt, T.num_bt,
T.num_rt1, T.num_rt2, T.num_docs, '', 0, '0', '', '', 0, M.weight, M.term_no, M.seq_no, ''
  FROM term T, matched_terms M, equivalence E
  WHERE M.status = 'L'
  AND M.term_no = E.term_no1
  AND T.term_no = E.term_no2;

  EXEC SQL COMMIT;

/*
** Update the 'picked' column of matched_terms for terms that occur more
** than once in the list (the extra terms will be those inserted as
** preferred terms for leadins above.
*/

EXEC SQL UPDATE matched_terms
  SET picked = '*'
  WHERE preferred IN
  (
    SELECT A.term_no
    FROM matched_terms A
  );

EXEC SQL COMMIT;

EXEC SQL CREATE INDEX mt_batch ON matched_terms(batch);
fprintf(ef, "     Created index 'mt_batch'\n");

EXEC SQL CREATE INDEX mt_key ON matched_terms(key);
fprintf(ef, "     Created index 'mt_key'\n");

EXEC SQL CREATE INDEX mt_picked ON matched_terms(picked);
fprintf(ef, "     Created index 'mt_picked'\n");

return;

insert_error:
  printf("\n% .70s \n", sqlca.sqlerrm.sqlerrmc);
  EXEC SQL WHENEVER SQLERROR CONTINUE;
  EXEC SQL ROLLBACK WORK RELEASE;
  exit(1);

}
```

Appendix U

Scripts in AWK for Source Term Selection and Batch Ranking

kod-it (term selection)

```
#!/bin/sh


batches="888"

nos="1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28"

for b in $batches
do
 km1 $b <mtchd-cvision+detect>temp1
 for n in $nos
  do
   kpt $n $b
  done
pf>>res999.aw56.f4_wpq
rm -f temp1
done
```

kod-it (batch selection)

```
#!/bin/sh


batches="0 1 2 3 4 5 6 8 9 10 11 13 16 18 21 22 23 24 26 28 51 52
55 57 60 62 63 65 66 67 70 72 74 75 76 77 78 80 82"

nos="1 2 3 4"

for b in $batches
do
 km1 $b <lnkd-edgdtct+cvision.5g>temp1
 for n in $nos
  do
   kpt $n $b
  done
pf>>res40.aw75.f4_wpq.5g
rm -f temp1
done
```

The rest of the scripts are used in both term and batch selection calculations.

kpt

```
#!/bin/sh


n=$1
b=$2

km2 $n<temp1 |\
bss0 |\
km4 2/dev/null |\
km5  |\
bss0 |\
km7 2/dev/null |\
km8_wpq |\
bss0 |\
km8_wpq.a 2/dev/null |\
km9 $b  >> res40.aw75.f4_wpq.5g
```

km1

```
#!/bin/sh

batch=$1
awk '


$1=="Batch" {
     if ($2==batch) { s = 1}
                else s = 0 }

$1 < 5 && s == 1 {
                    printf"%s\n" ,$0
                       }
                          ' batch=$batch
```

km2

```
#!/bin/sh
num=$1
awk '

#

BEGIN {print "ch inspec.B"}
{if ($1==num) {s=1} else s=0 }

BEGIN {printf"%s%s%s", "p ","a=de ", "t="  }
```

```
{if (s==1)
    for (i=2; i<=NF; i++)
        printf"%s ",$i }

END {printf"%s\n"," "
    print "q" }
'     num=$num
```

km4

```
awk '


NF==0 { next }


{ if ($2 !=  "OK")
 {

  for (i=3; i <= NF; i++) {
    printf " %s",$i }
    print " "
    }
  }'
```

km5

```
awk '

BEGIN {
print "\n", "ch inspec.B"

print "\n", "f","t=computer"
print "\n", "f","t=vision"
print "\n", "f","t=detection"
printf"\n"
printf "%s%s", " f ","a=de "      }


      { for (i=1; i<=NF-1; i++)
         {   printf "%s "   , $i } }
         {   print  $NF          }
       END {   print "\r"          }

     END { print "\n" " f s=0 w=11"
          print "\n" " f s=1 w=52"
          print "\n" " f s=2 w=50"
          print "\n","f"," s=4 s=5 s=6 op=bm11 aw=75"
          printf "%s" " f s=3 s=7 op=and"
          printf"\n"
```

```
        printf"\n"
        print "q"   }

              '
```

km7

```
awk '


$3=="S3" {  for (i=3; i<=NF; i++)
            printf "%s ",$i
            printf"%s\n", " "  }

$2=="S8" {    for (i=2; i<=NF; i++)
            printf "%s " ,$i
             printf"%s\n", " "  } '
```

km8_wpq

```
awk '

{if ($1=="S3") {  y=substr($2,4,12)  } }
{if ($1=="S8") {  x=substr($2,4,12)    } }
{if ($3~/^[t]/)  {  k=substr($3,1,19) } }

BEGIN {
print "\n", "ch inspec.B"  }

END {  printf"%s%s%s%s%s\n", "p ", k," thelittler",x
      printf"%s%s%s%s %s%s %s", "w ","f=1 ", "n=",y, "r=",x, "bigr=953"
      printf"\n"
      print "q"  }
```

km8_wpq.a

```
nawk '

{if ($3~/^[t]/)  {  u=substr($3,1,19) } }
{if ($4~/^[t]/)  { the_little_r=substr($4,13,8) } }
{if ($2 ~ /^[-]?[0-9]/ && $3 !~ /^[t]/) { v=substr($2,1,6)   } }

term_sel_value=v * the_little_r

END { printf "%s%s%s%s",u, ".. ", "W= ",term_sel_value  }
```

km9

```
#!/bin/sh
batch=$1

awk '


$1 ~ /^[t]/ {  printf"%s%s %-25s%s %s\n" ,"Batch ",batch, $1,$2,$3  }

 ' batch=$batch
```

Appendix V

Queries Used in Experiments 1 and 2

Experiment 1

User 1: expert systems education

User 2: tracking noise edge

User 3: hypertext technical manual database

User 4: conceptual graphical query language

User 5: texture detection fractals

User 6: online information evaluation quality reliability

User 7: polarisation mqw splitter

User 8: cd-rom networking

Experiment 2

User 1: object database benchmarks

User 2: computer vision detection

User 3: hypertext and internet

User 4: UV spectroscopy database

User 5: impact information technology disabled

User 6: neural water pollution

User 7: optical fiber position

User 8: expert systems object oriented development