A rapidly changing scenario - I

Searching the literature: techniques and methods in rapid progress and mutation

- Paper catalogues
- Electronic catalogues
- World Wide Web & Internet (1990s)
- Google (2000s - now)
- . . . . what’s next?
A rapidly changing scenario - II

From paper catalogues to recent search algorithms (i.e. google) the change is not limited to the support (electronic vs. paper) but expands to the overall approach of retrieving information

- Metadata
- Ranking and statistical analysis
- Personalised searches
- Automated suggestions
- RSS
A rapidly changing scenario - III

• **2006-2008** : Conference paper proceedings are being abandoned in favour of electronic versions only. This is also caused by higher quality screens that allow for more comfortable reading.

• New paper-like screens, e-book readers and annotation tools are rapidly improving in quality and gaining visibility on the market.

⇒ All new scientific material (not only titles or abstract) is available to search algorithms and easily retrievable. **BUT** old papers and books might not be in electronic format.
Searching Case I (easy)
we know what we are looking for

• One’s supervisor tells the student to go to the library and read books on Machine Learning/Neural Networks/Robotics (check [http://library.bham.ac.uk](http://library.bham.ac.uk) for books, loans, interlibrary loan)

• The journal *ABC* contains good papers on one’s topic, one goes online or to the library and reads some papers from recent years

• One has paper A that cites papers B1, B2, B3 and he is interested retrieving and reading papers B1, B2, B3.
Searching Case II (difficult)

we don’t know what we are looking for

• One has topics, keywords, ideas and performs a wide search on many catalogues, search engines (could be frustrating when nothing can be found)

• One comes from a different field and would like to find more on interdisciplinary areas (for instance scientists with background in biology working in Computer Science and vice versa)

• One is curious about some field and would like to expand his knowledge or ascertain ideas or intuitions
Search engines

• List of search engines at: http://www.cs.bham.ac.uk/~aqs/RS/search.html

• Use of operators, wild-cards:

READ SEARCH TIPS!
- i.e. ACM search tips (http://portal.acm.org/search_help.cfm)

• Read how to perform ADVANCED SEARCHES
Research Skills

Using keywords

• To retrieve papers, but also to find departments, people
• Read papers, find new keywords, repeat search
• Example of different terminology related to close concepts
  - Genotype-phenotype (indirect) mapping
  - L-systems
  - Developmental Systems
  - Artificial Ontogeny
  - Computational Embryogeny
  - Cellular Encoding
  - Morphogenesis
  - Artificial Embryogeny
Research Skills

Finding the work done for you: review papers

- Often review papers save us plenty of time because they contain references to a large number of related works.
- Present a field and list its sub-fields in a logical organised manner.
- Capture and present us the main messages of cited papers in a concise and clear way.
Tracking citations forward in time

It could be interesting to find who is citing a certain paper and discover more recent developments in the field

- Google scholar
- ISI Web of Knowledge
- ...

However, the method is not accurate and results can be incomplete or wrong
Access to resources

Universities usually are subscribed to electronic resources and journal archives

• Make sure you authenticate at http://athens.bham.ac.uk

• If not on campus, establish tunnelling via VPN

• If the resource is not available, search the web or the authors’ web page

• If all attempts fail, email the authors
Extra - not only computers: literature search by social means

- From **idea** to paper publication and date of availability on electronic databases there could be a **1-3 year delay**

  ➡ To be really up-to-date, informal talks and social connections with researchers in the field are the best way

- Have a ready, short description of your research interests for informal talks with colleagues and listen to other people

  ➡ Social networks can be useful for literature search and help being aware of other people work