# COMP 516
# Research Methods in Computer Science

**Dominik Wojtczak**

**Department of Computer Science**
**University of Liverpool**

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## Lecture 5: Literature searches

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# Academic English Classes

- for all international students and staff members
- Monday 1st October - Friday 14th December 2012
- no need to register for these classes (but take your student card)
- e.g. every Monday 13.00- 14.00 Grammar & Vocabulary in MATH-105 and repeated Tuesday 12.00-13.00 in GHOLT-H223
- many more classes: Academic Writing, Academic Reading, Academic Speaking & Pronunciation, Academic Listening, Britain Today

`http://www.liv.ac.uk/english-language-centre/academic_english_classes_for_all_international_students_and_staff/`

or click “Useful resources for COMP516” at

`https://cgi.csc.liv.ac.uk/~dominik/teaching/comp516`

# Academic English classes for International MSc Students

- discipline-specific language classes
- all overseas students are expected to enroll on this module
- Monday 8th October - Friday 14th December 2012
- Classes for CS: Monday 15:00-16:00 in ELEC-204 (E4), first class: Monday 8 October 2012
- Scientific English: Wed 15:00-17:00 in MATH-103, first class: Wed 10 October 2012

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# Clarification about the Essay (1)

- the presentation/essay for COMP516 is not related to your final MSc project (COMP702)
- MSc project is almost always picked from a list (available at the end of semester 2)
- it is sometimes possible to propose a new MSc project, but that requires finding a suitable supervisor

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# Clarification about the Essay (2)

- the topic for your COMP516 essay can be anything that interests your and is related to CS
- alternatively, pick some topic listed at the COMP516 webpage
- you will submit the topic of your essay online via a form
- in a unlikely event that this topic is not suitable I will ask you to pick a new one
- another possibility is to pick as your essay topic an MSc project was not picked last year
- `https://cgi.csc.liv.ac.uk/~comp702/` and use your CS login/password (not MWS) ....
- however, once picked one should confirm that the project will still be available this year

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# Barclays Lectures: Insights into IT

- a series of 8 lectures by Barclays representatives
- the poster is just outside
- every Wednesday at 1pm in Ashton Lecture Theatre, starting this week (3 October 2012)
- IT related topics: security, cloud computing etc.
- directly related to the material in COMP516, e.g. project management, risk assessment
- would help you to make the connection between theory and practice

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# Searching for Literature

- What are you trying to find out?
  - ⇝ Try to specify exactly what you need to know
- What type of information do you want to find?
  - ⇝ An answer to a specific question?
  - ⇝ An overview of a subject area?
  - ⇝ A specific document?
- Why do you need this information?
  - ⇝ Literature survey: Information needs to be comprehensive
  - ⇝ Short essay: Limited number of sources is sufficient
- How quickly do you need the information?
  - ⇝ Immediately: Internet
  - ⇝ In a day: Library
  - ⇝ In a week: Inter Library Loans

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# Searching for Literature

Consider the following tasks:

1. Obtain a paper copy of the following article:

   *P. McBurney, S. Parsons and M. Wooldridge (2002): Desiderata for agent argumentation protocols. In: C. Castelfranchi and W. L. Johnson (Editors): Proceedings of the First International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2002), pp. 402–409, Bologna, Italy. July 2002. New York, USA: ACM Press.*

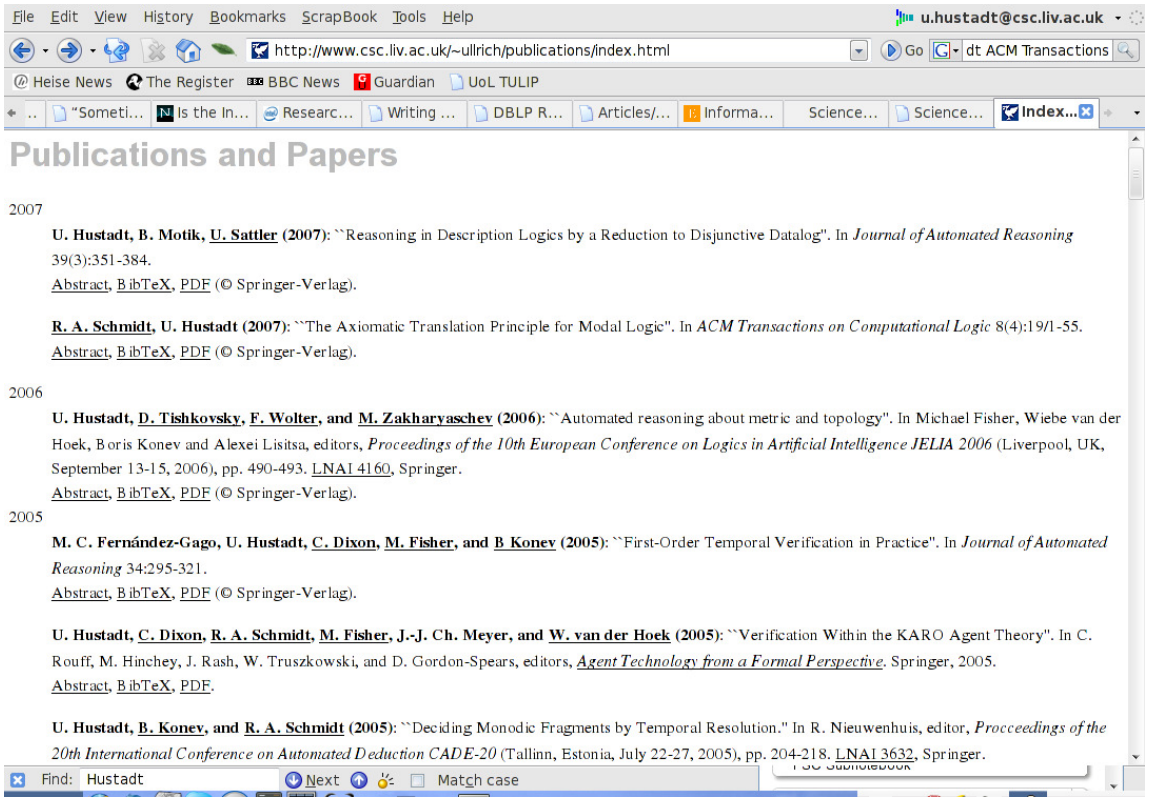
2. Find out which other publications refer to the article above.

How would you accomplish these tasks?

# Where to Search: Sources

Sources for literature on the internet:

- Freely available collections (personal/institutional)




- Publishers' websites/databases
- Literature databases

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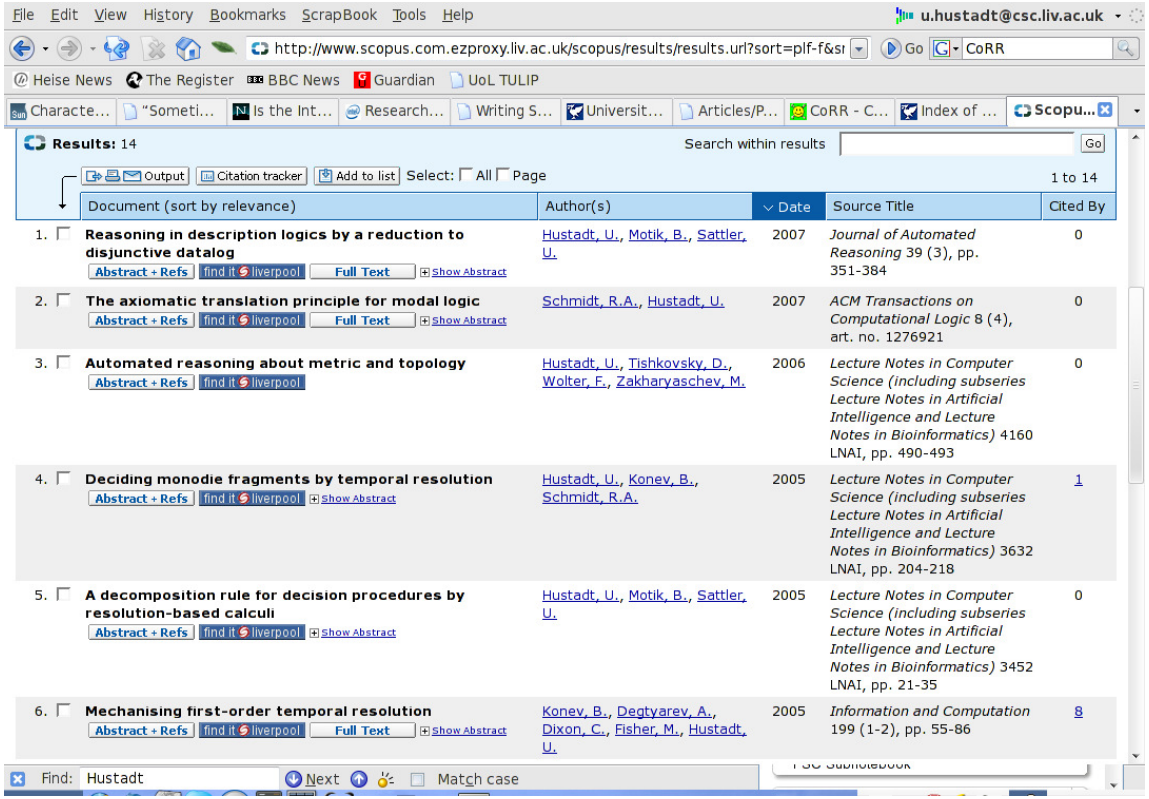

# Where to Search: Interrelationship of Sources

1. Authors submit paper to conference/journal for peer review
2. If accepted, the paper is revised by the authors and submitted to conference/journal editor
3. The paper is processed to bring it into the publisher's format (typesetting/layout)
4. The paper is then
   - included in the publisher's database,
   - made available on-line via the publisher's website, and
   - possibly published in printed form

   (not necessarily in that order)
5. Literature databases
   - collect the bibliographic information from several publishers
   - add additional information (references with links, citation index)
   - link back to publisher for full-text of papers

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# Databases and Search Engines: Publishers

Our library has subscriptions to many publishers' databases:

| | |
|---|---|
| ACM Digital Library | Full-text of all ACM journals and conference proceedings<br>`http://portal.acm.org.ezproxy.liv.ac.uk/dl.cfm` |
| IEEE Xplore | Full-text of IEEE journals, conference proceedings, and books<br>`http://ieeexplore.ieee.org.ezproxy.liv.ac.uk/` |
| ScienceDirect | Full-text of Elsevier journals<br>`http://www.sciencedirect.com.ezproxy.liv.ac.uk` |
| SpringerLink | Full-text of Springer journals, conference proceedings, and books<br>`http://www.springerlink.com.ezproxy.liv.ac.uk/` |
| Wiley InterScience | Full-text of Wiley journals and books<br>`http://www.interscience.wiley.com.ezproxy.liv.ac.uk/` |

Access to full-text requires authentication by MWS login and password

# Databases and Search Engines: Literature Databases

The University Library has subscriptions to many literature databases:

| | |
|---|---|
| Scopus | Covers 14,000 journals and proceedings series; incl. ACM, Elsevier, IEEE, Springer `http://www.scopus.com/` |
| Web of Knowledge | Covers 22,000 journals and 192,000 proceedings; incl. ACM, Elsevier, IEEE, Springer `http://isiknowledge.com/` |
| DISCOVER (UoL) | Meta search engine for ACM Digital Library, IEEE Explore, etc but also Scopus, Web of Science and Google Scholar `www.liv.ac.uk/library/e-library/eds.html` |

Adding `.ezproxy.liv.ac.uk` to the server name again allows access from outside the campus using your MWS login and password for authentication

# Databases and Search Engines: Web Search Engines

Freely available (scholarly) web search engines include:

| | |
|---|---|
| Citeseer | Digital library of 750k freely available papers in computer and information science<br>`http://citeseer.ist.psu.edu/` |
| Google | General internet search engine<br>`http://www.google.co.uk` |
| Google Scholar | Searches scholarly literature on the web.<br>`http://scholar.google.com` |
| Scirus | Searches journals (ScienceDirect) and web resources<br>`http://www.scirus.com/` |
| Windows Live Search Academic | Academic search engine - search academic journals and content for article titles, author names, article abstracts, and conference proceedings.<br>`http://academic.live.com/` |

# Databases and Search Engines: Comparison

- All these databases and search engines, and many more, are accessible from one central point:

  `http://atoz.ebsco.com.ezproxy.liv.ac.uk/Customization/Tab/11404?tabId=8591`

- The library's own catalogue is available at

  `http://library.liv.ac.uk/`

- There is an important difference to remember:

  Library catalogue: Allows to search for a journal, but not for journal articles

  Publishers' and literature databases: Allow to search for journal articles, but not in the full-text journal articles

  Web search engines: Allow to search in the full-text of journal articles, but have difficulties with their structure

# Databases and Search Engines: Comparison

- Literature databases cover a vast number of journals and conferences, but they
  - do not cover all journals and conference
  - do not cover textbook, handbooks, collections of articles in book form
  - do not cover workshops and similar scientific meetings
  - do not cover technical reports and pre-prints
- Web search engines provide much better coverage of these types of publications, but
  - typically also return a lot of irrelevant material to a query
  - leave it to the user to distinguish high quality from low quality material

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# Queries (1)

- Search terms might be simple keywords, phrases, or consist of field identifiers, modifiers, operators, and keywords

  Examples: induction
  “mathematical induction”
  induct∗
  author = Ambuhl
  author like Ambuhl
  author soundex(Maier)

- Queries are typically constructed from search terms using boolean operators

  Examples: induction AND mathematical
  induction OR deduction
  induction AND NOT recruitment

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# Queries (2)

- Queries are typically constructed from search terms using boolean operators
  - AND retrieves records where ALL of the search terms are present, induction AND mathematical
  - OR retrieves records containing either one term OR another induction OR deduction
  - NOT retrieves records NOT containing a particular term NOT recruitment
- The set of all correct queries for a particular search engine is its query language
- Typically, different search engines use different query languages

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# Keywords

- Only the right keywords will correctly identify useful information
- Mode of search is very important:
  - narrow: you are looking for exactly one record
    - ⇝ use a search term which is as specific as possible
      "cell microprocessor" instead of cell
    - ⇝ use additional criteria
      - publication date year = 2006
      - type type = journal
      - language language = english
      - publisher publisher = Springer
  - wide: you are looking for all records relating to a subject

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    - ⇝ use additional criteria
      - publication date year = 2006
      - type type = journal
      - language language = english
      - publisher publisher = Springer
  - wide: you are looking for all records relating to a subject
    - ⇝ try alternative words/phrases
      microprocessor / computer processor / computer chip
    - ⇝ try alternative spellings
      judgement / judgment
    - ⇝ try wildcards
      gene∗ for genes, genetics, genetically

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1. Construct a query
2. Search the databases, starting with the literature databases then moving to web search engines
3. Record all useful references
   ⇝ some databases allow export in a format that can be Record imported in RefWorks or EndNote
   enough information for someone to be able to find it again
4. After having searched two or three sources,
   review the progress of the search
   too little relevant sources found so far ⇝ modify query

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1. an offline/online reference manager
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Other (only online) systems with similar functionality are
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