COMP 516 Research Methods in Computer Science

Dominik Wojtczak

Department of Computer Science University of Liverpool

COMP 516 Research Methods in Computer Science Lecture 4: Choosing or proposing a project

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1 What sources of information could be used to devise a research-oriented project?

2 Given a collection of proposals for research-oriented projects, what criteria could you use to select the most suitable one?

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Proposals by academic staff or departments

- Past projects
- Brainstorming
- Your own goals and learning objectives
- Reading about / working in the subject area
- Systematic analysis of the subject area
 - Research Territory Maps
 Show how topics related to each other
 - Relevance Trees
 Break down a particular subject or research question into lower and lower levels of detail

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Spider Diagrams

Combines features of Research Territory Maps and Relevance Trees

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Research Territory Maps: Example



Figure 3.1 A high-level RTM for the field of software engineering

Relevance Trees: Example



Figure 3.2 An example relevance tree for the field of artificial intelligence

Spider Diagrams: Example



Figure 3.3 An example spider diagram for the field of software engineering

The project needs to be within your capabilities

- The project needs to have sufficient scope
- The project needs to interest you
- The project needs to have a serious purpose
- The project needs to have a clear outcome
- The project needs to be related to your degree programme
- The resources required are available or can be obtained

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Iq Noble Prize

awared since 1991, for achievements that "first make people laugh, and then make them think"

- 2006 Chemistry: "Ultrasonic Velocity in Cheddar Cheese as Affected by Temperature".
- 2006 Mathematics: for calculating the number of photographs that must be taken to (almost) ensure that nobody in a group photo will have their eyes closed.
- 2007 Linguistics: for determining that rats sometimes can't distinguish between recordings of Japanese and Dutch played backward
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Is the topic meaningful? Will it be of value for anyone? What contribution will it make?

Justification

Can you explain your project and justify it in simple terms?

Estimating your understanding

Can you put a figure on what you know about your chosen subject?

Contacts

Are the contacts you require for your project (including your supervisor) available, accessible, and willing to help?

Project proposal

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Project proposal

Preparing a Project Proposal: Implicit Content

Introduction to the subject area

- Sets the context for the project
- Should motivate the relevance of the subject area

Overview of current research in the area

- Demonstrates current activities in the subject area
- Shows your understanding of current research

Identify a gap

Identify a need for further investigation or re-interpretation

Identify how your work fills the gap

Explain how your project fills the gap

Identify risks and solutions

- Highlight the benefits that can be derived from your project
- Account for the risks to your project

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Clear, Concise, Preferably no acronyms

Aims and Objectives

Aims: Broad statement(s) of intent Identify the project's purpose

Objectives: Identify specific, measurable achievements Quantitative and qualitative measures by which completion of the project can be judged

Expected outcomes/deliverables Identify what will be produced/submitted in the project

Keywords

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Preparing a Project Proposal: Explicit Structure (2)

Introduction/Background/Overview

- Overview of the project (Identification of research questions and hypotheses, elaboration of aims)
- Motivation for the project
- Motivation for you conducting the project

Related Research

Identifies other work and publications related to the topic

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Methods

Identifies the resources that will be needed for the project (e.g. hardware, software, data, personnel)

Project Plan

More or less detailed 'timetable' for the project

Deadlines for deliverables

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Project Plan

- More or less detailed 'timetable' for the project
- Deadlines for deliverables

- Choosing the right project is an important stage crucial to your success
- There are a number of techniques that can assist you
- In a project proposal or project specification
 - stick to the required structure and
 - address all the guiding questions as precisely as possible

Further reading:

Sharp et al. (2002) proposes five questions that might help you to choose a project supervisor; see (Dawson 2005; p. 52).

Presentation & short bibliography on an agreed subject (15%)

- subject to be agreed by Friday 19 October 2012
- slides and bibliography due by 17:00 Friday 2 November 2012
- accounts for 15% (estimate 20 hours to complete)
- presentation: 3 slides, 5 minutes talk each + 1 minute for questions
- all of them take place during the 8 lectures between the 5th and 20th of November
- the order will be chosen randomly, 7 speakers per lecture
- the starting point for your essay (55%)
- the topic can be changed if really necessary

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 any current research topic or current technological development in Computer Science

a good essay will

- help the reader to gain an understanding of the concepts involved in the subject area of the essay
- provide an overview of the current state, possibly together with some historical information of the subject area
- cover debates, different points of views, open questions, directions of future research and development in the subject area
- especially good are topics where there is debate between two sides holding opposing views, e.g. pros and cons of software patents
- in such a case the essay should present both sides and try to evaluate their arguments

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- 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

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