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CO3808 Honours Degree Project

Introduction, SoA, Methodology

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Where opportunity creates success

Today’s Learning Objectives

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- Review the requirements of the other parts of the next deliverable
  - Introduction
  - Methodology
- Discuss finding and filtering technical literature
- Explore what research methodology is and how it differs from development methodology

Assignment Update

- Second Deliverable: Due 28th November 2025

- Deliverable 2 is worth 15% of your overall project mark
  - Worth taking some time to get this right

- You should all have your marks for Deliverable 1 Soon!
  - I will chase supervisors who have not returned marks to me today and tomorrow

Deliverable 2

- You are to submit the first three sections of your project report!
- Should be approximately 4000 words
- Section 1 – Introduction
  - Where you expand on your proposal
- Section 2 – State of the Art
  - Where you review the current body of knowledge relating to your project
- Section 3 Methodology
  - Outline a high level plan for how you are going to address the problem you have identified

Word Split per Section

- You have 4000 words in total for this deliverable +/- 20%
- Different project will require different section lengths per deliverable
  - E.g. A project that is more research flavoured rather than straight development may have a bigger ‘methodology section’
- As a general guide, most project will be around
  - Intro (between 500 to 1000 words)
  - State of the Art (between 3000 words)
  - Methodology (between 500 to 1000 words)
- Don’t exceed the 4000 total word limit (+/- 20%)

Report Template

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- Available on Blackboard
- Use this template for all your deliverables
- Add the relevant sections to it incrementally with each deliverable submission
  - You are building your final report with each submission
- Use the styles in MS word to mark up content
  - Auto generates table of contents, figure and table listings
- There is a citation manager built into work and instructions included in the template to use if you wish
  - Be consistent in your referencing/citation style
  - If you are used to using Harvard referencing and are happy using Harvard, use Harvard

Introduction

Introduction

- Identify WHAT the problem is
  - Break this down into component parts if necessary
- Discuss any appropriate standards and legal implications at this point
- Indicate WHY the problem is significant and worthy of attention
  - You should discuss the impact of both solving and not solving your stated problem at this point
- Discuss HOW you are going to work towards solving the problem
  - State a single high level aim within the context of the problem defined
  - State 6 to 8 objectives that are progressive and measurable that work towards meeting the above aim

By the end of the intro the reader should know what you are doing, why you are doing it and what objectives will get you towards a solution

Introduction

- You are EXPANDING your problem statement from the proposal

- There will be some repetition from your proposal here
  - You can think of think of this as the START of your report
  - Don’t just copy/paste from the proposal, expand

- Provide citations to support your case
  - Lacking in few proposals I looked at in my marking/second marking
  - Put references at the end of the report in the ‘references’ section (not at the end of the methodology)
    - You will have 1 ‘references’ section for your whole report

Introduction

- You should state a single high level aim within the context of the problem defined

- List 6 to 8 measurable objectives
  - These are NOT requirements at this point (that comes with the Design and Implementation deliverable)
  - These are higher level objectives that will get you from ‘problem’ space to solution
    - Most likely technology agnostic at this point
  - Your ‘Methodology’ section (more on that later) is you PLAN for how you are going to meet these objectives.

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State of The Art

State of the Art

- A condensed Literature Review
- This will be your largest section in this deliverable
- Review current body of knowledge in your problem area
- This helps clarify the boundary between what is known and not known in this space
- Should be academic in tone, see ‘background and related work’ sections of academic papers for examples of how these should look
- In discussing the existing body of knowledge you can also note the methodologies they used
  - Will help lead nicely into your own methodology section

Finding References

- Citing work (or ‘providing references’) is all about telling people where you got your information from and supporting claims you make
- It **isn’t** about finding random quotes relating to your problem space
  - You don’t need to quote to cite work
  - You also don’t need to explicitly state an author by name
    - By saying things like ‘research suggests you don’t need to provide quotes in references (Cassidy 2025)’
- Search google scholar for publications relating to your problem space
  - This is ok, but you can go deeper and get better results in subject specific digital libraries
- ACM Digital Library
- IEEE Xplore

You can chase references – If you find a highly relevant paper, what papers do THEY reference?

ACM Digital Library

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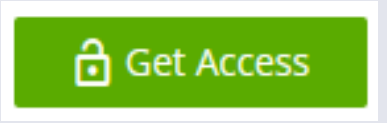
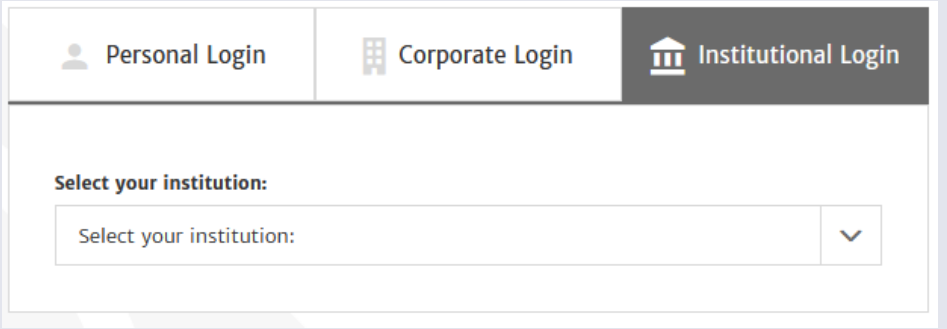
- https://dl.acm.org

- Accessible with you UCLan credentials
  - Via ‘institutional login’

- Relevant papers may also contain references themselves that you may want to chase up

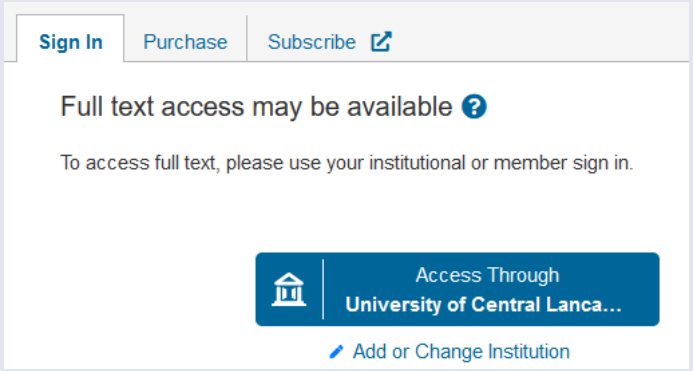
- Let’s see a demonstration





IEEE Xplore

- https://ieeexplore.ieee.org
- Also accessible with your UCLan credentials
- IEEE papers tend to be a little more technical rather than user focused
- Let’s see a demonstration



Google Scholar

- Different to google search
  - https://scholar.google.com/
- Will give a broader set of results, not just focused on computing
- Allow you to look up authors as well as papers
  - Handy if you find a key authority in your field you want to look into in more detail
- Good for tracking citations/impact of work
- Let's see a demonstration

Reading Papers

- You cannot fully read of the papers you identify as potentially interesting and related to your project
- Read the abstracts
  - Try and extract what was done, why and what was found. A good abstract will contain all of this
  - After reading the abstract if it doesn't seem relevant, bin it
  - If It is relevant add it to an 'annotated bibliography'
    - A list of references with a few short sentences summarising the paper (what done, why, what found)
    - Your literature review should NOT read like an annotated bibliography with the references stripped out

Proof…

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- I often see students say things like “it has been proven that…”
  - And then go on to cite a user study that supports a particular hypothesis
- Research very rarely ‘proves’ anything
  - Not even in Physics
  - Maybe in Maths
- Research may ‘suggest’ or ‘indicate’
- Research may ‘support’ a particular hypothesis
- You may find pieces of research that suggest conflicting things
  - This can be good as part of a lit review for an analytical discuss

If I run a research study with 50 participants that indicates game development students can move to and click targets on a screen faster and with less error rates than a control sample of computing students not on the games course. Have I ‘proven’ games students are better at using a mouse than non-games students?

References

- Do I need to list references for my deliverables?
  - Yes, put them all in the ‘references’ section of the report template
  - You will add to it over subsequent deliverables
- How many references do I need?
  - How long is a piece of string? The number and type of references for each project will vary.
  - Defer to your supervisor for advice on this (they will be marking the work) but don’t expect them to give you a hard number
  - To get some general ideas check out existing literature reviews
    - There will likely be a short literature review in most good academic conference papers/journals you look at

A proposed lit review process

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- Gather papers related to your problem domain
- Filter papers for relevance to your project
- Identify patterns/themes in the remaining literature
- Use the patterns/themes to form the structure of your narrative
  - Your narrative is what you want to say about the papers
  - Don’t just describe them, say something about them
  - What are the strengths and weaknesses of the existing state of the art?
  - What are the under explored areas?
  - Relate back to your problem statement and project aims
- Look at the background and related work sections in papers for concrete examples of what literature reviews related to your problem domain can look like

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Methodology

Methodology

- This should outline a high level plan for how you are going to address the problem.
  - It may be informed by the methodologies identified in the ‘State of the Art’ section and should outline how your methodology is going help achieve all the objectives outlined in pursuit of the main aim presented in your introduction.
- You should discuss how you will progress through the objectives and how you will know when they have been completed.
- You should also outline your intended process for evaluation at this point (to check whether or not you have addressed the projects overall aim).
- Finally you should provide an expanded indication on how you plan to use your remaining time/resources on the project.

Methodology

- Outline a detailed plan for how you are going to progress through the objectives you stated in your introduction
- You should think of your project as a piece of research
  - Even if it is developing an app, or configuring a network
- You project will require research to…
  - Understand the problem domain
  - Identify and scope a potential solution that sits within the problem domain
  - Identify technologies and potential designs for your solution
  - Test your solution against a set of pre-defined requirements
  - Evaluate your solution against your original aims and objectives

Research Methodology

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Approach your methodology section with a research focused mindset

All development projects are experiments

You are producing an artefact to solve a problem

You are investigating how well your artefact solves the problem

You are not just discussing your development methodology, but also how you are going to meet each of your objectives? how will you evaluate? How will you know whether your project has been a success?

Development Methodology

- The methodology section is not simply the development methodology you will use
  - It will form part of it, it defines the process from requirements to an implemented and tested solution
- Research methodologies have a wider scope than development methodologies
  - They cover the whole context and resolution of the problem
- Many development methodologies you are familiar with are not suitable for your project
  - E.g. Scrum – a team based methodology
- You will build a development methodology that is appropriate for your project
  - Can use features from agile approaches
    - E.g. Kanban, Project/Sprint backlogs, iterative development, etc.

How much should each section be?

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Defer to YOUR supervisor as it will vary between projects and course

- 4000 words approx total

Some courses may have less of a focus on the state of the art and focus more on method

- E.g. Malware Analysis may require detailed methodology if a series of experiments are required
- You can still cite references in the other sections!

As a GENERAL rule, the ‘State of the Art’ section is usually the largest part of this deliverable

- At least 2000 words
  Possibly up to 3000

Summary

- Discussed the next deliverable of your assignment
- Discussed finding and filtering technical literature
- Explored some examples of literature reviews related to computing projects and the writing style used
- Outlined expectations of the methodology section
  - An outline plan for how you are going to solve the stated problem
    - How will you know your solution works as expected
    - How will you know what you expect to work actually works

The End

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