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How to Write a Project Proposal

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Introduction

- What's a project proposal?
- Why do I need one?
- How do I write one?
- Common mistakes, and examples of good practice
- Referencing
- Questions

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What's a project proposal?

- The *Terms of Reference* document
- Sets out an overall plan for your project
- This is not the same as the design of your *product*
- Why do we need one?

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ryezalchaplin.blogspot.com

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chillnite.com

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“Bad planning on your part does not constitute an emergency on my part.”

Trad. proverb.

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You need a plan

- A poorly-planned project stands little chance of success
- Things than can go wrong
  - Running out of time (very common)
  - Bad choice of development methodology/tools
  - Mismatched expectations
  - Reinventing the wheel

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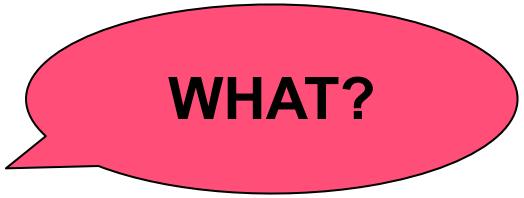
What's in a plan?

1. Context
2. Problem
3. Related work
4. Solution (with desiderata ("desired things"))
5. Aims and objectives
6. Tasks and timetable

What's in a plan?



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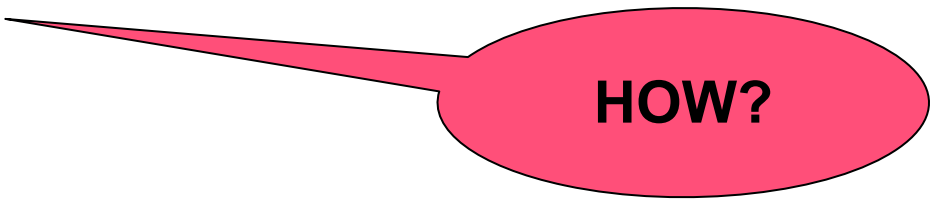

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Context

- Background to your project
- What's the problem?
- Why is it interesting?
- *Set the scene*, lay the foundations
- Common mistake: jump straight in to technical details
- Assume that the reader knows nothing

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Example - context

"Puzzle games are a very common and popular form of entertainment. They require the user to manipulate regions of the game screen in order to obtain particular configurations, such as a filled region (Tetris) or identification of objects (Minesweeper)."

Opening sentence - sets the scene

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Example - context

"Although these games are easy to describe, they are often very complex in terms of the strategies needed to solve them. Because of this, they offer an ideal platform for testing automated solving techniques (the most obvious example being in the game of chess)."

Bridge from background into *your* project

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Example - context

"One example puzzle game is (name of game). This requires the user to (do things) in order to obtain a final board (looking like something) (Gamesoft, 2004). To date, no automated solution techniques have been applied to this game. In my project, I will apply (technique) to the solution of (game).

What are you going to do? Bridge to next section

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Example - context

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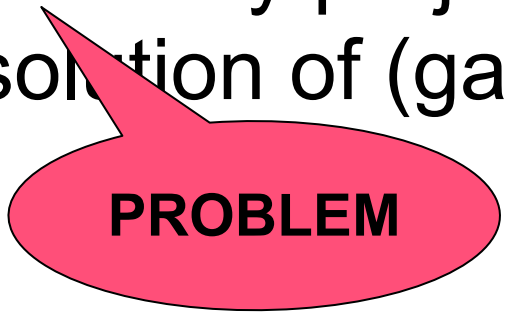

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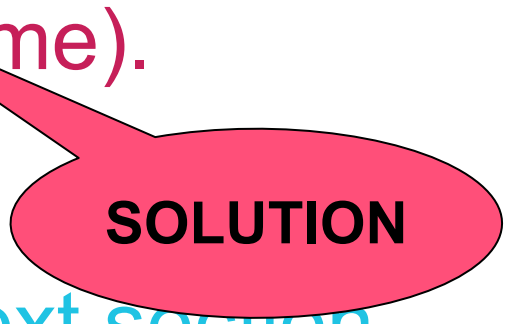

What are you going to do? Bridge to next section

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Related work

- Need to show that you have an understanding of what has *already* been done
  - So you demonstrate a sound grasp of what is involved
  - So that you don't reinvent the wheel
  - So that you acknowledge existing work
- Doesn't have to be *completely* specific to your particular problem, but related

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Example - related work

"Many automated solution techniques have been successfully applied to the solution of puzzle games. These include genetic algorithms (Goldberg 1994; Smith and Wesson, 2006), artificial neural networks (Bandar, 2005) and A-star search (Treeworthy, 2002). For an overall review of how AI-based techniques have been applied to games, see (Jones, 2006)."

Shows you have searched the literature

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Referencing

- Absolutely *vital* - shows awareness of literature, and prevents accusations of plagiarism
- Insert “tag” in the main text, pointing to an entry in the reference list at the end of your document
- “In (Amos and Harding, 2004), the authors show that...”
- Amos, M. and Harding, P. (2004) Agent-based simulation of evacuations. *Fire Safety* 4(1), pp. 43-56.
- Google “Harvard referencing style”

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Solution

- How are you going to solve the problem?
  - What is your approach?
- How will you measure success?
  - What is vital, and what would constitute a “bonus”?
- Who are the stakeholders?
  - Who will participate?
- What is your Plan B?
  - How will you manage risk?

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Approach - example

- “In this project I will test the suitability of the genetic algorithm approach to the solution of the Zen Puzzle Garden. In order to do this, I will first write a Puzzle “engine”. This will then be used to test both genetic algorithm and exhaustive search methods. By running both methods on a large set of example gardens, I hope to obtain a rigourous quantitative analysis of these techniques.”

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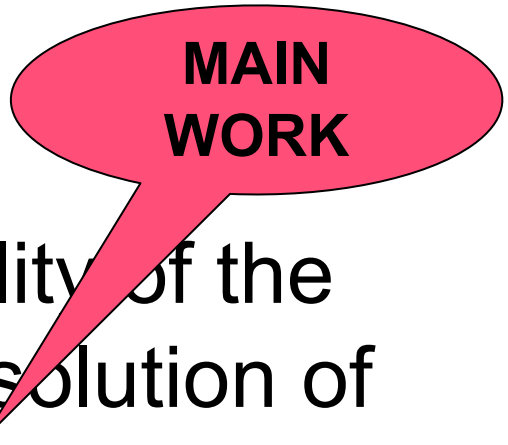

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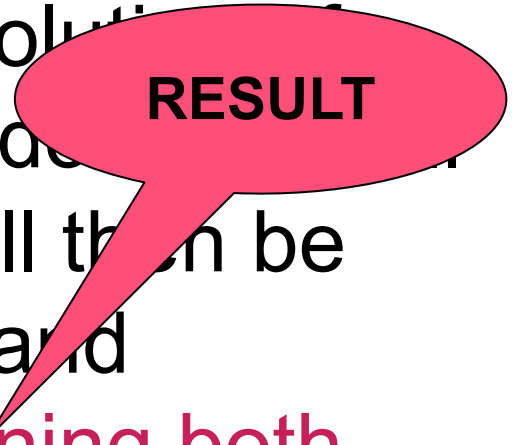

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Success

- Don't set yourself up for failure!
- Define a non-trivial set of functionality for your project
- This is your “baseline”
- Then define additional “bonus” features, which you will implement if time allows

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Stakeholders

- Who else is involved?
- Your supervisor, obviously
- May have industrial partners, customers, etc.
- Important factors
  - Make sure each person's contribution is absolutely clear
  - Make sure your project doesn't rely on anyone else

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Risk management

- Always have a Plan B!
- What happens if, after a few months, your project isn't working out as planned?
- How will you manage this?
  - Try to anticipate possible problems
  - Describe alternatives

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Example - risk management

"I plan to implement this system using a combination of XXX and YYY. However, I have limited experience of YYY, and am unfamiliar with how it might be combined with XXX. As a fallback position, the project may be implemented (with very limited loss of functionality) using ZZZ, with which I am very familiar, and have used successfully before in previous similar projects."

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Aims and objectives

- “Milestones” against which your project is measured
- *Aims* - general statements about what you are trying to achieve
- *Objectives* - more specific description of how the aims will be achieved

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A&O - example

- Aims
  - A1: Gain understanding of AI techniques and games
  - A2: Carry out comparison of different AI techniques when applied to a new game
  - A3: Gain insight into non-trivial project development, management and documentation

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A&O - example

- Objectives
  - O1: Review existing work on AI and games
  - O2: Design and implement game “engine”
  - O3: Implement exhaustive search algorithm
  - O4: Implement Genetic Algorithm,
  - O5: Perform numerical comparisons
  - O6: Document project analysis, design and results
  - O7: Ensure project is managed correctly

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Tasks and timetable

- Important to ensure that you remain on schedule
- Some milestones are fixed (ie. formal reports)
- Others are more flexible
- Project phases may overlap (but not by too much)
- Try to have a significant amount of work done before Christmas

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Tasks and timetable

- Break your project down into *broad phases*
  - Literature review
  - Analysis
  - Design
  - Implementation
  - Testing/user testing
  - Documentation
- Break each phase down into *specific tasks (*start with your objectives, and maybe break these down further into sub-tasks*)*
- Estimate how long each one will take (weeks)
- Draw a GANTT chart to depict this graphically
- Add milestones/deliverables

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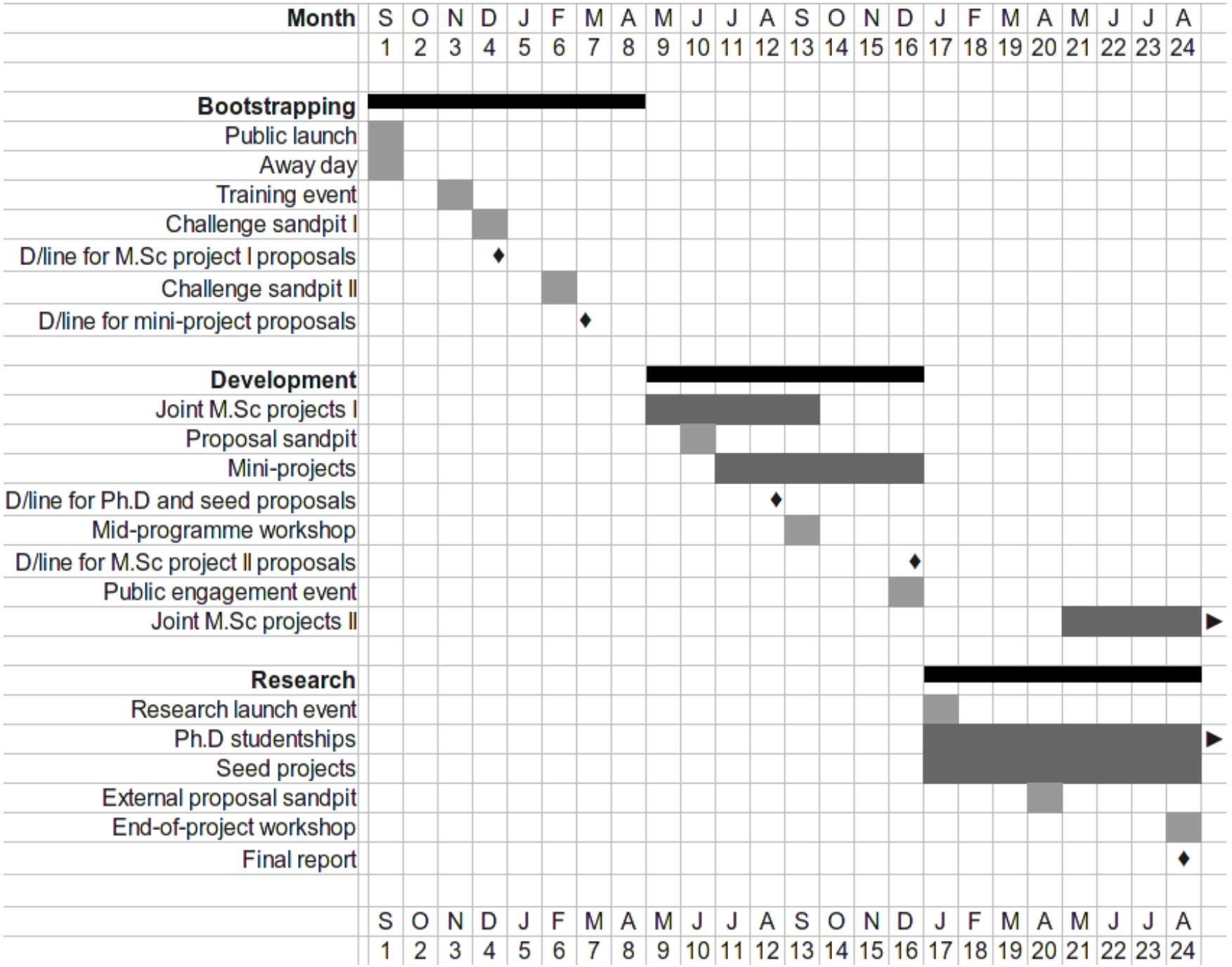

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