Appendix A — The Project Specification

1. Guidelines

You are asked to formulate a proposal for your project in the form of a detailed project specification. This document will identify your research question, the project aims, approach and rationale, expected deliverables and action plan. If you intend to continue with your proposal from Research Principles & Practice you can simply submit that proposal if you are happy that it sufficiently describes your proposed programme of work and a completed ethics form.

You will be required to submit it to your supervisor, together with an ethics check list. The project specification will also act as an indicator when considering the assessment of the project.

2. Content of the project specification

In addition to details about the student and the supervisor a Project Specification document should include the following elements:

Title

The title of the project should reflect the overall aim of the project and the context in which the work is to be carried out. This is seen as a working title and can be changed at later stages in order to reflect potential changes in the project focus and direction.

Research Question

This is the key to a successful Masters project. It should be a simple question which encapsulates the essential nature of your project, which can be stated in your introduction and answered in your conclusions. Here are some examples of types of research question which should produce good results:

> *Is it possible to link database X to a mobile application so that data can be uploaded when it is created?*
>
> *Is it possible to link the computer systems that control a manufacturing plant to the Customer Order System so that stock levels can be automatically updated immediately the new stock is available?*
>
> *Is it technically possible to protect children from **all** undesirable content on the internet?*
>
> *What are the proportions of internet traffic in and out of the University in different categories?*
>
> *Is it possible to provide some intervention that helps patients with an autism diagnosis attend hospital appointments more reliably?*

Please note that these are examples of possible research questions to help you formulate your own. They have not been worked through and are certainly not suggestions or offers.

Elaboration

The aim of the project refers to the focus of the project, often expressed in terms of a generic question and of an intended outcome. It should be made very

explicit and tied in with the project rationale which clarifies why the project is being undertaken. The background should put the project in context. If possible, this section should also set the scope of the project, i.e. what is within the concern of the project and what is outside the study. The section is also likely to contain some references to the literature which are relevant to the work being undertaken.

Project objectives

These should be the things you need to do to collect the information you need to answer your research question. Where there is an intended outcome or outcomes for the project – for example, the development of a specific system, or piece of software or evaluation document - then these should also be stated.

The project objectives constitute the necessary steps to answer the question. As projects vary significantly in scope, nature and focus, the specific objectives for each project will relate to its context. Often, it is possible to organise objectives around learning outcomes for a dissertation. Examples of project objectives include:

- objectives centred around knowledge involving a review of the literature – *e.g. "To identify the key issues relating to …";*
- objectives involving the development of a methodological or analytical framework – e.g., *"to develop an analytical framework to assess critical success factors/best practices/financial implications of …."*
- objectives related to the deployment of investigation techniques, project methods and techniques and the analysis of data – *e.g., "To investigate the current use of …"; "To evaluate and contrast the effectiveness of …"*
- objectives related to intended outcomes and deliverables of the dissertation – e.g., *"To make recommendations for the implementation of…"; "To produce a Flash-based simulation system for..."; "To build a...*".
- objectives organised around a synthesis of findings – *e.g., "To determine and evaluate the implications of …"; "To analyse the learning of …"; "To assess the usefulness of...";*

Etc.

Again, these are examples intended as guidance, rather than a prescriptive formula. Typically, project outlines around three to five objectives, but this will again vary with the nature of the project. They are more detailed than your Research Question and are the stages that you need to complete to provide the evidence necessary to answer it. You do not need to include the standard parts of your dissertation such as background, research methods or conclusions in your objectives. They have to be included in any Masters dissertation.

Project deliverable(s)

This section should describe what deliverables are expected to be developed through the course of the Individual Project module. It should indicate in which way these deliverables are intended to support the research and which of the project's objectives these will relate to**. All MComp projects will be expected to deliver at least one computing based deliverable (does not have to be a piece of software, it could be an algorithm, piece of hardware, a specification, an evaluation or other tangible artefact that is appropriate to your course of study).**

Ethics

A statement indicating that any ethical issues associated to the project have been considered by yourself and your supervisor and that an appropriate course of action will be followed.

Action plan

The keys steps and associated milestones should be detailed in this section. Timescales should be included for each of the steps and completion dates should be proposed for each milestone. These are likely to be approximate … but try to be realistic. The plan should also identify the resources likely to be needed to undertake the project and confirm their availability.

3. Agreement of your Project Specification

Your project specification should be agreed by your supervisor and will be reviewed by a moderation panel. This is to ensure that it represents a project that has the potential to lead to a successful project. This agreement should take place early on in the process and before the specified deadline. You will be provided with formative feedback. A copy of the agreed Project Specification form must be included as Appendix A of your final report.

NOTE: Deadline date for the Project Specification is given in the Project Guide and in the "Key Dates" document on the Blackboard site for the module.

4. Project Specification form

(See page 3.)

Sheffield Hallam University
Faculty of Arts, Computing, Engineering and Sciences (ACES)
Department of Computing

MComp Individual Project: Project Specification

Student name	Ashley Smith	
Student contact details	**SHU Email**	b5010988@my.shu.ac.uk
	Telephone	07743157090
Course *(Delete as appropriate)*	MComp Computer Science for Games	
Supervisor name *(if known)*	Jacob Habgood	
Title of project *(provisional)*	Pathfinding to the right decision: Using AStar as an alternative for decision making in games	
Date	16/10/19	

Please complete all the following sections:

Research Question

How viable is AStar as a decision making algorithm when compared to traditional behaviour trees?

Elaboration

This project aims to investigate further uses for established pathfinding algorithms. Traditionally, algorithms such as A* are about getting from A to B when given some data like a roadmap of a city or a grid of tiles or points for a video game. When implemented, these algorithms will be given this data as a graph of nodes where the edges represent things like distance, maximum speed or the traversal time, all of which are based on moving from one node to the next. In this project, I want to attempt to substitute these types for *any* type in a similar way to how we use algebra to factor out variables. In functional programming, functions themselves can be treated as variables, and so by adopting similar methods we ignore the details about *how* and *why* we are pathfinding and *what with* in order to use A* in other situations.

Project objectives

(the stages you need to complete to answer your research question - including intended outcomes where applicable)

Firstly, create a testing environment consisting of a game which an AI can easily play. implement both A* and Behaviour tree methods as ways of deciding what to do during a turn. Implement a map editor allowing for the creation of different scenarios to analysing. Make the A* algorithm compete against the behaviour tree and observe games for not only ‘correct’ choices but also ‘human’ choices.

Project deliverable(s)

The executable containing the testing environment

Ethics

(any ethical issues you have identified when completing the ethics checklist – submitted separately)

Only myself and AI will play the game.

Action plan

(including task plan, milestone dates and timescales)

September + October:

- Create test harness featuring the strategy game, AI Controllers, Map generation / creation
- Write the behaviour tree with as many similarities to the AStar heuristic function as possible
- Testing of fundamental game mechanics to ensure a fair game

November:

- Implementing and tweaking the test environment to completion to ensure suitability for use in this research
- Collecting papers and references for literature review and methodology discussio
- Begin drafting of paper towards the end of November

December:

- Write literature review
- Write method and methodology
- Analyse and evaluate research
- Finish paper
- Proof read and get it checked by peers for readbility