

INDIVIDUAL SPECIALIST COMPUTING PROJECT - TECHNICAL REPORT

Version 0.1
Computing
COMP2**

Dr Michael Scott

Introduction

For this assignment, you will create and present both a poster and web page in which you report the outcome of practice-based research related to the technical architecture of your individual specialist computing project.

Whether you are going to apply for a role in the industry or for a role further afield, employers will want to know what you can do and what value will you bring to their company. People care more about concrete practical examples of your work experience and your skills, and so it is important to develop a comfort with demonstrating and discussing technical projects. Hence, this 'technical report' assignment is framed around how you communicate a potential portfolio piece to an employer.

There are **TWO** key learning outcomes which you need to address in your technical report. These are:

- LO3. **Integrate** appropriate data structures and interoperating components into software, with reference to their merits and flaws.
- LO5. **Develop** an argument on a topic using appropriate research methods, primary and secondary sources, and academic conventions.

As such, there needs to be an element of reflection in your technical report where you analyse the advantages and disadvantages of the shape of your computing artefact. There also needs to be an element of research in which you develop an *argument* which you support through appropriate methods. By argument, we mean "an evidence-based defense of a non-obvious position on a complex issue". This is **not** a traditional academic essay, and so please do not take a formal approach and do not restrict yourself to academic sources. Though you need to follow academic conventions, it is not a literature review! Citing the grey literature is not only acceptable but is encouraged. The best way of achieving both of these learning outcomes is through a process of practice-based research. This means we anticipate that you conduct "an original investigation in order to gain new knowledge by means of practice and the outcomes of that practice". Typically, tinkering with your artefact, experimenting with ways of doing things, and comparing outcomes to see what is effective.

This assignment is directly linked to the 'computing artefact' assignment in the specialist module that you have selected. Accordingly, the assignment is formed of these parts:

- (A) **Prepare** a brief proposal which will:
 - (i) **outline** the computing artefact you intend to create;
 - (ii) **align** the computing artefact with the specialism you have chosen and its structure of worksheet activities;
 - (iii) **identify** the broader context and potential application of your computing artefact;
 - (iv) **describe** the work required;
 - (v) and **justify** that the computing artefact is feasible in scope.

"A good portfolio is essential for getting your first role in the games industry, and not just for artists! You will be expected to show examples of your work when applying for roles at a games studio, whether you're a game artist, programmer, designer, or any other dev role!"

— Aardvark Swift



Poster demonstrations are a common way of presenting computing projects and will help you to develop communication skills which are useful in interview contexts, especially when showcasing your portfolio work to potential employers.

- (B) **Implement** a draft of your computing artefact, ensuring that you:
- (i) **refer** to the assignment brief that details requirements for your specific module (i.e., choice of specialism);
 - (ii) and **conduct** some form of practice-based research as you implement the artefact, which you could report on.
- (C) **Prepare** a poster that will:
- (i) **describe** your computing artefact;
 - (ii) **illustrate** the architecture of your computing artefact;
 - (iii) and **justify** key development choices and design decisions.
- (D) **Present**, as an individual, the poster:
- (i) **articulating** your key design decisions **and** approaches to developing your computing artefact;
 - (ii) **analysing** the merits and flaws of these decisions and approaches;
 - (iii) as well as **explaining** your practice-based research.
- (E) **Prepare** a report as a web page that will:
- (i) **describe** your computing artefact;
 - (ii) **illustrate** the architecture of your computing artefact;
 - (iii) **embed** a video of your computing artefact;
 - (iv) **communicate** your practice-based research;
 - (v) and **defend** an argument related to the outcome of this research.
- (F) **Present**, as an individual, the web page to your tutor, ensuring that you:
- (i) **demonstrate** your academic integrity;
 - (ii) as well as **showcase** your knowledge of system architecture/research.

You should discuss what constitutes appropriate practice-based research with your specialist tutor. An example of practice-based research that you could report on is comparing different solutions and techniques. See:

<https://snowhydra.wordpress.com/2015/06/01/unity-performance-testing-getcomponents-tags/>

https://www.gamasutra.com/blogs/JakobRasmussen/20160427/271188/Are_Behavior_Trees_a_Thing_of_the_Past.php

This will vary by area of specialism. You will meet with your tutor every two weeks to support this aspect of your individual specialist project.

Assignment Setup

This assignment is a **reporting** task. There is no template repository for this assignment; create a new repository for your work. It should contain source to produce a **.pdf** for your poster and **.html** documents for your web page; eventually to submit together as a single **.zip**. Remember to modify the **.gitignore**.

Part A

Part A consists of a **single formative submission**. This work is **individual** and will be assessed on a **threshold** basis. Answer the following questions to pass:

- What is the high concept of your computing artefact?
- What functionality will your component include?
- How does your component fit into your chosen specialism?
- Why is this artefact needed?
- What are the key requirements?
- Is the scope appropriate for the product development time-frame?
- How will you address the architect and research requirement?

To complete Part A, prepare the handout using any word processing tool. Your handout may include images and/or links to online videos.

Show the handout to the **tutor** in the timetabled proposal review session in Week 2 for immediate **informal feedback**.

Part B

Part B is a **single formative submission**. This work is **individual** and will be assessed on a **threshold** basis. The following criteria are used to determine a pass or fail:

- (a) Submission is timely;
- (b) The computing artefact fits within the scope of the chosen specialism;
- (c) The computing artefact is appropriate according to the constraints in the assignment brief for the chosen specialism;
- (d) There is sufficient original computing content to be developed to deliver proposed computing artefact (i.e., it is non-trivial);
- (e) The proposed computing artefact can serve as a platform for practice-based research;
- (f) Enough work is available to conduct a meaningful review.

To complete Part B, prepare a draft version of your computing component. Ensure that you refer to the specific assignment brief for your choice of module. Bring the artefact to the supervision session in Week 4 and the mid-term review session in Week 6. Ensure that you use version control for your work, but in the event of connectivity problems, a backup on a USB storage device is advisable.

Include a `readme.md` file detailing which parts of the project constitute your component for this assignment.

You will receive immediate **informal feedback** from your **tutor**.

Part C

Part C is a **single formative submission**. This work is **individual** and will be assessed on a **threshold** basis. The following criteria are used to determine a pass or fail:

- (a) Submission is timely;
- (b) The poster follows the required template (i.e., is a portrait A3 document with all specified sections);
- (c) There is identifying information on the poster (i.e., your name and the project title);
- (d) There is at least one UML diagram;
- (e) The poster clearly illustrates the key system components, patterns, and/or data structures;
- (f) Enough work is available to conduct a meaningful review.

To complete Part C, produce an A3 portrait poster. You may use any software to prepare the poster, but you should follow the layout in the provided **Power-point** template. Bring the digital version of the poster to the supervision session in Week 8.

You will receive immediate **informal feedback** from your **tutor**.

Part D

Part D is a **single summative submission**. This work is **individual** and will be assessed on a **criterion-referenced** basis. Please refer to the marking rubric at the end of this document for further detail.

Update the poster based on the feedback that you received in Part C. Then, print the poster on white A3 paper. Bring a physical copy of the poster to the poster demonstration session scheduled in Week 8.

You will receive immediate **informal feedback** from your **tutor**.

Part E

Part E is a **single formative submission**. This work is **individual** and will be assessed on a **threshold** basis. The following criteria are used to determine a pass or fail:

- (a) Submission is timely;
- (b) The web page is suitable for submission in .html format (i.e., custom source, or using a tool like SiteSucker);
- (c) Enough work is available to conduct a meaningful review.

To complete Part E, produce a web page containing your report. You may use any framework to prepare the website, for example WordPress, but you should follow the layout suggested in the portfolio development workshop sessions. It is likely that the technical report represents part of the portfolio website that you have created. Bring the digital version of the website to the peer review session in Week 9 and the supervision session in Week 10.

You will receive immediate **informal feedback** from your **tutor**.

Part F

Part F is a **single summative submission**. This work is **individual** and will be assessed on a **criterion-referenced** basis. Please refer to the marking rubric at the end of this document for further detail.

Update the website based on the feedback that you received in Part E. Upload to LearningSpace by the time/date specified in the list of deadlines available on myfalmouth.falmouth.ac.uk (typically, shortly following the supervision meetings in Week 10) and ensure that you include your website, poster in your submission to the 'technical report' submission queue. Please note that you should upload the video of your artefact to the appropriate submission queue for the 'computing artefact' assignment.

Then, attend the timetabled viva session.

You will receive **formal feedback** from your **tutor** three weeks after the viva.

Additional Guidance

It is important to keep up with the formative deadlines as receiving and then acting on the feedback will not only enable you to achieve a high grade, it will enable you to make a better project.

When it comes to the poster, you should endeavour to limit the amount of text, you always should favour images over text. If you use text, please ensure the font size is legible on the printed out poster.

FAQ

- **What is the deadline for this assignment?**

Falmouth University policy states that deadlines must only be specified on the MyFalmouth system.

- **What should I do to seek help?**

You can email your tutor for informal clarifications. For informal feedback, make a pull request on BitBucket.

- **Is this a mistake?**

If you have discovered an issue with the brief itself, the source files are available at:

<https://github.com/Falmouth-Games-Academy/bsc-assignment-briefs>.

Please make a pull request and comment accordingly.

Table 1: Indicative Assignment Timeline

Week 2	•	Show Proposal to Supervisor (Part A).
Week 4	•	Show Computing Artefact Work-in-Progress to Supervisor (Part B).
Week 6	•	Show Computing Artefact Work-in-Progress to Supervisor (Part B).
Week 8	•	Show Draft Poster to Supervisor (Part C).
Week 8	•	Present Poster to Peers (Part D).
Week 9	•	Peer Review Web Page (Part E).
Week 10	•	Show Web Page to Supervisor (Part E).
Week 10	•	Submit Poster and Web Page to LearningSpace (Part F).
Week 13	•	Present Web Page at Viva (Part F).

Marking Rubric

This rubric applies to the assessment of the **poster** in Part D.

Criterion	Weight	Refer for Resubmission	Adequate	Competent	Very Good	Excellent	Outstanding
Completion of Poster	15%	At least one part is missing or is unsatisfactory.	Submission is timely and satisfactory. Enough work is available to hold a meaningful discussion. No breaches of academic integrity. The student demonstrates adequate research and information skills. The student demonstrates adequate ability to critically engage with and analyse information and formulate reasoned arguments.				
ARCHITECT: Description of Software Architecture	10%	No description of the software architecture No attempt to describe the design of the software.	Little insight into the software architecture. There is a description of the key classes but no insight into the data structures or design patterns used.	Some insight into the software architecture. There is a description of the key classes. The data structures and design patterns have been described with no context	Much insight into the software architecture. There is a description of the key classes with reference to their functionality. The data structures and design patterns have been described with context to their application.	Considerable insight into the software architecture. There is a description of the key classes with reference to their functionality. The data structures and design patterns have been described with context to their application. There is some justification for the selection of data structures and design patterns.	Significant insight into the software architecture. There is significant evidence of software design There is synergy between data structure and design pattern selection. The selection of data structures and design patterns are well justified.
ARCHITECT: UML Diagram	15%	No UML Diagrams.	UML Diagrams are incomplete. Non-standard UML notation has been used. Incorrect use of diagram type.	UML Diagrams are mostly complete. The UML notation are mostly correct.	UML Diagrams are appropriate. The choice of diagrams are appropriate. There are only minor issues with the notation.	UML Diagrams are directly linked to the software architecture. There are only minor errors in the diagrams.	UML Diagrams are of a professional standard. All notation is correct. There are no errors in the diagrams.
RESEARCH: Context for Practice-Based Research	10%	No proposed context for doing practice-based research.	The proposed context for doing practice-based research is broadly appropriate.	The proposed context for doing practice-based research is appropriate. The proposed research context strives to go beyond analysis of the artefact.	The proposed context for doing practice-based research is appropriate, and leverages the computing artefact well. The proposed research context strives to go beyond analysis of the computing artefact and/or benchmarking.	The proposed context for doing practice-based research is sound, and is well suited to the computing artefact being developed. The proposed research context is somewhat ambitious.	The proposed context for doing practice-based research is sound, and the computing artefact being developed served as an ideal platform for its timely completion. The proposed research context is ambitious.

Marking Rubric

This rubric applies to the assessment of the **web page** in Part F.

Criterion	Weight	Refer for Resubmission	Adequate	Competent	Very Good	Excellent	Outstanding
Completion of Web Page	15%	At least one part is missing or is unsatisfactory.	Submission of all parts is timely and satisfactory. Enough work is available to hold a meaningful discussion. No breaches of academic integrity. The student demonstrates adequate research and information skills. The student demonstrates adequate ability to critically engage with and analyse information and formulate reasoned arguments.				
ARCHITECT: Reflection on Computing Artefact	10%	There is no reflection on the merits and flaws of the use of different data structures and interoperating system components in the computing artefact.	There is limited reflection on the merits and flaws of data structures, patterns, and interoperating components. No depth of consideration.	There is a general, broad, and high-level reflection on the merits and flaws of different data structures, patterns, and/or interoperating system components. Some depth of consideration, demonstrating a little analysis. Little to no generalisation to a significant wider issue.	There is a focused reflection on the merits and flaws of the use of different data structures, patterns, and/or interoperating system components applied to the design of the computing artefact. Much depth of consideration, demonstrating some critical thinking and analytical skills. Allusions to significant issues of interest to other developers, suggesting the findings can be generalised.	There is a narrow and focused reflection on the merits and flaws of the use of different data structures, patterns, and interoperating system components applied to the design of the computing artefact. Considerable depth of reflection, demonstrating critical thinking and evaluation. Links are made to significant issues of interest to other developers, showing how findings can be generalised.	There is a very narrow and highly pertinent reflection on the merits and flaws of the use of different data structures, patterns, and interoperating system components applied to the design of the computing artefact, motivated by wider issues in the field. Significant depth of reflection, demonstrating strong critical thinking and evaluation. Clear links are made to significant issues of interest to other developers, showing how findings can be broadly generalised.
RESEARCH: Defense of Argument	10%	There is no argument, or it is not defended.	A claim is made on an issue. There is a little evidence to support the argument.	There is a defense of a non-obvious position on an issue, deriving from the practice. There is some evidence to support the argument.	There is a defense of a non-obvious position on a complex issue, deriving from practice. There is much evidence to support the argument.	There is a strong defense of a non-obvious position on a complex issue, deriving from practice-based research. There is much evidence to support the argument, and it is convincing.	There is a very strong defense of a non-obvious position on a complex issue, deriving from practice-based research. There is much evidence to support the argument, and it is very convincing.
RESEARCH: Appropriateness of Practice-Based Research Methods	10%	There is no practice-based research.	The work implies the application of practice-based research methods, but they are not articulated with sufficient clarity.	The work somewhat describes the application of practice-based research methods. The choice of methods is broadly appropriate.	The work describes the application of several practice-based research methods with clarity. The choice of methods is appropriate. There is a combination of primary and secondary methods.	The work reflects upon the application of several practice-based research methods. The choice of methods is appropriate and has some justification. There is a combination of primary and secondary methods.	The work critically reflects upon the application of several practice-based research methods The choice of methods is appropriate and has much justification. There is a combination of primary and secondary methods.

Criterion	Weight	Refer for Resubmission	Adequate	Competent	Very Good	Excellent	Outstanding
RESEARCH: Application of Academic Conventions	5%	No evidence for partial-mastery of academic conventions. The reference section is missing. There is no structure.	Some evidence for partial-mastery of academic conventions. There is a little structure. A few sentences and paragraphs are well constructed. The reference section is incomplete and/or malformed.	Much evidence for partial-mastery of academic conventions. There is some structure. Some sentences and paragraphs are well constructed. Most in-text citations and quotations are correct. The reference section is complete and mostly well-formed in Harvard, ACM or IEEE format.	Some evidence for mastery of academic conventions. There is much structure, highlighting the argument. Most sentences and paragraphs are well constructed, clearly articulating points in the argument. All in-text citations and quotations are correct. The reference section is complete and entirely well-formed in Harvard, ACM or IEEE format.	Much evidence for mastery of academic conventions. There is considerable structure, bolstering the argument. Most sentences and paragraphs are well constructed, clearly articulating and signposting points in the argument. All in-text citations and quotations are correct. The reference section is complete and entirely well-formed in Harvard, ACM or IEEE format.	Considerable evidence for mastery of academic conventions. There is significant structure, supporting the logical flow of the argument. Nearly all sentences and paragraphs are well constructed, emphasising points in the argument. All in-text citations and quotations are correct. The reference section is complete and entirely well-formed in Harvard, ACM or IEEE format.