Creative Computing II: interactive multimedia
Coursework assignments 2016–17

Introduction

The following coursework assignments are an opportunity for you to obtain a broader and deeper understanding of some of the material in this unit.

You may wish to use the creative work from your assignments as the basis for developing an item in your Portfolio; see the appropriate sections of the subject guide and the 'Portfolio creation' booklet for details.

Academic approach to discussion questions

You are expected to approach the courseworks in this unit in a rigorous and academic way. While it is fine to use Internet search tools and Wikipedia to obtain a broad understanding of a topic, it is also essential that you use reliable academic references to obtain your information.

In any essay that you write, you must make sure that you use and cite your reference material appropriately. You can look at the end of any journal or conference paper to get an idea of how to do this.

We also expect you to approach the work in an informed and critical manner, and to develop an ability to form views based on evidence (substantiating any strong claims you may make), and to argue in support of your claims.

If you make use of any code that you have not written yourself—whether you use it as is, or make modifications to it—it is essential that you acknowledge this properly. Likewise, you are free to use material from Creative Commons, but you must respect and adhere to any licensing information that is associated with the material.

Submission

Completed coursework assignments are to be uploaded to the VLE for submission. In general:

- ► essays and discussions must be in the form of a PDF;

- ► any *Processing* sketches should be in a ready-to-run form (which may mean that you have to submit them as a zip file containing an appropriate Data folder); and

- ► it is essential that you comment any code that you submit.

Creative Computing CO2227 Coursework assignment 1: 2016–17

Both of the coursework assignments this year involve practical implementation of algorithms that you have seen in the subject guides, followed by creative development inspired by this.

Distance metrics

Your task for this coursework assignment is to explore distance metrics, and in particular their use in music information systems.

Your submissions will be assessed for how successfully they fulfil their briefs, the technical content of the sketches, the clarity of your written descriptions, and any added value. We also continue to develop your ability to critically evaluate your own and others' work.

A. There is mention in Volume 2 of the CO2227 subject guide of the Levenshtein algorithm for determining the edit distance between two strings. For this part of the assignment, you are to present a description and discussion of the Levenshtein algorithm that includes variations (one example is the Levenshtein-Damerau algorithm) and applications. You're encouraged to look at a broad range of applications, but you should make sure you include in particular the application to music.

Your discussion should be up to 1,000 words long, and you need to pay attention to academic writing, making sure you cite and reference correctly. Note that a shorter essay will not obtain lower marks, if it includes all that is required; content is more important than length.

Submission is to be a .pdf file, called *YourNameYourSRN*PartA.*pdf* (for example, the file could be called `JoBloggs10923467PartA.pdf`). [20%]

B. Develop a *Processing* sketch that implements the Levenshtein distance algorithm, or an appropriate variation, that is able to determine the distance between pairs of strings. Make sure that you are able to (reasonably) flexibly enter different strings for comparison; this may be via keyboard, mouse, or file input, but you should justify your choice.

The ultimate application of this implementation is to be able to decide whether a string that is input is close enough to a name of a city or town in the country that you live in. So, for example, the user of your sketch should be able to enter "Londen" and this should be seen as a valid city, whereas "Loonon" probably won't be (and "Undern" certainly shouldn't be).

You should include with your submission a discussion of the approach you've used in implementing the algorithm, and your view on the accuracy and reliability of your approach. If the algorithm is weak in certain aspects, discuss this also.

Submission should be in a `zip` or `rar` file containing appropriately named files, to be called *YourNameYourSRN*PartB.*ext*. The *ext* would depend on what kind of compression you used. You should have a folder for the *Processing* artefact, and a separate `.pdf` file for the written discussion.   [25%]

C. Develop an interactive sketch that is inspired by the work you did in Part B. You should focus on the creative aspects, and make use of the material in Chapter 7 'Introduction to Creative Thinking' and Appendix A 'Creative Brief' of Volume 2 of the CO1112 Creative computing 1 subject guide, which discusses creative thinking. Be very clear in your written report for this section exactly what it is you are trying to demonstrate or achieve.

As your submission to this part, include your *Processing* sketch code, and any source materials along with origin and attribution. It should be easy for examiners to run your sketch, so you need to make sure you include everything required for them to do so. Instructions on how to use the sketch should be included here if appropriate, as part of the written submission for this section (see following paragraph).

Accompanying your code submission, in .pdf, you should submit a description of the aspects of distance metrics that you've focused on. Under a separate heading, include a description of your design decisions, any aesthetic considerations you made, and a critique of your work, which looks at the effectiveness of what you have achieved, as well as the technical hurdles you may have encountered while doing so. This should be up to 1,000 words, although you may be able to do it in a much more concise document. You won't be penalised for a shorter document, nor will you get higher marks for one that is close to 1,000 words. What is important is the quality and incisiveness of your description and critique.

Submission should be in a `zip` or `rar` file containing appropriately named files, to be called *YourNameYourSRN*PartC.*ext*. You should have a folder for the *Processing* artefact, and a separate file for the .pdf discussion. It is important that the *Processing* sketch works directly, so make sure any relevant data files are also included in the appropriate folder.   [40%]

D. Take a look at the paper by Keith Orpen and David Huron, given below. It's an early paper looking at the use of the Levenshtein distance in measuring similarity in music. You don't need to examine every bit of this paper in great detail, but you should obtain an overview of what the main threads are.

Using this, and any other research since then, comment on the relevance of this work to music recommender systems. We are looking for your own views and insights, justified and supported by the reading you've done. This should take the form of a short essay, using appropriate academic writing, of at most 500 words, submitted as a PDF.

> Orpen, K. & D. Huron (1992). 'The measurement of similarity in music: a quantitative approach for non-parametric representations', *Computers in Music Research*, Vol. 4, pp. 1–44.

Your response is to be submitted in a file called *YourNameYourSRN*PartD.pdf.   [13%]

E. Identify a fellow student who is also completing a submission for CO2227 Coursework assignment 1. Please arrange to swap with the student their whole submission, **after** the deadline for submission has passed. You will need their submission in order to complete your next coursework assignment.

Submit, in a file called *YourNameYourSRN*PartE.pdf, the name and student number of the student with whom you will be swapping work, and a brief sentence about how you know this student. Students at teaching institutions may choose a classmate, but this is not compulsory and any student taking the course this year is permissible. For students studying independently, the VLE is your best bet for finding a student to partner with on this part of the coursework assignment.

Although this part is worth a very small number of marks, it is compulsory as if you do not complete this part, you will not be able to do Coursework assignment 2.   [2%]

[Total 100%]

For Coursework assignment 1, you are required to submit a single .zip or .rar file, that contains five files — one for each part of the coursework assignment. This will consist of pdf files for parts A, D and E, and a compressed folder for each of parts B and C. Each of the two folders should contain the relevant *Processing* sketch, everything needed in order to run it, and the documentation or reports specified in the brief.

[END OF COURSEWORK ASSIGNMENT 1]

Creative Computing CO2227 Coursework assignment 2: 2016–17

Inbetweening

In Volume 2, Chapter 4, of the subject guide, there is material on the use of interpolation and other techniques to achieve some of the requirements of tweening in animation. For this coursework assignment, you are to read in more depth about algorithmic approaches in tweening, and to compare some of these approaches. You will also be required to critically evaluate your own work, and the work of a fellow student.

A. In the previous coursework assignment, you were required to present an essay about the Levenshtein distance, and develop two artefacts — one implementing the edit distance in a particular context, and one a creative artefact inspired by this. As part of your work on the second implementation, you were required to provide a critique of the effectiveness of the artefact. Finally, you were required to provide a short comment essay about the relevance of distance metrics in music information retrieval IR).

Using the work (essay, artefacts and accompanying report/s) that you obtained from a fellow student, you should now perform your own critique of their work. You should now obtain or already have obtained the submission, and you are required to critique each of the first four parts — the essay, the initial implementation, the creative artefact, and the comment on relevance to music IR. Put most of your effort into your critique of the artefact (and the student's own critique of that), but also comment on the essays and development from Parts A, B and D.

Remember that critique does not mean simply finding fault; in order to properly critique something, you need to understand the broad area (which you should, from having done the background reading for your own coursework assignment) and you need to evaluate the strengths and weaknesses of the work in that context. Most importantly, you should try to determine whether the artefact is effective — that is, whether it achieves its aim.

Please submit your critique or evaluation as a PDF, named *YourNameYourSRN*PartA.pdf. Make sure you clearly identify, again, the name of the student whose work you are critiquing; if you need to change this from the one you identified in your submission for Coursework assignment 1, you must get in touch with us through the VLE to explain the reasons for the change. At the end of the critique, you should include a general grade, that you would award to the work. Do this for each of the four sections, and then for the submission overall. Please note that the grades you award will have no effect on the grade that your fellow student is awarded by the University of London examiners; this is simply for you to give us an indication of how you rate this work.   [20%]

B. Describe what tweening, or inbetweening, in animation is, and present a brief discussion of some of the issues of tweening in animation.

Your discussion should mention the role of algorithmic approaches, and also discuss digital animation and automatic animation in contrast with hand-drawn animation. As in previous essays and discussions, proper academic writing is required. Your submission is to be in a PDF file called *YourNameYourSRN*PartB.pdf   [15%]

C. In *Processing*, write three sketches that allow the user to click on points on a screen. The time and position of each click should be stored as an array of keyframes. When the user presses *Return*, the stored movements are replayed with a dot moving smoothly between the points.

Perform the inbetweening using a variety of techniques (linear interpolation, Catmull-Rom splines, Bézier curves are some that are presented in the subject guide, but there are others) and evaluate the results. Use three different techniques to demonstrate different aspects, but bear in mind that the quality of your evaluation is as important as your implementation.

You should describe explicitly how you are performing the evaluation (i.e. what your evaluation criteria are, how you are measuring these, etc.), and you should compare and contrast the different techniques.

For this part, submit a compressed file, containing three folders (one for each sketch) and a PDF file for your report. The overall file is to be called *YourNameYourSRN*PartC.*ext*. Either `zip` or `rar` compression is acceptable.

[30%]

D. Choose the most appropriate approach from what you have developed in part C and develop this sketch further into a creative animation. Discuss your motivation and design decisions, and provide an evaluation of the impact and success of your work.

For this part, submit a compressed file, containing one folder for the sketch (including all data and running instructions) and a PDF file for your report. The overall file is to be called *YourNameYourSRN*PartD.*ext*. Either `zip` or `rar` compression is acceptable.   [35%]

For coursework assignment 2, you are required to upload a single .zip or .rar file, that contains four files – one for each part of the coursework assignment. This will consist of pdf files for parts A and B, and a compressed folder for each of parts C and D.

[Total 100%]

[END OF COURSEWORK ASSIGNMENT 2]