GWAP Project Specification (Project 2)

Barry Smyth, February 22nd, 2016

COMP 30490/41440

This project specification is for students taking COMP 30490/41440 Collective Intelligence. It is a compulsory project for all students.

The project has a final completion date of April 29th 2016 but there are intermediate checkpoint submissions, which will be graded.

All project submissions will be via Moodle. This project carries 50 marks for 5-credit COMP 30490 students and 150 marks for 10-credit COMP 41440 students.

What follows describes the detailed project specification with a breakdown of what is required, timings, grading information etc. Please read it carefully so that you may fully understand what is needed.

Aims & Objectives

The aim of the project is to design a game-with-a-purpose in the style of those discussed during lectures. The form and function of the GWAP, and the target problem you wish to solve, is entirely up to you. You must ensure however that the design borrows from the sort of gaming ideas found in GWAPs for the solution of some greater challenge using a Collective Intelligence methodology.

Project Components

All students should complete the following project components:

1. ***Project Proposal Document*** – An outline of your proposed GWAP including sufficient detail on the problem being solved, the approach to be taken, and the proposed GWAP itself. This proposal needs to enable the demonstrators to evaluate how well the proposed GWAP is likely to meet the requirements of this assignment. You should expect direct feedback from the demonstrators on this proposal document shortly after submission. For most, this feedback will be to indicate that the proposal is appropriate to move forward. However, some may need to make changes to their planned GWAP if the proposal is lacking in some respects.
2. ***A Final Project Report*** – A comprehensive final report describing all aspects of the finished project, from motivating the problem to be solved to a detailed technical description of the proposed solution in the form of a GWAP.
3. ***GWAP Mockup / Implementation*** – The requirements of this component differ based on whether you are taking the 5- or 10-credit module.
    a. ***COMP 30490*** *(5*-credit) – Provide a design prototype in the form of a mockup and annotated screencast; options for how you might do this will be discussed later.
    b. ***COMP 41440*** *(10*-credit) – A working implementation that can be "played" as a GWAP; this should be accompanied by a short narrated/annotated screencast or video of the game in action (see later).

A Word on Novelty

There are few if any restrictions on what you might develop as a GWAP as long as it reasonably conforms to a GWAP and solves a sensible problem in a reasonable way.

Your project does not have to be particularly novel but nor should it simply reproduce an existing system verbatim. For example, you might decide to address an existing GWAP problem but using a different gameplay approach; this is fine. Equally you might decide to target a novel problem but borrow ideas from an existing game; this is also fine.

Ultimately it is your decision about how you wish to proceed but you are expected to consider the implications of what you decide to work on. If you make it too challenging then you may not complete enough of the project to demonstrate your idea. If it is too simplistic then it may be difficult to justify it as sufficient.

Workload & Effort

Remember that the 5-credit option corresponds to approximately 40 hours of effort over the remaining 9 weeks (including Study Break), which corresponds to approximately one half-day per week of effort until the end of term. Plan your time carefully.

The 10-credit option will likely need of the order of 130 hours of effort, most of it devoted to implementation (approx. 100 hours). This corresponds to 1.5 – 2 full days of effort per week until the end of term. If you are taking the 10-credit option then this will require some very careful planning indeed to ensure that you do not fall behind.

Project Timetable and Milestones

Project Proposal Document

Due: March 8th 2016, for discussion at labs on March 9th

The purpose of this document should be to provide a clear and concise description of your GWAP proposal, so that it may be verified and validated prior to you moving on to a more detailed design or implementation phase. This proposal may serve as a starting point for your final project report later, although it is likely that there will be significant design decisions and potential changes of direction during the project's implementation.

Above all else your proposal must clearly demonstrate how Collective Intelligence and game mechanics are to be implemented/deployed in your project.

Ordinarily this document should be approximately 3-5 pages in length. A Word template will be provided, which you are required to use and appropriate usage instructions are included in the template itself.

When preparing your proposal you should clearly provide information on a number of key topics, which are headings in the template document.

Motivations & Target Problem (1 page)

Your GWAP needs to target a specific problem that cannot be trivially solved using traditional approaches. In other words it should be a reasonably challenging problem; do not propose a GWAP to sort a list of numbers!

You should carefully describe this problem, argue why it is challenging, and justify why a collective intelligence/GWAP-approach is suitable in delivering a solution.

In particular, you should clearly articulate how your solution will emerge from collective gameplay and consider the availability of suitable data etc. as a practical matter.

Game Description (1 page)

Provide a reasonably detailed description of your proposed "game"; strictly your app might not be a traditional game per se but it should incorporate gaming ideas. Is your game for one or two-players, for example? Does it assume symmetrical or asymmetrical game-play. Describe the basic game-play and the game mechanics that you will use. Why and how will it be fun to play? Why might players wish to play it? How would you attract players?

Nobody is expecting a new Halo or Tomb Raider but your proposal must make sensible use of gaming mechanics. In other words it must demonstrate at least some of the basic game-play elements that are commonly found in computer games: visuals, scoring, game mechanics, etc.

All that being said we will be reasonably flexible in our interpretation of what counts as a GWAP for the purpose of this project. The strong interpretation is to implement a classical computer game type app that will use collective intelligence to solve a problem. This is perfectly fine. A weaker interpretation is that your app will borrow ideas from gaming (gamification) in order to make the app entertaining and fun while applying collective intelligence ideas to solve a problem. This is also fine even though your app might look less game-like.

The important point is that gaming ideas are being used in a natural and intuitive way to make encourage usage by making the app fun and compelling and that the act of using the app (playing the "game") is contributing to some larger problem solving goal or challenge.

Prototyping and/or Implementation Plans (1/2 page)

Provide a brief description of how you plan to proceed from a technical viewpoint. All students should discuss the various architectural components, frameworks, databases, and/or platforms that they might use.

5-credit students should give some indication as to how they plan to proceed in terms of mock-up development, while 10-credit students should discuss their choice of language, packages etc.

Evaluation (1/2 page)

Provide some thoughts on how you might evaluate your GWAP. Note that it is not expected that either 5- or 10-credit students will engage in a detailed evaluation of their GWAP. However your final report should include some detail on how you *would* approach its evaluation (methodology, assessment metrics, subjects and data etc) and this initial proposal document should provide some consideration of this.

Mockup / Prototype or Implementation plus Screencast

Due: April 22th 2016

At submission time you should submit a zip file of your commented code (plus compilation/execution instructions) or prototype along with your screencast.

COMP 41440

COMP 41440 students must submit a working GWAP. Commented code should be submitted along with a README file that describes how to run and use the resulting app.

The GWAP can be implemented in a language of your choice and you may avail of suitable frameworks, libraries, packages etc. that you need to implement your system, as long as these are duly referenced in your final project report. For example, gaming libraries can be used. You do not need to reinvent the wheel!

Obviously this does not extend to code which all but implements your GWAP: it is expected that you will develop the bulk of the code needed to implement your specific GWAP.

COMP 30490

COMP 30490 students should develop a demonstration prototype of their proposed GWAP. It is not envisaged that such a system will be developed in code however and students are encouraged to utilize prototyping tools if they wish.

For example, one approach is to use applications like Photoshop, Sketch or even Powerpoint to implement a series of screenshots to reflect the different aspects of the proposed GWAP. These screenshots can be connected together in a simple point-and-click style demonstration interface. You may wish to mockup a simple browser-based prototype using HTML/CSS or related technologies/tools. Alternatively, you may wish to use some more specialized prototyping tools that are available online. For example, the Marvel App (www.marvelapp.com) is a simple web-based prototyping tool that makes it easy to design visual prototypes with limited point-and-click functionality for desktop or mobile devices.

What is important here is that you create some sense of what your GWAP might look like if implemented. It doesn't have to be interactive in any strong sense but it should provide, at the very least, a "storyboard" for your GWAP.

Annotated Screencast

All students should submit a short (1-5 mins) annotated (text or audio is fine) screencast of their app in operation. This will serve as a 'safety net' in case there are issues with running your code but also provides an opportunity to showcase your app in a sandboxed environment. There are many free screencasting tools that will allow you to effectively take a video of what is on your screen. Once again this does not have to be polished. It should simply cover the basics of your game in action or your storyboard in motion. It is your opportunity to remotely demonstrate your game during grading.

Final Project Report

Due: April 29th 2016

The final project report must include a comprehensive account of you final project submission; approximately 10-15 pages. A report template will be provided and suggested section headings include:

Introduction (1 Page)

This should be a brief introduction to your project and an overview of the final report document.

Motivations & Target Problem (2 Pages)

As per your project proposal document you should motivate your choice of target problem and GWAP. This section may be based largely that provided in your project proposal document or you may wish to adapt or extend it based on what you have learned.

Related Work (1 Page)

Ideally you should include at least some reference to related work in the area of GWAPs and attempt to situate your own project against this backdrop. For you example, you may consider whether others have attempted to solve similar problems using GWAPs or Collective Intelligence in the past, and how your approach differs.

System Architecture (2-5 Pages)

Describe the technical architecture that underpins your GWAP. This should include a detailed technical architecture diagram with sufficient technical detail for the reader to form a clear understanding as to the key design decisions that you have made. This is about more than your choice of platform or framework: it should clarify the major components of the system, identify any external dependencies, APIs, databases/datasources, and document important control flows.

Note: it is likely that this section of the project report will be closer to 5 pages for 10-Credit students due to the deeper level of technical implementation required.

Game Design & Mechanics (2-4 Pages including screenshots)

In this section you should describe your game including relevant screenshots of the game/mockup; an annotated game walkthrough, in the form of a sequence of screenshots, is a good idea.

The reader should be able to form a view as to how the game would be played and you need to convey the gaming experience and why you believe it will be fun and entertaining.

In particular, you should include information about the different game mechanics that you have incorporated and how these mechanics help to drive the game and incentivize play. Your scoring function may be important here, for

example. Are there particular strategic aspects of gameplay that you wish to highlight? Are there visuals that you need to discuss?

Evaluation (1 Page)

As per the project proposal report you should include some additional detail on how you might evaluate the efficacy of the project. How could you evaluate the quality of the output? How do you guard against players 'gaming' the system or cheating? Again this is likely based on what you provided in your original proposal, although it does not have to be, and in any event it will likely be extended based on what you have learned.

Conclusions and Bibliography (1 Page)

Your conclusions should summarise your project. What did you achieve? What did you fail to achieve, and why? What did you learn? Importantly, how would you prioritise future work? What new aspects or ideas would you like to work on or see others develop?

You should also include a complete bibliography with detailed references and using correct citation formats.

Project Grading

In total there are 50 marks available for the 5-credit option and 150 marks available for the 10-credit option. These marks will be divided as indicated below.

Marks for the reports will be based on the quality of the report submitted. Care should be taken to provide a clear and comprehensive description of your project proposal and completed work. Reports should be prepared in a professional manner with careful attention to formatting, writing style and language, and scholarly references.

Marks for the prototype/mockup will be based on the quality of the proposed GWAP and the level of detail and sense of experience that has been captured by the mockup.

Marks for the implementation will be based on the quality of the code and the completeness of the implementation. While it might not be necessary to implement every feature of the GWAP, special attention will be paid to those components that are essential for a GWAP, namely the game and the gameplay.

COMP 30490 – 5-Credit Option (50 Marks)

- Project Proposal Document – 10 Marks
- Prototype / Mockup - 15 Marks
- Final Project Report - 25 Marks

COMP 41440 – 10-Credit Option (150 Marks)

- Project Proposal Document – 10 Marks
- Implementation – 100 Marks
- Final Project Report – 40 Marks

Late Submission Policy

Late submissions will incur a 10% penalty per day or part thereof (including weekends). If you have a problem or issue that you believe merits some special consideration then please make sure to contact the demonstrators as early as possible to discuss. Coming to us a week after submission to alert us to a problem that you have had during semester rarely ever leads to a satisfactory outcome.

Remember we are here to help as best we can. We want you to succeed with, and enjoy, your project. But we can only lend our help when you let us know you want it.

Plagiarism Policy

The rules and penalties in relation to plagiarism have been discussed in class. Plagiarism is a serious academic offense and suspected incidents will be referred to the School's sub-committee. Typically a 0% or NG mark will be assigned for confirmed plagiarism incidents and second offenses will be referred on to UCD's disciplinary committee.

Some Ideas … with may or may not make good GWAPs

Coming up with an idea for your GWAP is hard. You should be starting to think about it already. In an effort to help get your creative juices flowing here are some admittedly sketchy ideas for areas you might want to consider. Bear in mind that they are at best half-baked ideas and no doubt some/many will not make for good GWAPs but they may help get you thinking during these early stages.

Health & Wellbeing

- A GWAP to help people make healthier choices about what they eat or help them better understand the health implications of their diet.
- On the issue of food, how about a GWAP that would help to estimate the nutritional content / calorie count of a plate of food; think instgram/foodspotting meets weight-watchers.
- A GWAP to help people get more exercise; can you build a game that will help people to exercise and a by-product perhaps help others to get the exercise that they need.
- A GWAP to help people get more sleep and perhaps, as a by-product, help to capture the type of data that others could benefit from in improving their sleep practices.
- A GWAP to help people declutter their homes/lives, and perhaps as a by-product they could make their clutter available to others for free (free-cycling).
- A GWAP to help people relax and de-stress. For example, what about a GWAP that asked you how you liked to relax (e.g. listening to music, sitting in silence, mindful meditation, cooking, etc) and measured how much you did each day and how you felt before and after. The results of this could be used to help others to learn how to relax.

Smarter Media

- A GWAP to summarise the day's news. Imagine a two-player game in which players read news stories and highlighted important sentences so that collectively their highlights acts as summaries.
- A GWAP for extracting entities from text. E.g. a game that presents players with news stories/tweets or other text and asks them to highlight the people, places or things; very useful for text analytics.
- What about a GWAP to find interesting tweets on a topic. The players benefit by enjoying the tweets the read and the ones the like/agree-on help to build a picture of the best tweets on a topic.

E-Commerce & Recommendation

- What about a GWAP for learning user preferences of item meta-data for recommender systems?
- Or a GWAP to help people discover new products, emerging bands, etc.
- Could you build a GWAP to predict box office success for movies or chart success for music?

Hyperlocal

- As we move into the world of VR/AR, what about a GWAP to encourage people to produce geo-coded photos of places, that might later digitally stitched together to form a 3D model of a location?
- A GWAP to help people to make better use of energy, waste less, or conserve water, while at the same time producing insights and hints/tips for others to do the same.

Education

- A GWAP to help people to learn to read and as a side effect grades the difficulty of exercises based on how often players get the tasks right. Similar for maths etc.
- What about a GWAP to help kids learn to code? What might that be like?