

COMP47250: Team Software Project

Credits 30
Subject Computer Science
Level 4
School Computer Science & Informatics

After graduation, many technology students move to industry, frequently working in multi-disciplinary teams where they collaborate to bring about solutions to industrial, social and consumer problems that are desirable, effective, user-friendly and economically viable.

To develop such solutions teams must demonstrate a range of skills including creativity, design, software development, project management, teamwork, stakeholder management and software evaluation. Mastery of these skills will allow a team take a project from initial feasibility through first rough concept to a working prototype. In this module students will work through this process utilising the existing skills that they have already accumulated through previous study and new skills learned during the module.

At the beginning of the module students will be arranged into pre-assigned teams of between 3 and 5 students and presented with a set of problem specifications from which to select a project. The assignment will be based on a Questionnaire filled by students describing technical/communication skills and demographics.

The main focus of the module will be on developing a software solution to address the selected problem specification¹. In the early portion of the module students will focus on the design skills required to determine the set of features that comprises the minimal viable product that addresses the problem specification. In the latter portion of the module students will develop the minimal viable product.

Much of the contact time in the module will involve facilitated group work during which students work on their projects with support from the module coordinators. During the course of the module there will also be lectures and lab sessions for students. These sessions will be focused on specific skills including design thinking, the lean startup methodology, agile software development methodologies, project management, user experience design, software evaluation and presentation skills.

What Will I Learn?

By the end of the course, the student will have learned and applied the key skills required to develop desirable, effective, user-friendly and economically viable software solutions including:

¹ All problem specifications will involve the development of a solution that involves a significant level of sophistication from one of the other modules students are likely to have taken on the programme - for example the development of machine learning modules, the use of natural language processing, or the deployment of cloud solutions.

1. How to manage and deliver a software development project within a team environment using appropriate software development methodologies (for example, agile software development methodologies)
2. Design and implement a significant software prototype using appropriate software development tools and techniques.
3. Understand methods to design solutions to a problem specification that are effective, user-friendly and economically viable (for example design thinking, user experience, and business model canvas)
4. How to use data analytics of publicly available data
5. Prototype solutions in successive rounds with user feedback and with increasing realism and detail (for example using the lean startup methodology)
6. Evaluate and test software solutions with users and other stakeholders
7. Present and demonstrate a working prototype to users and stakeholders

Recommended Technology: Django + Python, other technologies allowed too, with adequate justification.

Calendar

The calendar for the module will allow for one contact session each week. This will be used for a mixture of lectures, lab work and group mentoring. The following is an indicative timetable for the module:

Week 1 (Tue, 26/05/15, 10:00 – 17:00, CSI B.0.02):

Module Introduction lecture; Lean/Agile Methodology Workshop; Business Model Canvas Workshop; The Contextualisation of News; Mentored Lab (teams should form and select projects in this lab)

Week 2 (Tue, 02/06/15, 13:00 – 17:00, CSI B0.02):

Special Topic 1 (Tutorial on Django + Python); Special Topic 2 (NLP and Text Classification); Special Topic 3 (Designing User Interfaces and User Experiences); Mentored Lab

Week 3 (Tue, 09/06/15, 13:00 – 16:00, CSI B1.06): Mentored Lab

Week 5 (Tue, 23/06/15, 13:00 – 16:00, CSI B0.02; Sat, 27/06/15, 10:00 – 12:00, CSI B0.02): Mentored Lab

Week 6 (Tue, 30/06/15, 13:00 - 19:00, CSI B0.02): Mid-term presentation

Week 8 (Tue, 14/07/15, 13:00 – 16:00, CSI B0.02): Mentored Lab

Week 10 (Tue, 28/07/15, 13:00 – 16:00, CSI B0.02): Mentored Lab

Week 12 (Tue, 11/08/15, 13:00 – 16:00, CSI B0.02; Sat, 15/08/15, 10:00-12:00, CSI B0.02): Mentored Lab

Week 13 (Tue 18/08/15, 10:00 – 19:00, CSI B0.02): Final project presentations

Demo paper + business model canvas due Friday, 21/08/15.

Project Specifications

The overarching theme of the projects is: “**Contextualisation of News**”, i.e., providing context for news articles using publicly available data and APIs. For example, news articles can be gathered from public RSS feeds: e.g., BBC. (by scraping XML files). Social media data can be retrieved using Twitter API, Youtube API, Facebook API, etc., to provide more context for the retrieved news articles. The data for providing context can be in the form of text, images, videos, product or business reviews (e.g., Yelp data).

Example projects: Contextualise news using RSS newsfeeds and Twitter API.

1. Retrieve tweets relevant to set of news articles + Visualization of tweet set diversity and hashtags over time.
2. Twitter hashtag recommendation for news articles.
3. News article summarisation based on retrieved relevant tweet set.
4. Recommend socially trending news (news articles with lots of social media discussion).
5. Twitter event detection: identify emerging events based on streaming Twitter data, relate these events to current or historical news articles.
6. Optimize the headlines of news articles using Twitter reaction as a guideline.
7. Analyse the Twitter user network discussing news articles (e.g., who are these users, cultural/political biases).

Similar ideas for projects, using other APIs (Youtube, Facebook, boards.ie, daft.ie, LinkedIn, Reddit, Yelp):

8. Retrieve Youtube videos relevant to a set of news articles.
9. Youtube event detection: identify emerging events based on streaming Youtube video titles. Relate to upcoming/historical news articles.
10. Retrieve Facebook posts relevant to a set of news articles.
11. Retrieve boards.ie posts relevant to a set of news articles.
12. Retrieve Reddit posts relevant to a set of news articles.
13. Retrieve Yelp posts relevant to a set of news articles (Yelp provides reviews of businesses).
14. Tracking topics covered by a news outlet, in comparison to other competitor news outlets (e.g., which stories are covered by the Irish Times, but not by The Independent?)

15. For healthcare news articles, retrieve data from health-forums discussing related issues to that article (e.g., new/existing drug, what are people's reaction to it?)
16. Relate news stories via the key concepts they talk about (e.g., via named entity recognition and connections between those entities in Yago/Dbpedia) .
17. Retrieve relevant statistics for news story from census (or other public open data World Bank, CSO, UN, etc) datasets.
18. Sentiment analysis of the news article.
19. Location-based retrieval of news and context.

Milestones

Project progress will be marked by the following milestones:

- Week 1: Teams assigned and projects agreed
- Week 6: Mid-term presentation of initial prototype
- Week 13: Final presentation of prototype

Deliverables

The following deliverables will be required at the end of the project:

- Working software prototype (code on github)
- Demo paper describing the system (6 pages, template provided)
- Completed business model canvas describing the commercial opportunity associated with the project (1 page, template provided)

How will I learn?

Hrs/Semester

Lectures	12
Labs	36
Autonomous Student Learning	552
Total Workload	600

How will I be assessed?

	% of Final Grade
Team assignment: Mid-term presentation	5
Team assignment: Final presentation	10
Team assignment: Business model canvas	10
Team assignment: Demo paper	15
Team assignment: Demo prototype	40
Jazz (perform excellently in one or more aspects)	20

A peer assessment mechanism will be used to assess the individual contributions to the project. Each group will be awarded an overall mark and each team member will be awarded a modified version of this group mark based on the outcome of the peer assessment process.

Grading Guideline

The final grade is an aggregation of grade for the 3 milestones + deliverables above. The requirements for passing/excellent grade are outlined below.

- **Pass:** Working demo prototype (offline on local machine) providing basic functionality + demo paper describing the data and system + completed business model canvas.
- **Good:** Working prototype (offline on local machine) + advanced functionality from other modules (ML functionality, cloud, distributed) + good demo paper + strong business model canvas.
- **Excellent:** Working prototype (online Web app accessible with browser, real-time) + advanced functionality from other modules + excellent demo paper + excellent business model canvas.

What Happens if I Fail?

Compensation

This module is not passable by compensation

Resit Opportunities

In-semester assessment

Remediation

If you fail this module you may repeat, resit or substitute where permissible. This module is not passable by compensation.

Am I Eligible to Take this Module?

Module Requisites and Incompatibles

Pre-Requisite :

Required :

Co-Requisite :

Incompatibles :

Additional Information :

Equivalent Modules

Prior Learning

Requirements:

Excluded:

Recommended:

References

Lean/Agile Methodology

Book: Eric Ries (2011), "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses",
(<http://theleanstartup.com/book>)

Designing User Interfaces and User Experiences

Book: Ben Shneiderman, Catherine Plaisant, Maxine Cohen, Steve Jacobs, Prentice Hall, 2009: "Designing the User Interface: Strategies for Effective Human-Computer Interaction"

Contextualisation of News & Future of News

Future of News: Seven insane ways tech will change news
<http://www.bbc.com/news/technology-30897482>
<http://ajr.org/2014/10/28/radically-different-future-news/>

Research Papers: e.g., Social News on the Web, 2014 (<http://www.snow-workshop.org/2014/>)
Towards Social Event Detection and Contextualisation for Journalists, P. Khare, B. Heravi
Demos: insight4news.ucd.ie/insight4news

Business Model Canvas

Book: Osterwalder & Pigneur, (2010), "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers", Wiley, ISBN [8126533676](https://www.wiley.com/en-us/9781118285599)

Python resources + useful libs:

IDE: PyCharm (Free with class license or individual student license)
Style guide: <https://google-styleguide.googlecode.com/svn/trunk/pyguide.html>
Book (free): <http://www.greenteapress.com/thinkpython/thinkpython.pdf>

Online tutorials:

<https://docs.python.org/3.4/tutorial/>
<http://www.codecademy.com/en>
iPython Notebook: <http://ipython.org>
Useful Libs: nltk, scikit-learn, numpy, scipy

Django resources:

<https://www.djangoproject.com>

Text processing, NLP, IR:

Book: <http://www.nltk.org/book/>
Book: <http://nlp.stanford.edu/IR-book/pdf/irbookprint.pdf>