Project Briefing for CST II Students

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2020 − 2021

(With thanks to all prior project briefing officers for slides)

Welcome back!

Welcome back!

(Now it's time to get down to work!)

Part II structure

Key points:
- Exam is
  - (50%) three papers
  - (75%) two papers & two units of assessment
  - (both) + project dissertation
- Dissertation = quarter of total marks!
- Two weeks to get project proposal accepted

Goals of the project:
- Demonstrate computer science skills
- Design, implement, test something substantial
- Select suitable methods and tools
- Prepare a convincing report

Overseers

Two Overseers assigned per student

- ▶ Help with selection of project and its progress
- ▶ Formally approve project
- ▶ Advise on tools and approach
    - ▶ Computing equipment
    - ▶ Languages, libraries and tools
    - ▶ Any special devices

Overseers do not suggest projects or find project Supervisors

- ▶ Your **Director of Studies** is responsible for helping with both

2020/21 CST project timetable

Fri 9 Oct
    12noon: Upload preliminary project information on to Moodle
    5pm: Overseer groups posted

Mon 12 Oct, 3pm
    Phase 1 report form to overseers

Fri 16 Oct, 12noon
    Draft proposal to overseers

Fri 23 Oct, 12noon
    Proposal deadline

Fri 5 Feb, 12noon
    Progress report deadline

Fri 14 May, 12noon
    Dissertation deadline

Fri 18 June
    Vivas, if called

Microtimetable for choosing a project

These are your first tasks:

- Phase 1 - Selecting a Topic
    - Fill out the Moodle form to tell us your (tentative) topic
    - Write 100 word outline of project idea
    - Get Overseers' approval
- Email *Phase 1 Project Selection Form* to Overseers

Overseers accept plain text emails and PDFs for the final drafts

Include the information from the final cover sheet on intermediate emailed drafts

Deadline: Monday after the project briefing

Phase 1: project selection form

Please complete this form and email it **to both your Overseers**

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Phase 1 Project Selection Status Report

      Name:
      College:
      User Identifier:
      Director of Studies:

Please complete 1, 2 and 3 below.

      1. Please write 100 words on your current project ideas.

      2. Please list names of potential project supervisors.

      3. Is there any chance that your project will involve any
         computing resources other than the Computing Service's MCS
         and software that is already installed there, for example:
         your own machine, machines in College, special peripherals,
         imported software packages, special hardware, network access,
         substantial extra disc space on the MCS.

        If so indicate below what, and what it is needed for.
```

Sources of projects

Main sources:

- ▶ Your own ideas
- ▶ Supervisors and Directors of Studies
- ▶ Previous years' projects
- ▶ Industry
- ▶ Projects web page

The best projects typically:

- ▶ Require learning/study/research
- ▶ Use a complex central data structure or algorithm
- ▶ Are amenable to quantitative evaluation

Phase 2: filling in details

After that, fill out the proposal

- Write a few hundred words of description
- Devise a timetable, for example:
  - Ten two-week work-packages
  - First two might be preparatory work
  - Last three writing your dissertation
  - Practical work in the middle
  - Progress report a part of fifth
  - Identifiable deliverables and deadlines
    (Ideally have a primary success criterion due in the Lent Term)
  - Leading to submission in early May
- Determine special resources, check available
- Secure a suitable project Supervisor
- Ask Overseers to check details

Deadline: Friday, 1 week after the briefing

Produce final copy including:

- ▶ Coversheet as first page
- ▶ Human subjects page if necessary
- ▶ Risk assessment page if necessary
- ▶ Body of proposal, including milestones and timetable
- ▶ Resources declaration

Deadline: Friday, 2 weeks after the briefing

The project proposal

This outlines the project as you intend to complete it

- About 1,000 words and A4-sized pages
- First page **must** summarise:

  The proposer:
  >   Your name, college and user identifier
  The project:
  >   Its title and the name of its originator
  Supervision arrangements:
  >   Project Supervisor and Director of Studies
  Then the main sections...

- Use the PDF project proposal cover sheet from the web page

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Read the Pink Book thoroughly

The proposal body details

You should include:

1. An introduction and summary of the work to be undertaken
2. A description of the **starting point**
3. A description of the substance and structure of the project
   - Key concepts
   - Major work items
   - Data structures and algorithms
4. A success criterion
5. Envisaged evaluation metrics
6. A plan of work, specifying a timetable and milestones
7. A resources declaration
8. Optional risk assessment sheet: high voltages, knife throwing machines, ...

Computers

MCS Facility

- ▶ Many PC workstations
- ▶ Supported by the Computing Service
- ▶ Dual boot into Windows or Linux

Relying only on your own PC is dangerous

- ▶ Need PC backup plan (to MCS or otherwise)

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- ▶ Genuine extract from a past project:
  Unfortunately my write up became corrupted on disk towards the completion date. I have had to rewrite the dissertation over the last 36 hours and this has resulted in a much smaller write up than the original (ie 4000 words as opposed to 10000 words).

Please don't let this happen to you!

Using your own computer

Write "`I plan to use my own computer`" in your resource declaration

Give its description and your backup plans. For example:

- *My computer: 3 GHz CPU, 4 GB RAM, 300 GB Solid-state disk, Linux OS*
- *My contingency plans against data loss are that everything will be held under git on Bitbucket with daily checkpoints to my Google Drive and also weekly to SD Cards kept only for that purposes.*
- *My contingency plans against hardware/software failure are that I can easily transition my work to the MCS. . .*

You are warranting that you accept full responsibility for any hardware and/or software failure

Human-subjects approval

Experiments involving human subjects require approval by the Department's Ethics Committee

- ▶ Getting your friends to test your software is an experiment on humans
- ▶ Be careful with personal data (avoid data protection offences)
- ▶ Be careful about misleading your victims (avoid a conviction for fraud)
- ▶ Follow best practice in conducting this part of your evaluation (there are established methods for conducting HCI trials)
- ▶ **You** must fill in the box in on the cover sheet
- ▶ **Your Supervisor** must complete and submit an online form to the Ethics Committee for you

Units of assessment

Many (almost all) of you will be doing two units of assessment
- ▶ Hopefully one in Michaelmas, one in Lent

It is very important to think carefully about the work
- ▶ Students mainly get into difficulties through a lack of planning
- ▶ Don't underestimate the time required for coursework

Know your deadlines for your units of assessment
- ▶ Plan when you will do the coursework for them
- ▶ Plan when you will do project work around them
- ▶ Plan when your supervisions will fit around them

Proposal sign-off requirements

A named project Supervisor

Project resources declaration

- ▶ Describe the equipment you will use
- ▶ May include libraries or databases
- ▶ Name the person/people granting access
  - ▶ And a letter for confirmation for third-party resources

Ensure your Director of Studies is happy

Ensure both your Overseers are happy

- ▶ They should have approved by email before you submit
- ▶ They will formally approve after you submit

Advice on starting work

Acquire a project log book
- ▶ Very useful when writing up

Try to keep to the timetable

Continually review progress

Consider goals & organisation **immediately**
- ▶ In parallel with learning needed skills

Think early and often about evaluation

Learn From The Past

Comment from Examiners on evaluation

My experience from four years of reading dissertations is
that there is one failure mode exhibited by roughly a third
of dissertations. This failure mode is exhibited as
excellent Preparation chapter, adequate Implementation
chapter, appalling Evaluation chapter.

I think this failure more often reflects students poor
planning rather than poor evaluation skills. It usually
comes across as: I spent lots of time thinking about my
project, didn't manage to complete the implementation
properly and had no time left to do any sort of evaluation.

Lent: progress report & presentation

The report should be 300 to 500 words, A4 sized

- ▶ Your name, crsid and project title
- ▶ Names your Project Supervisor
- ▶ Names your Director of Studies
- ▶ Names your Overseers
- ▶ Describes what work has been completed and how this relates to the timetable and work plan in the original proposal
  - ▶ Is it on schedule, or how much behind?
  - ▶ What unexpected difficulties have arisen?
  - ▶ What has been accomplished?

Submitted via Moodle

You may also request an additional private meeting with Overseers

Progress presentation

Five minute, **compulsory**, presentation to your Overseers and overseeing group

Overseers will write a mini-report of a few sentences, which is sent to Supervisors and Directors of Studies

Format:
- Feb 2021: Thu 11, Fri 12, Mon 15 or Tue 16
- At 2pm
- Projection from laptop recommended
- Use at most 4 slides

Oral report should be carefully rehearsed

Once more, planning is key

- ▶ Don't leave things until the last minute
- ▶ Start writing the project report early
- ▶ Make sure you can create a PDF that is less than 15 MByte and preferably has embedded fonts
- ▶ Missing the submission deadline results in marks deducted!

$$penalty = \frac{10 + n}{40} \times mark$$

  n is the integer part of number of days late

- ▶ This is a hard and severe penalty
  - ▶ Kicks in immediately after deadline
  - ▶ Minimum of a quarter of marks lost

Aims of final dissertation

The main aims of writing the final dissertation are to

- ▶ Demonstrate ability to plan and execute a large project
- ▶ Show understanding of the project's area of Computer Science
- ▶ Demonstrate ability to select appropriate tools (languages, algorithms, data structures etc.)
- ▶ Present evidence that the end result works as claimed
- ▶ Show ability to prepare a well-structured and readable document
- ▶ Demonstrate knowledge of best professional practice, ethical factors and potential commercial and societal impact

Compulsory dissertation format

Aim for about 10,000 words

- ▶ Must be less than both 12,000 words and 40 pages
  (from introduction to conclusions inclusive)

Required form:

	Cover Sheet
	Declaration of Originality
	Proforma
	Table of Contents
Chapter 1	Introduction
Chapter 2	Preparation
Chapter 3	Implementation
Chapter 4	Evaluation
Chapter 5	Conclusions
	Bibliography
	Appendices
	Index
	Copy of Project Proposal

Declaration of originality

Dissertations must include a declaration:

- ▶ Immediately before the Proforma

Must have exactly the following syntax:

I, [Name] of [College], being a candidate for Part II of the Computer Science Tripos, hereby declare that this dissertation and the work described in it are my own work, unaided except as may be specified below, and that the dissertation does not contain material that has already been used to any substantial extent for a comparable purpose. [I am content for my dissertation to be made available to the students and staff of the University.]

Signed [signature]

Date [date]

As ever, the Pink Book has more explanation and details

Plagiarism

Obviously all the normal rules on plagiarism apply

Although self-plagiarism (quoting yourself) is not explicitly mentioned

- ▶ It's still good practice to highlight this
- ▶ E.g., "As I wrote in my proposal, 'blah, blah, blah"'

If you quote from a model proposal you must properly attribute it

- ▶ Even if you are doing that model project

https://www.cst.cam.ac.uk/teaching/exams/plagiarism.html

Submission

Submit:

1. An electronic (PDF) copy of your dissertation, which will be electronically scanned for plagiarism and/or word count. Your work will be blind marked

2. A zip of all source files you created or substantially modified and perhaps example output files that substantiate your claims. You do not need to submit supplementary materials required to re-create a working version of your project (these might be under NDA etc.)

Examiners **may** only look at the five dissertation chapters, so do not rely on appendices or the code zip for credit.

Copyright & intellectual property

You retain full copyright and ownership rights over your work

- ▶ Everything you submit must be free from IP restrictions (e.g. NDA)
- ▶ Your source code will not be used for any purpose other than examination and will not be distributed outside the Computer Laboratory
- ▶ You normally grant the University the right to limited, not-for-profit distribution of your dissertation for other University members to read
- ▶ Precise information in the Pink Book

Assessment

Each dissertation is read by at least two examiners

- ▶ And possibly by an additional expert

Each dissertation is marked as follows:

	Marks
Professional Practice and Presentation	14%
Introduction and Preparation	26%
Implementation	40%
Evaluation and Conclusion	20%

Presentation: credit for literacy and narrative quality (fonts/layout yield marginal credit)

Other guidelines at the end of the Pink Book

Viva voce examination

Some students get called for a *viva voce*

- ▶ The Examiners will announce the date of vivas
- ▶ If you will be away on that date, you must inform the examiners via your tutor
- ▶ You may be asked any question:
  - ▶ Did your project really work?
  - ▶ Did you really write this function yourself?
  - ▶ Etc. . .
- ▶ Most years, few people are called for viva
  - ▶ Across the spectrum of ability, not just borderline cases
- ▶ Viva concerns your project **only**

Selection advice — reiteration

- Choose something with significant technical content
- Ideally implement some complex algorithm
- Do not do something big yet simple

- Choose something interesting
- Phrase a question or two at the outset
- Answer the questions in the conclusion

- Choose a project amenable to structured evaluation
- *'It worked according to plan'* is not sufficient
- Components ideally separately testable
- Composition ideally evaluatable using several metrics

Good luck!

`https://www.cst.cam.ac.uk/teaching/projects/`

Email me at any time over the next 7 months with questions
`timothy.jones@cl.cam.ac.uk`