Informatics Research Proposal

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MSc: Two components

- **Taught component (100 credits)**
  - lectures, tutorials, coursework, exams
  - learn established techniques that work

- **Research component (80 credits)**
  - do something that’s never been done before
    - study a new problem, develop a new method, etc.
    - probably the most exciting (and hard) part of MSc
  - culminates in you writing a ~50-page dissertation
    - mark is based solely on the quality of your write-up
  - two courses prepare you:
    - **IRR**: write a literature review in area of interest
    - **IRP**: write a detailed plan for your MSc project
MSc project timeline

• **Semester 1 (IRR)**
  — learn about a relevant area: read research papers
  — write a 3000-word summary of what you learned

• **January:**
  — staff proposes project topics (or students self-propose)
  — you pick topics that you like, talk to supervisors

• **Semester 2 (IRP):**
  — write a detailed plan for what you’re going to do

• **April/May:**
  — pass 120 credits with 50% average
  — IRP is worth 10 credits

• **Summer:**
  — work on your project (build things, test them, analyse results)
  — write a dissertation
IRP vs IRR

- *Proposal of a research project (your* summer project)
- Assessed by project supervisor
- **Mandatory** tutorial groups and meetings with supervisor

- Literature review
- Assessed by tutors
- Mandatory tutorial groups
Projects

• Will be announced shortly.

• Talk to the supervisors before making choice

• Self-proposed projects are possible
Goal of IRP

• Learn skills of research planning

• Confirm choice of research area

• Scope out your summer project
Further goals of IRP

- Knowing *what* to *work* on is a big *part of research*
  - *Motivation* is identifying a *void* in the *literature*, or a real-world *problem* that has *not* been *solved*
- Coming up with a feasible way to address the problem
- Propose *ways of evaluating* the *techniques*
- Present *expected outcomes* *succinctly* and *objectively*

- Important skill:
  - For PhD applications
  - For grant writing
Approximate IRP Timeline

- Jan. Introductory Lecture
- Jan. IRR DEADLINE
- Jan. MSc project topics announced
- Jan. submit your project preferences
- Feb. projects assigned to students
- Feb – Apr: IRP
  - attend weekly tutorials
  - ask your tutor about:
    - presentations within group
    - first draft deadline + feedback
- Apr. submit IRP

contact potential supervisors

regular meetings with your supervisor
Components of the IRP

- Regular meetings with project supervisor:
  - schedule a regular time, do not let it slip
  - supervisor marks your IRP (not the tutor)
Components of the IRP

• Continue to meet with IRR groups:
  • meet every week, tutor will arrange meeting times
  • same groups, same tutors (mostly)
  • Get in touch if you want to switch groups
    note that precise group is not very important
  • tutors are there to help you. Use them.
  • attendance is mandatory: ignore meetings = fail IRP
Relation with supervisor

- Weekly meetings are a good starting point, but cancel if you had no time to work on things.
- On the other hand, do not cancel if you are stuck!
- Bad: Last minute cancellations.
- Bad: Asking feedback on many versions of your IRP.
- Good: Show initiative.
- Good: Search and read secondary literature.
- Good: Start thinking about doing the actual project.
IRP: Structure of proposal

- **Motivation**: aims and objectives, hypothesis, timeliness, significance, feasibility, novelty, beneficiaries
- **Background** material (use your IRR if you can)
- **Methodology** and **techniques** to be used
- **Metrics** for evaluation
- **Outcomes**
  - application? experimental results? new data?
- **Research plan** (in the form of a Gantt chart, or simple list)
IRP: Getting started

• The *supervisor’s proposal* is a good starting place

• How would you *change it* to make it *clear what to do*?
  • consider both *research* perspective, and *skills* perspective
  • your IRR may also be helpful here

• *Further study* to identify the *exact scope* of the project?

• What is the actual *hypothesis/claim* you will be *investigating*?

• What *evidence* is necessary to *support* the hypothesis/claim?
How can claims be established?

• **Theoretical** claims: *proof* of some property
  • Correctness, soundness, completeness, complexity, *etc.*

• **Experimental** evidence: analytical *metrics*
  • Running times (raw performance)
  • Success rates (e.g., precision and recall in IR)
  • Comparison between different approaches
  • Match between data and simulation
  • Comparison between computer and human output
How will you evaluate your project?

• Think about: “When is this project successful?”

• A **crucial part** of the project (although it is dependent on the field)

• Thought experiment: suppose everything works as planned….

• Identify the **metrics**
  • metrics help you **form** the **hypothesis** and **solution**
  • in essence, the **nature** of the **project**

• Must be **clear** in the **proposal**
  • **discuss** it with your **supervisor**
  • **do not leave it** until the last minute
Plan ahead

• Break your project into *work-packages*

• What are their *dependencies*?
  
  • How should you *tackle* them?

  • In *series*, or in *parallel*?

  • Some will be *essential*, some will be *optional*

• How much *time* will each *work-package* need?

  • Build in some *slippage time*

  • *Do they fit* into the time available?

  • If *not*, *trim* the project!

• Assume for the project (not the IRP) one month for writing.
Example Gantt chart

- Specification
- Implementation
- Testing
- Evaluation
- Write-up

Timeline:
- June
- July
- August
Assessment

• Your report will be marked by your supervisor, numerical mark

• Assessment will be based on:
  
  • How well the project is motivated
  
  • Quality of research plan
  
  • Demonstrated understanding of area, including knowledge of literature
  
  • Clarity of expression and presentation
## IRP marking guidelines

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Possible considerations</th>
<th>absent</th>
<th>poor</th>
<th>fair</th>
<th>good</th>
<th>v. good</th>
<th>excellent</th>
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<tbody>
<tr>
<td>Literature</td>
<td>Concise review of literature, correct referencing.</td>
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<tr>
<td>Introduction</td>
<td>Accessible to non-experts; motivation and relevance; audience</td>
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<td>Objectives</td>
<td>Clear statement of objectives; hypotheses.</td>
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<tr>
<td>Approach</td>
<td>Method; plan of work; evaluation metric; time-table.</td>
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<td>Presentation</td>
<td>Reasonable length, correct English, correct level</td>
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**Comments:**
- **Strengths** (box)
- **Weaknesses** (box)
- **Areas for Improvement** (box)

**Final Mark** (numerical):
Basic criteria (you need these!)

- Clear *explanation* and *justification* of each of the following

  - Project *aims* and *hypothesis*
  
  - Project *deliverables*
  
  - Research *plan*, with timetable of dependencies
  
  - Plans for *evaluating work / measures of success*
  
  - Relation to *previous work*
Additional criteria (it would be nice to have these)

• Convincing *arguments* about each of the following

• *Timeliness* and *significance* of research

• Potential commercial or academic *impact*

• *Backup* plan if original plan fails
Common problems

• *Hypothesis* is unclear, ill-formed

• Assuming, without reason, that *you will succeed* where *others have failed*

• *Insufficient detail* to assess outcomes

• *Unaware* of *related* research

• *Bad* presentation, *incomprehensible* report

  Audience: fellow student

• Too ambitious (better two good results, than five half results)
Avoid plagiarism

• Copying text from online sources is plagiarism
  • if you edit the words, it is still plagiarism
  • copy text verbatim (with no changes) and place it in quotation marks
  • explicitly cite where you copied from
  • All text should be written in your own words from the start
  • not an edited version of someone else’s text

• Guides on plagiarism
  • http://www.inf.ed.ac.uk/admin/ITO/DivisionalGuidelinesPlagiarism.html
  • http://www.ed.ac.uk/schools-departments学术服务/学术不端/学术不端
Plagiarism carries severe penalties

- Better to **submit nothing** than to **submit plagiarized** material

- **Submit nothing**: lose 10 credit points

- You **may still progress** to the MSc dissertation, decided by the Board of Examiners on a case-by-case basis

- **Submit plagiarized** report: Academic Misconduct review

- Average case: **downgraded to a diploma** (not an MSc but something)

- Worst case: **kicked out** of the program altogether
Re-using IRP in your MSc thesis

• The work but not the words of IRP can be used in thesis

• University policy: cannot be marked twice for the same work

• Cannot copy-and-paste sections from IRP into your MSc dissertation

• Two options:
  • Quote the included sections with a citation to your own IRP
    They will not be considered original material during the marking
  • Re-narrate those sections. (This is the better option)
    By August you will likely have a different understanding of the material.
As usual, pace yourself

• Work out a timetable for your writing
  • Split your time into reading, thinking, and writing
  • Leave plenty of time for feedback
  • Write at a steady pace
• Meet with your supervisor regularly
  • if they say no, keep contacting them
  • If problem persists, contact me: mvanross@inf
• For other problems: personal tutor. The earlier the better.