THE UNIVERSITY of EDINBURGH
informatics

Informatics Project Proposal (IPP)

Lecture 1: Introduction and Overview

2018/19

Björn Franke

Partially based on and adapted from earlier versions by
Mark van Rossum, Alan Bundy, Victor Lavrenko, Stratis Viglas

Core IRR Course Team

Aurora Constantin
IPP Teaching Assistant
(aurora.constantin@ed.ac.uk)

Björn Franke
IPP Lecturer
(bfranke@inf.ed.ac.uk)

Alison Thomas
Teaching Fellow
English Language Eduction

IPP Tutors

Overview

- Introduction
- Course Organisation
  - Timeline, Lectures, Tutorials, Project Supervisors
  - Website & Resources
- Technicalities
- Assessment
- Useful Information

THE UNIVERSITY of EDINBURGH
informatics

Your MSc Programme

- **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 hardest) part of MSc
  - Culminates in you writing a **dissertation** (~50 pages, 60 credits)
  - **Two courses** prepare you:
    - **IRR:** literature review in your broad area of interest (10 credits)
    - **IPP:** write a detailed plan for your specific MSc project (10 credits)

THE UNIVERSITY of EDINBURGH
informatics

MSc Project Timeline

- **Semester 1 (IRR)**
  - Learn about a relevant area: **explore** research papers
  - Write a 10-page **critical review** of what you learned
- **January**
  - Faculty supervisors propose **project topics**
  - Or, propose your own
  - Talk to supervisors, pick set of topics, algorithmic allocation
- **Semester 2 (IPP)**
  - write a detailed **research plan** for what you're going to do
- **Summer** (provided you progress to the dissertation stage)
  - Work on your **project** (build, test, analyse results)
  - Write a **dissertation**

THE UNIVERSITY of EDINBURGH
informatics

Why?

SCQF LEVEL DESCRIPTORS

scqf scottish credit and qualifications framework

LEVEL 11

The following descriptions are for guidance only –
it is not expected that every point will necessarily be covered.

CHARACTERISTIC 1: KNOWLEDGE AND UNDERSTANDING

- Demonstrate and/or work with:
  - Knowledge that covers and integrates most, if not all, of the main areas of the subject/discipline/sector – including their features, boundaries, terminology and conventions.
  - A critical understanding of the principal theories, concepts and principles.
  - A critical understanding of a range of specialised theories, concepts and principles.
  - Extensive, detailed and critical knowledge and understanding in one or more specialisms, much of which is at, or informed by, developments at the forefront.
  - A critical awareness of current issues in a subject/discipline/sector and one or more specialisms.

CHARACTERISTIC 2: PRACTICE: APPLIED KNOWLEDGE, SKILLS AND UNDERSTANDING

- Apply knowledge, skills and understanding:
  - In using a significant range of the principal professional skills, techniques, practices and/or materials associated with the subject/discipline/sector.
  - In using a range of specialised skills, techniques, practices and/or materials that are at the forefront of, or informed by forefront developments.
  - In applying a range of standard and specialised research and/or equivalent instruments and techniques of enquiry.
  - In planning and executing a significant project of research, investigation or development.
  - In demonstrating originality and/or creativity, including in practices.
  - To practise in a wide and often unpredictable variety of professional level contexts.

CHARACTERISTIC 3: GENERIC COGNITIVE SKILLS

- Apply critical analysis, evaluation and synthesis to forefront issues, or issues that are informed by forefront developments in the subject/discipline/sector.
- Identify, conceptualise and define new and abstract problems and issues.
- Develop original and creative responses to problems and issues.
- Critically review, consolidate and extend knowledge, skills, practices and thinking in a subject/discipline/sector.
- Deal with complex issues and make informed judgements in situations in the absence of complete or consistent data/information.

CHARACTERISTIC 4: COMMUNICATION, ICT AND NUMERACY SKILLS

- Use a wide range of routine skills and a range of advanced and specialised skills as appropriate to a subject/discipline/sector, for example:
  - Communicate, using appropriate methods, to a range of audiences with different levels of knowledge/expertise.
  - Communicate with peers, more senior colleagues and specialists.
  - Use a wide range of ICT applications to support and enhance work at this level and adjust features to suit purpose.
  - Undertake critical evaluations of a wide range of numerical and graphical data.

CHARACTERISTIC 5: AUTONOMY, ACCOUNTABILITY AND WORKING WITH OTHERS

- Exercise substantial autonomy and initiative in professional and equivalent activities.
- Take responsibility for own work and/or significant responsibility for the work of others.
- Take significant responsibility for a range of resources.
- Work in a peer relationship with specialist practitioners.
- Demonstrate leadership and/or initiative and make an identifiable contribution to change and development and/or new thinking.
- Practise in ways which draw on critical reflection on own and others' roles and responsibilities.
- Manage complex ethical and professional issues and make informed judgements on issues not addressed by current professional and/or ethical codes or practices.

THE UNIVERSITY of EDINBURGH
informatics

IRR vs IPP

IRR

- Literature Review
- Assessed by tutors
- Mandatory tutorial groups

IPP

- **Your** Project Proposal/Plan
- Jointly assessed by **tutor** and **project supervisor**
- Mandatory **tutorial groups** and **meetings with supervisor**

- Learn skills of **project planning**
- Confirm choice of (research) **project area**
- Scope out your **summer project**

Further IPP Goals

- 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 skills
  - For PhD applications
  - For grant writing
  - For industry project proposals

Course Organisation

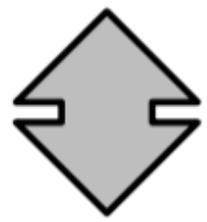
Approximate Timeline

- Jan. Introductory Lecture
- Jan. IRR DEADLINE
- Jan. MSc project topics announced
- Jan/Feb. submit your project preferences
- Feb. projects assigned to students
- Feb – Apr: IPP

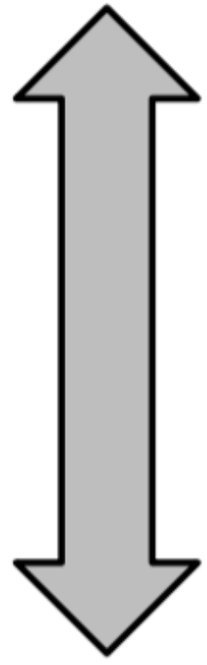
  attend weekly tutorials

  ask your tutor about:

  - presentations within group
  - first draft deadline + feedback
- Apr. submit IPP

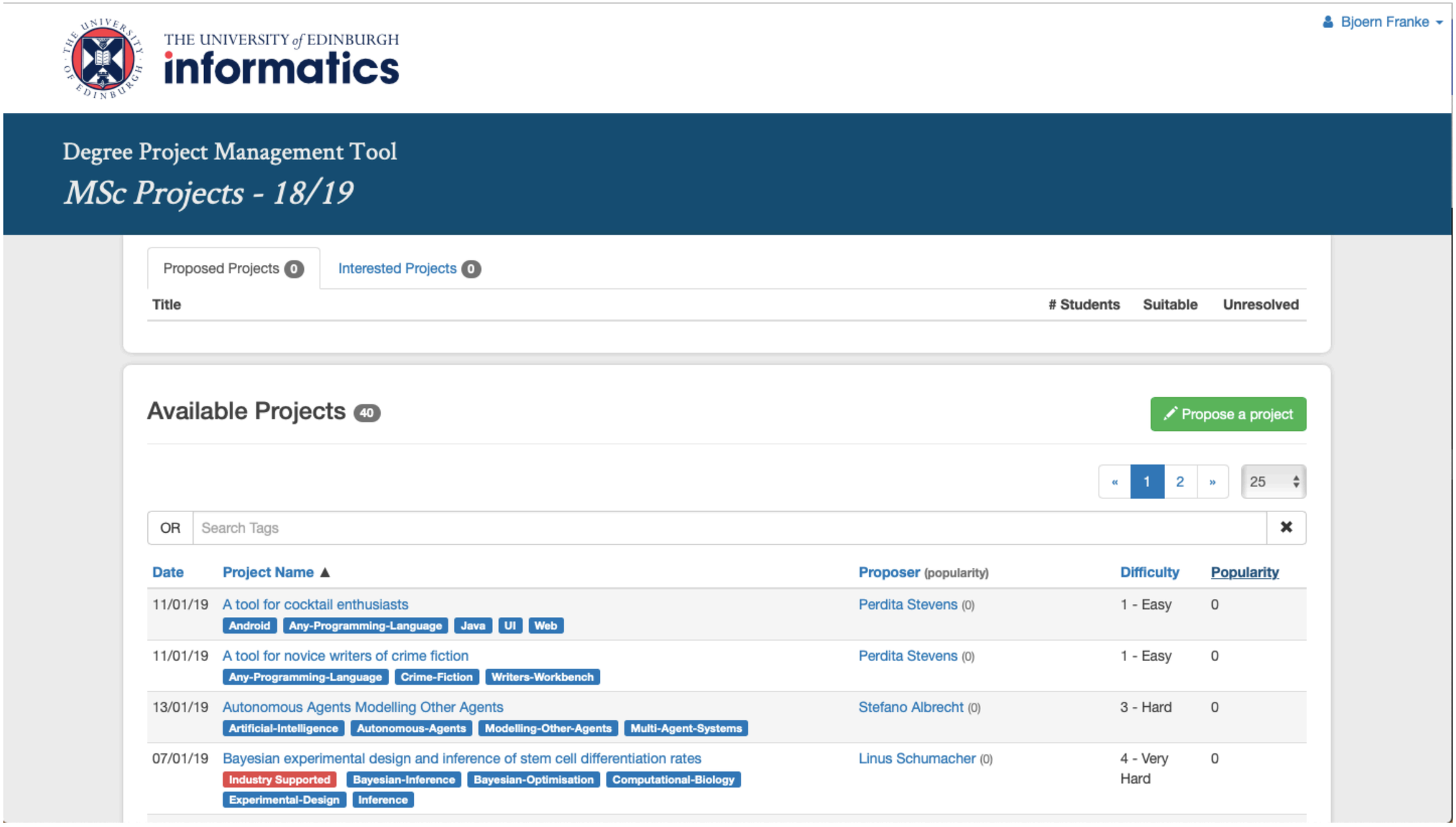


contact potential supervisors



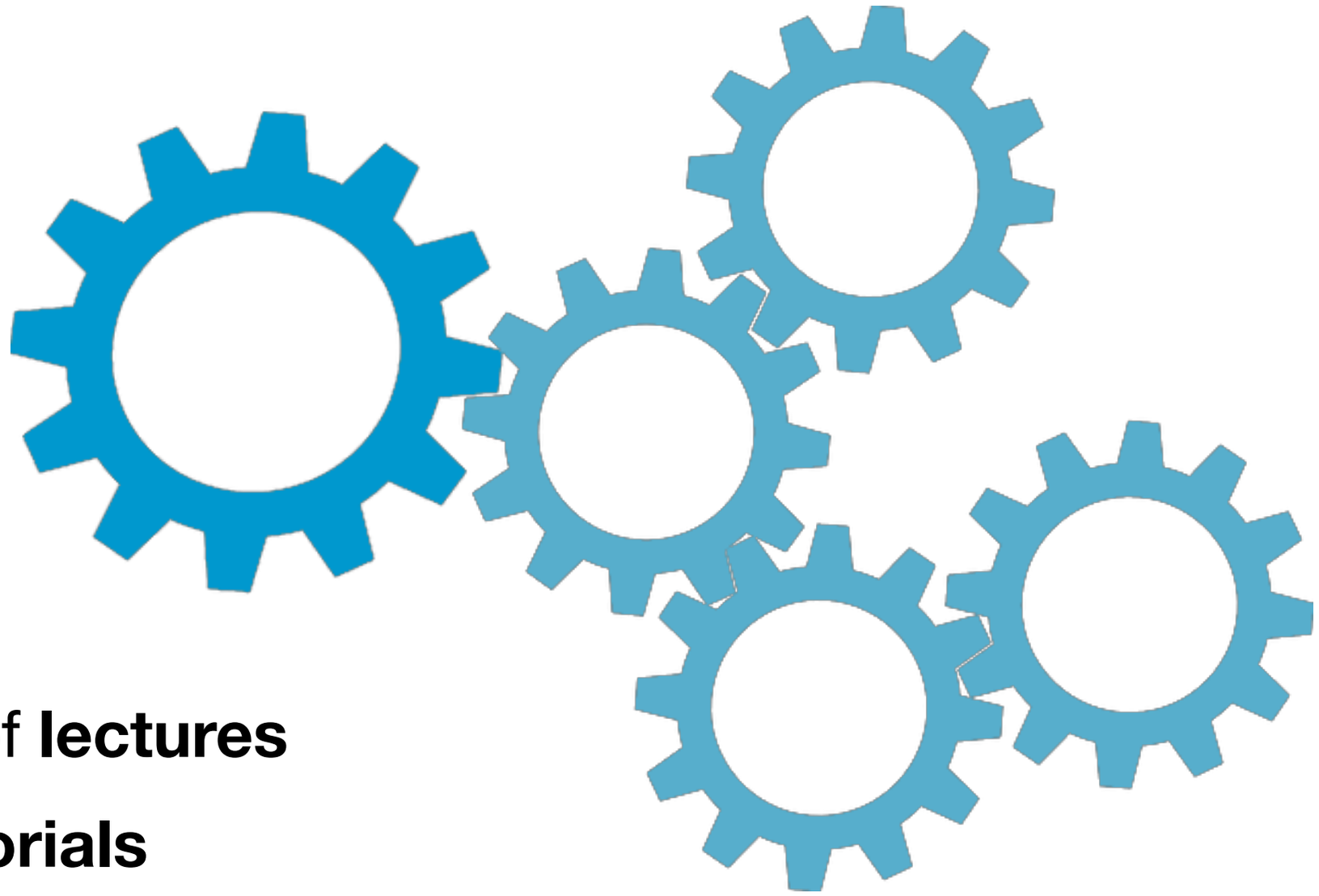
regular meetings with your supervisor

Degree Project Management Tool (DPMT)



THE UNIVERSITY of EDINBURGH
informatics

Components of the IPP



- Small number of **lectures**
- Weekly **IPP tutorials**
- **Regular meetings** with project supervisor

THE UNIVERSITY of EDINBURGH
informatics

LECTURES

1. Introduction and overview of the IPP course
2. ELE - TBC
3. ELE - TBC
4. General Data Protection Regulations & Ethics
5. Project Planning

IPP Tutorials

- Tutorials focus on **generic project planning** skills and **proposal writing**, not the technical content of your plan
- 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 IPP

THE UNIVERSITY of EDINBURGH
informatics

Regular Meetings with Project Supervisor

- Start **after project allocation**
- You are in charge to **schedule regular meetings**
  - Do not let it slip. Supervisors will not chase you.
- **Supervisors mark the technical content** of your report.

Relation with Supervisor

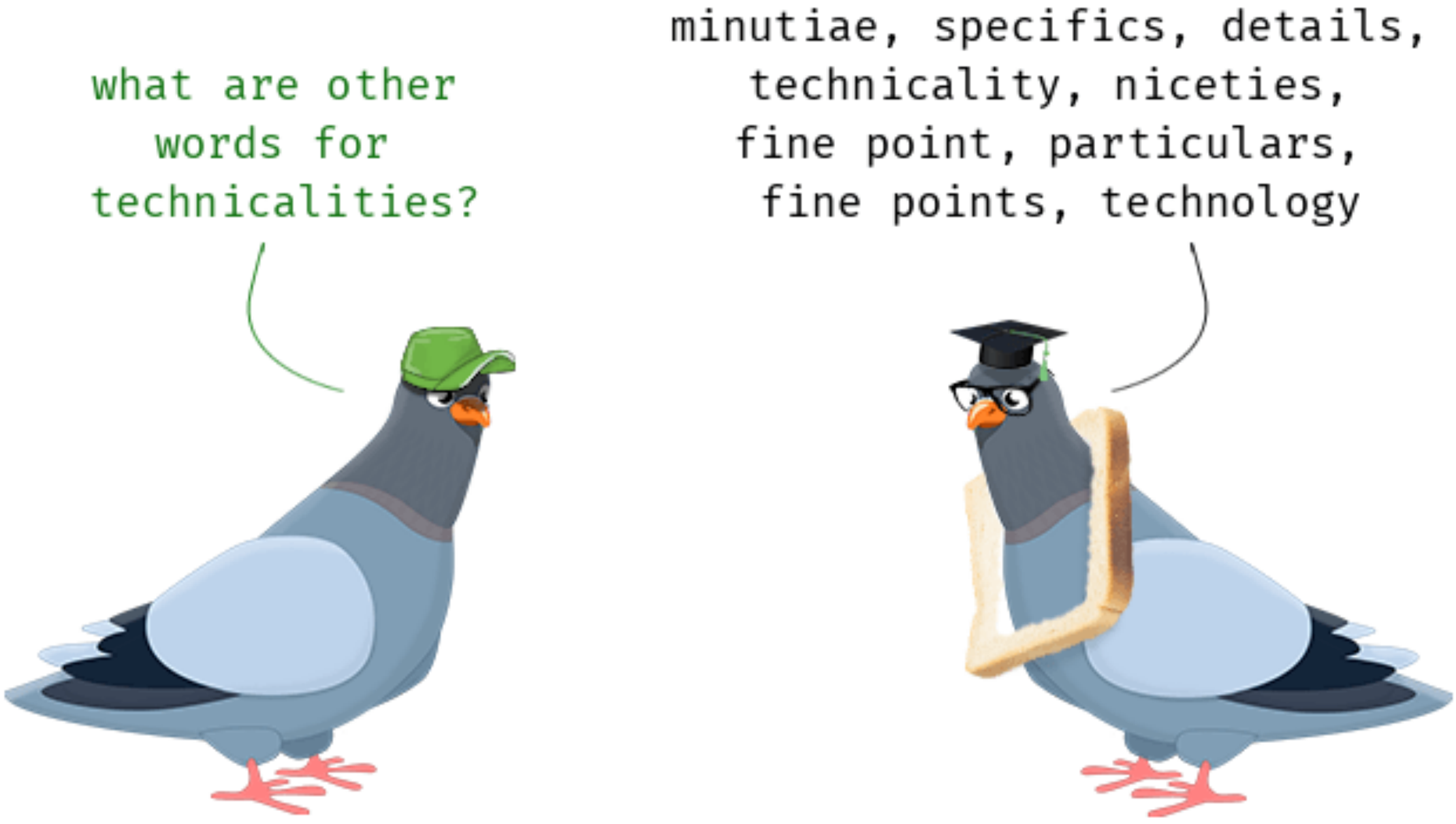
- **Weekly meetings** are a good starting point,
  but cancel if you had no time to work on things.
- On the other hand, **do not cancel if you are stuck**!
- **Bad practice**
  - Last minute cancellations.
  - Asking feedback on many versions of your IPP.
- **Good practice**
  - Show initiative.
  - Search and read secondary literature.

THE UNIVERSITY of EDINBURGH
informatics

Website & Resources

- Course Website - will be continually updated
  http://www.inf.ed.ac.uk/teaching/courses/ipp/
- LEARN page
  https://www.learn.ed.ac.uk
- IPP Piazza Forum - discussions throughout the course
  http://piazza.com/ed.ac.uk/spring2019/infr11147/home
- Wiki (materials for tutorials)
  https://www.wiki.ed.ac.uk/display/irrirpwiki/IRR+and+IPP+Wiki
- LaTeX/Overleaf Template
  https://github.com/bfranke1973/IPP-Template.git
- MSc Projects Website
  http://www.inf.ed.ac.uk/teaching/courses/diss/

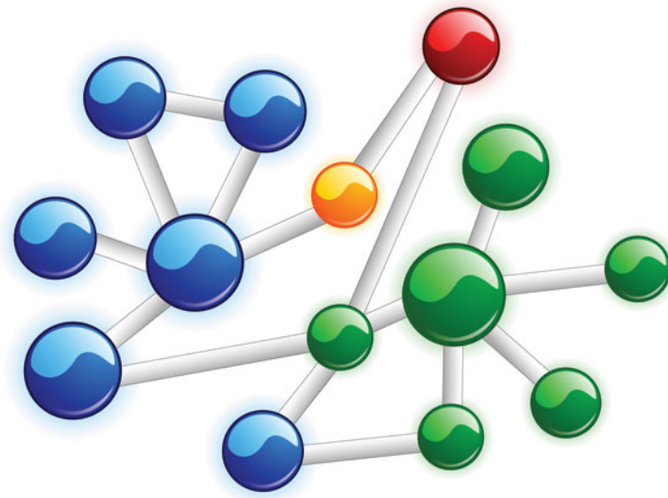
Technicalities



Report Template

- LaTeX/Overleaf template provided
  - Similar to IRR template
  - https://github.com/bfranke1973/IPP-Template.git
- Complete the relevant sections
- Adapt the research plan to fit your own project
- **Page limit: 8 pages**
  - Including references, but not including title page
- **Deadline: 10am on April 5, 2019**

Report Structure



- **Motivation**
  - Aims and objectives, hypothesis, timeliness, significance, feasibility, novelty, beneficiaries
- **Background** material (maybe derived from IRR)
- **Methodology** and techniques to be used
- Metrics for evaluation
- **Expected outcomes**
  - Insights, discovery, validation, …
  - application? experimental results? new data?
- **Research plan** (Gantt chart, milestones, deliverables)

- 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
- **Check with your supervisor!**

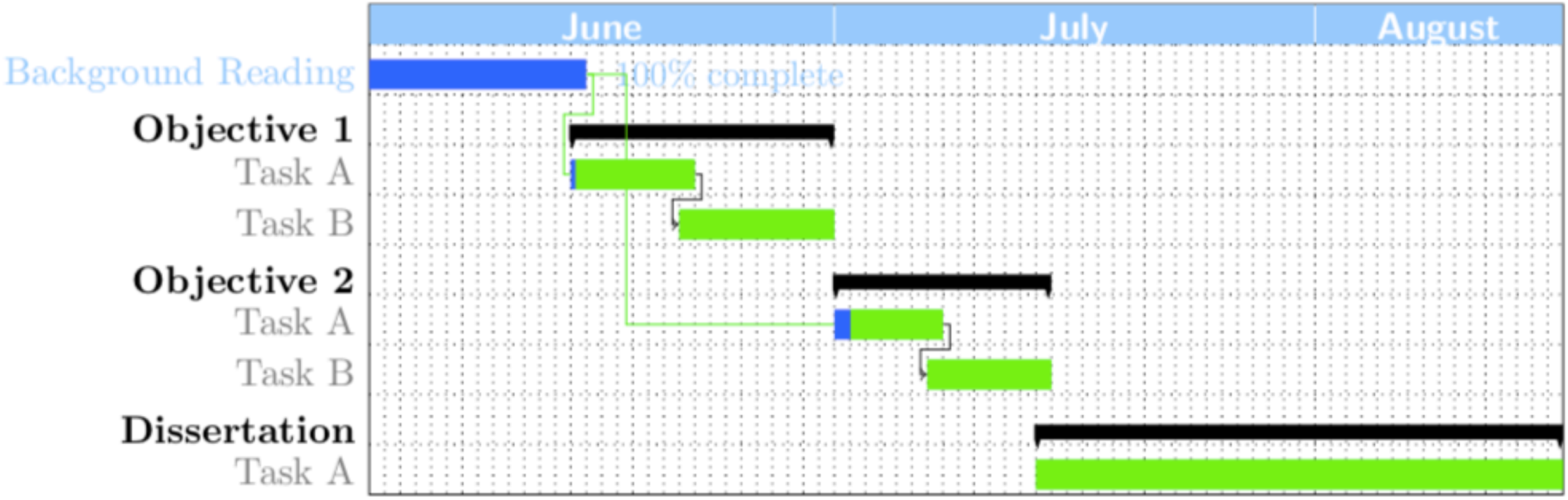
How will you evaluate your project?

- Think about : “When is this project successful?”
- A crucial part of the project (although 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 IPP) **one month for writing**.

Example Gantt Chart



Milestone	Week	Description
M_1	2	Feasibility study completed
M_2	5	First prototype implementation completed
M_3	7	Evaluation completed
M_4	10	Submission of dissertation

Deliverable	Week	Description
D_1	6	Software tool for ...
D_2	8	Evaluation report on ...
D_3	10	Dissertation

THE UNIVERSITY of EDINBURGH
informatics

Assessment

IPP Assessment

- Your report will be **jointly marked** by your IPP tutor (structure & writing) and project supervisor (technical content)
  - **Supervisor has veto rights** - stop you from continuing with the project even if you should pass IPP and also progress to the MSc dissertation stage
  - 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

Marking Guidelines

Criterion	Possible considerations	absent	poor	fair	good	v. good	excellent
Literature	Concise review of literature, correct referencing.						
Introduction	Accessible to non-experts; motivation and relevance; audience						
Objectives	Clear statement of objectives; hypotheses.						
Approach	Method; plan of work; evaluation metric; time-table.						
Presentation	Reasonable length, correct English, correct level						

Comments: Strengths (box)
Comments: Weaknesses (box)
Comments: Areas for Improvement (box)
Final Mark (numerical):

Basic Criteria

- **Essential criteria for passing IPP**
- 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

- Additional criteria for achieving a better grade
- 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

- **Quotations** must be acknowledged
  - Including close paraphrase
- Use **quote marks and cite source**
  …Smith(2009, p.138) argued that “the Level 2 cache systems are the core to fast database systems in future HPC”....
- **Do not copy-paste-edit** from online sources
- Read **School guide on plagiarism**
  - http://www.inf.ed.ac.uk/admin/ITO/DivisionalGuidelinesPlagiarism.html
- Plagiarism carries **serious penalties**. Fail on the course is the least severe…
- Guidance on **Good Academic Practice** on the course website

Consequences

- 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

THE UNIVERSITY of EDINBURGH
informatics

Re-using IPP in your MSc thesis

- The work but not the words of IPP can be used in thesis
- University policy: cannot be marked twice for the same work
  - Cannot copy-and-paste sections from IPP into your MSc dissertation
- Two options:
  - Quote the included sections with a citation to your own IPP. 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.


Useful!
Information

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: bfranke@inf.ed.ac.uk
  - For other problems: personal tutor. The earlier the better.
- Piazza forum!