

INDEPENDENT RESEARCH PROJECT (IRP)

IRP Instructions and Deadlines

Finding a project: A list of project titles will be circulated on 11th January 2019, along with the names and e-mail addresses of the supervisors. A brief description of each of these projects will be provided as soon as possible, thereafter. During the spring term you should contact supervisors to discuss projects with the aim of deciding which projects you are most interested in undertaking. Students are encouraged to steer their projects through discussions with potential supervisors. You will be asked to select three projects in order of preference; instructions on how to submit your preferences will be circulated closer to the deadline.

Project selection deadline 1st March 2019

Allocation of projects to students is overseen by the [Project Coordinator](#) who takes account of your indicated preferences. However, please note that allocation is an over-constrained problem: your first preference cannot be guaranteed, since individual supervisors can only take responsibility for a limited number of projects. We will endeavour to allocate everyone with one of their selected projects, but may have to ask for further preferences if that proves impossible.

We aim to finalise project allocations by 29th March 2019

Project plans (20%): The first task you will undertake for your IRP is to write a project plan, which should be ~5-6 pages long. This should include the project title and supervisors, the rationale and project objectives, a short literature review, proposed approach (an explanation of how you will achieve the objectives), list of milestones with a date for each deliverable, and a list of key references. You should discuss the milestones with your supervisor, which will be specific to your project and reflect the nature of the work that you will do. The following is a general example of milestones associated with a programming-oriented project:

- Review of Current Theory/State of the Art Completed
- Requirements Analysis
- High-Level Design
- First Prototype Program
- Specification of Testing Procedures
- Outline of Report
- Final Draft of Report

Some of your project objectives may have already been achieved by the time you submit your project plan. You will be told how to submit your Project Plans closer to the deadline.

Deadline for Project Plans is 4 pm on Friday 28th June, 2019

You will receive feedback from your supervisors on your project plans, which will be focused on providing guidance for the successful completion of your IRP.

Software (30%): Your project will involve the development or improvement of a major piece of software. As with all other coursework assignments, you will be assigned a private GitHub repository via GitHub classroom for you to submit your Final Report and software. Where possible (i.e., where permitted by licensing and IP restrictions), you should follow best practice in software development and use the GitHub repository to develop and host your software. In most cases, your code, **documentation (including installation instructions and user guide)**, test suites and any additional software infrastructure (e.g., issue tracker/wiki), should be maintained, archived and submitted for assessment via this GitHub repository. Please discuss cases where software cannot be hosted on GitHub with the Module Coordinator to agree a suitable method of software submission (for example, a working link to an alternative repository). As well as software functionality, the software will be assessed based on widely-used best-practice guidelines for software health and sustainability used to assess Group Projects (ACSE-4) and other coursework. The software constitutes 30% of the overall IRP mark.

Deadline for software submission is 4pm Friday 30th August, 2019

Report (40%)

Guidelines: Because all projects differ, it is hard to prescribe a particular structure for any report. The following is only a general guideline but points to elements that any report could contain.

Your report should start with a short **ABSTRACT** of < 300 words. Abstracts typically start with the rationale for the project and/or problem statement, and an explanation of the objectives of the project (what are you trying to solve/achieve), and then introduce the methodology that will be utilized, provide a short summary of the results, and end with a conclusion and any wider implications.

It should also contain a short **INTRODUCTION**. A good introduction “sets the scene” for the reader. It starts with an overview of the project research area, moves on to the current state-

of-play, and then ends with a statement of the aims and objectives of the project, and how you plan to achieve them.

It should also contain a **BACKGROUND RESEARCH** section. This might include a survey of relevant literature, programming methods or techniques, as well as any relevant discussion on different options that were available to you and a justification for any decisions that you will have made.

If a key part of your project is the development of a software product, then you will need to include sections describing the software engineering method that you followed and detailing the results obtained during the different development phases such as requirements analysis, design, implementation and testing.

If your project is mostly theoretical, then you should include sections detailing the development of your theory. This might include small programs to investigate certain aspects, explanations of algorithms, or descriptions of any particularly hard bits of theory. A theoretical project will probably have a section on results and some sections on their analysis.

If your project involves computational experiments with real-world data, you will need a section or sections on experimental results, analysis, and conclusions derived from the experiments.

Every report needs some kind of **CONCLUSION** and **SELF-ASSESSMENT** section including an appraisal of your effort: How did the project go? What did you do right/wrong? What have you learnt about planning and executing a project? Where might you go next?

A **BIBLIOGRAPHY** of all resources (books, articles, manuals) that you consulted to understand and develop the project should be included and properly cited in the text.

You may want to include one or more **APPENDICES**

The report should be around 20 pages long, not including any appendices. Pages should be numbered, please use a 12 point font, any figures or tables should be numbered consecutively and embedded within the text, every figure and table needs a caption, and the citations and references should be numbered. We recommend that you use the ACM formatting style, see: <https://www.acm.org/publications/authors/submissions>

The report is an extremely important part of the project. A distinction-level project will show clearly that you understand the broader context of the subject, and should cover some new ground, e.g., by developing a complex application that does not already exist, or by enhancing some existing application or method to improve its functionality and/or performance. The report should show that you are capable of evaluating and criticising your

own work objectively and making constructive suggestions for improvements or further work based on your experiences so far; and can explain your thinking and working processes clearly and concisely to third parties who may not be experts in the field in which you are working. Do not make the mistake of leaving the report to the last minute. Ideally, you should produce the bulk of the report as you go along and use the last week or two to bring it together into a coherent document.

Deadline for report is 4 pm Friday 30th August, 2019

The dissertation should be uploaded to your IRP GitHub repository as a PDF file, along with any attachments, such as supporting data, figures and movies. Note that your dissertation **must** be uploaded to your **IRP GitHub repository** even if you do not submit your software for submission via this repository.

Oral presentation (10%)

The culmination of the IRP will be an oral presentation of the project to all MSc staff, external examiners and industry partners. Each presentation will be allocated 20 minutes, and will include a 15 minute presentation and 5 minutes for questions. You should make about 15 slides, which should explain the objectives of your project, provide any necessary background, methodology, your results and achievements, and conclusions. You will be evaluated on how clearly you explain your project, the quality of your slides, the timing of your presentation (can you keep to the allocated time), and your response to questions. The presentation constitutes 10% of the overall IRP mark.

Oral presentations will be scheduled for early-mid September, 2019