DEPARTMENT OF COMPUTER SCIENCE

STUDENT HANDBOOK

Academic Year 2021/2022

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1 Welcome

Welcome to one of the youngest and most dynamic computer science departments in the country. The Department was founded in 1987 and currently has 30 full-time academic staff and an enrolment of over 1500 students. You are in the enviable position of embarking on a career in an area that is vibrant and exciting and in a department that is actively contributing to the development of the discipline in key areas of research (see our web pages at **https://www.maynoothuniversity.ie/computer-science**). Students at all levels are an integral part of the Department's dynamism, and we look forward to working with you to enhance further the development of the Department.

University education is a joint venture - we are here to facilitate your learning about the exciting fields of Computer Science, Software Engineering, and Information Technology - and you are here to learn (and also enjoy University life). You need to attend **all the lectures**, **all the laboratory sessions**, and **undertake independent study** if you are to do well. Work steadily throughout the year, and you will develop a good understanding of the subject, and should do well in the examinations.

If you have any questions about your course - then contact the Admin Office or the **Course Director** for your course. If you have any questions about your lectures or course material, you should ask in lectures/tutorials/labs, or go as soon as possible to your **lecturer** - it is important that you do not ignore things that you don't understand, but approach a member of staff for guidance.

The Department is located in the Eolas Building on the North Campus. The Admin Office, all Staff Offices, and some Computer Science Laboratories are in this building. The Department also has Laboratories on the ground floor of the Callan Building. Lectures take place at various locations about the campus.

We have a few **rules** relating to using the labs – see Section 8.3 - with large numbers of students accessing the rooms these are necessary to ensure that the rooms remain **safe and pleasant** for your use, and to ensure that you have access to the **Internet**. Abide by these rules – and we all benefit.

2 Admin Office

The Computer Science Admin Office is located on the first floor of the Eolas Building (Room 111).

The office is open from 9:00-1:00 and 2:00-5:00.

Contact information:

postal address: Maynooth University Department of Computer Science
Maynooth
Co. Kildare
email: **computerscience.department@mu.ie**
telephone: **(01) 708-3847**

3 Useful Dates

2021
Monday, September 20th - Semester 1 starts
Monday, October 25th to Friday, October 29th - Study Week
Friday, December 17th - Semester 1 ends

2022
Friday, January 7th - Semester 1 Exams
Monday, January 31st - Semester 2 starts
Monday, March 14th to Friday, March 18th - Study Week
Monday, April 14th to Friday, April 22nd - Easter Holidays
Friday, May 6th - Semester 2 ends
Friday, May 13th - Semester 2 Exams

4 Course Directors & Year Coordinators for 2021/22

4.1 Course Directors

1. Computer Science & Software Engineering: **Dr Charles Markham**
2. Computer Science in the following Programmes (Science, Arts and non-CS Denominated Degrees): **Mr Dermot Kelly**
3. MSc in Software Engineering : **Dr Kevin Casey**
4. Higher Diploma in Human-Computer Interaction & User Experience: **Dr Ralf Bierig**
5. Higher Diploma in Science (Software Development): **Mr Joe Duffin**
6. Music Technology: **Dr Joe Timoney**
7. Multimedia, Mobile and Web Development and Media Technology: **Mr Tom Lysaght**
8. Computational Thinking: **Dr Phil Maguire**
9. MSc Applied: **Dr Edgar Galvan**

4.2 First Year Coordinator

1st year Computer Science in all undergraduate programmes except Computational Thinking: **Dr Aidan Mooney**

4.3 Final Year Project Coordinator

Dr Liadh Kelly is responsible for organising the soliciting and assignment of final year projects for both the Science and Computer Science and Software Engineering undergraduate programmes.

4.4 Postgraduate Coordinator

The Coordinator responsible for the handling administrative matters relating to research postgraduates is: **Dr John McDonald**

4.5 Mature Student Academic Advisor

The Mature Student Academic Advisor is: **Dr Joe Timoney**

5 Staff Members

Head of Department	Room	Email
Dr Joe Timoney	117	joseph.timoney@mu.ie
Academic Staff		
Dr Ting Bi	105	ting.bi@mu.ie
Dr Ralf Bierig	134	ralf.bierig@mu.ie
Dr Stephen Brown	116	stephen.brown@mu.ie
Dr Kevin Casey	146	kevin.casey@mu.ie
Professor Rozenn Dahyot	110	rozeen.dahyot@mu.ie
Dr Dapeng Dong	105	dapeng.dong@mu.ie
Dr Tom Dowling	126	tom.dowling@mu.ie
Mr Joe Duffin	145	joseph.duffin@mu.ie
Dr Edgar Galvan	109	edgar.galvan@mu.ie
Dr Wu Hao	135	wu.hao@mu.ie
Dr Bryan Hennelly	E3.11	bryan.hennelly@mu.ie
Dr John Keating	143	john.keating@mu.ie
Dr Liadh Kelly	144	liadh.kelly@mu.ie
Mr Dermot Kelly	125	dermot.kelly@mu.ie
Dr Liadh Kelly	144	liadh.kelly@mu.ie
Mr Tom Lysaght	118	tom.lysaght@mu.ie
Dr Phil Maguire	108	phil.maguire@mu.ie
Dr Charles Markham	114	charles.markham@mu.ie
Professor Tim McCarthy	218	tim.mccarthy@mu.ie
Dr John McDonald	115	john.mcdonald@mu.ie
Dr Rosemary Monahan	127	rosemary.monahan@mu.ie
Dr Aidan Mooney	112	aidan.mooney@mu.ie
Dr Peter Mooney	136	peter.mooney@mu.ie
Professor Tom Naughton	107	tom.naughton@mu.ie
Dr Diarmuid O'Donoghue	122	diarmuid.odonoghue@mu.ie
Professor Barak Pearlmutter	132	barak.pearlmutter@mu.ie
Dr Guangyuan Piao	105	guangyuan.piao@mu.ie
Professor Ronan Reilly	105	ronan.reilly@mu.ie
Professor Adam Winstanley	104	adam.winstanley@mu.ie
Professor Damien Woods	343	damien.woods@mu.ie
Technical Staff		
Mr James Cotter	123	support@cs.nuim.ie
Mr Michael Monaghan	119	support@cs.nuim.ie
Mr Dave Hardman	121	support@cs.nuim.ie
Dr Vanush Paturyan	120	support@cs.nuim.ie
Admin Office		
Ms Phil Dully	111	computerscience.department@mu.ie
Ms Khalila Ismail	111	computerscience.department@mu.ie
Mr Des Noonan	113	desmond.noonan@mu.ie

6 General Information

6.1 Practical Assignments & Continuous Assessment

1. Continuous assessment is an important part of your course, and the marks contribute towards your end of year results. **Make sure that you do all the assignments**, and that your marks are correctly posted for all your continuous assessment (CA) practicals - query any missing marks; your CA marks are posted on Moodle.

2. It is important that you attend all your practical laboratory sessions. If you don't, then not only will you have a reduced continuous assessment result, but you also will miss out parts of the course, and will probably perform badly in the end of year examination. **Experience shows that poor lab attendance is almost invariably followed by failure in the summer examinations.**

3. **It is important to get good continuous assessment results**.

   If you have to repeat any examinations, the same continuous assessment result will count in the Autumn - so a low continuous assessment mark will require a correspondingly high examination mark in order to pass.

4. During the summer vacation, members of the Department may be consulted, by students who have failed the summer examinations, **only if they have had satisfactory attendance** at scheduled practical laboratory sessions, lab exams, and tutorials.

5. Note that the continuous assessment marks as posted are provisional and subject to review by the Extern and University Examination Board.

6.2 Medical Certificates

If you miss a scheduled practical session for medical reasons, then you should immediately (within one week) submit a medical certificate signed by a **medical doctor** (not a nurse) to the Admin Office by scanning and emailing a copy of the certificate to computerscience.department@mu.ie. You should also inform your lecturer in case you have missed an assignment due to a medical reason.

6.3 Using e-mail

1. All students in Computer Science are provided with email accounts by the University. Their use is subject to the Acceptable Usage Policy – refer to section 13.2 for details.

2. You will receive details of your email account during the first week of term.

3. You are expected to use these accounts - you will receive emails related to your courses and other Computer Science matters which you are expected to read.

4. Relaying email to other accounts you may have is not supported.

5. Please contact James Cotter (Eolas 123) if you do not know how to use your email account.

6.4 Login Accounts

All students in Computer Science are provided with Linux and Windows login accounts. Keep your password confidential.

If you do not know how to use your login account, please contact James Cotter (Eolas 123).

6.5 Computer Science Laboratories

1. You will be provided with a Computer Science username & password in one of your first laboratory sessions. You will need these during the year.

2. The Department of Computer Science has a number of Laboratories. They are provided for use by Computer Science students.

Eolas 003/004/005	Capacity 144, for use by all undergraduate students
Eolas 002	Capacity 48, for use by all undergraduate students
Lab 4 (Callan 1.105)	Capacity 99
Hardware Lab (Eolas 011)	26 workstations, for use in scheduled laboratories only
Postgraduate Teaching Lab (Eolas 019)	For use by taught MSc students only

Provision of the computer laboratories is very expensive, and represents a significant contribution towards your education - make the most of them!

3. The labs are generally available for independent study outside of scheduled lab times - you are encouraged to make use of this. Consult the timetables at the lab doors for details.

7 Health and Safety

Your health and safety are of paramount importance**. Make sure you are aware of the emergency exits to any building you are in.** Report any risks to your health and safety to the Department Office. Report any accidents to the Department Office. Obey directions from Security and other University Staff.

7.1 Fire Alarm

If the Fire Alarm sounds, leave the building immediately by the nearest emergency exit. Do not re-enter the building until told to do so by Security or a member of Computer Science Staff.

7.2 Emergencies

If an emergency of any kind arises, call the following number for assistance: **3333**

7.3 First Aid

The following list shows the First Aiders in the Department of Computer Science.

Name	**Office**	**Extension**
Vanush Paturyan	First Floor, Eolas, Room 120	4539
Tom Dowling	First Floor, Eolas, Room 126	4526

If you are unable to contact any of the above, contact Security at **3929** for assistance.

7.4 Security

To contact Security, call **3929**.

7.5 Other Issues

To report any other Health and Safety problems that arise, contact the Admin Office.

8 Regulations, Rules, & Procedures

1. Students in the Department of Computer Science are subject to the University Rules and Regulations – https://www.maynoothuniversity.ie/university-policies/rules-regulations-students

2. This is only a summary to help you understand what is required to succeed in the Computer Science courses.

8.1 Passing Examinations

1. You are strongly encouraged to achieve marks **well above the pass mark** - the rules and regulations determine the minimum requirements for passing a year. You should take the opportunity to excel.

   Think of it this way: 50% indicates that you only understand half the material!

2. In general, for students currently in undergraduate programmes:

   - You must pass (40%) your examinations (written, continuous assessment, lab exams, reports etc.) in order to proceed to the next year of the course.

   - Under some circumstances, when you have an overall pass mark, a 'pass by compensation' at 35% or above is allowed in individual modules.

   - For four year degree programmes, a combination of second, third and final year results determine the grade of your degree in the proportion 10:20:70.

   In summary, in order to pass a subject a student must:

   • Pass all required modules
   • Obtain 40% on aggregate in the subject
   • Pass modules to a credit value of at least half the credit value of the subject
   • Not fall below 35% in any module

   Further details on passing the examinations can be found on the Exams Office web site (https://www.maynoothuniversity.ie/exams) or by **contacting your course co-ordinator**.

8.2 Academic Problems

1. If you are having problems with the **material** do not hesitate to ask questions in tutorials, or approach a demonstrator in the practical sessions, or approach your lecturer.

2. If you are having problems with **academic life**, consult with your mentor, the Course Director, the Head of Department, or the Academic Advisory Office.

8.3 Use of the Computer Science Laboratories

1. Use the Computer Facilities responsibly. Refer to section 13 for more details.

2. To report any abuse of the computer facilities (such as offensive pictures, serious misconduct in the labs, damage to computer equipment etc.) send an email to **abuse@cs.nuim.ie** with the subject header '**ABUSE**'.

8.4 Plagiarism and Guidance for Students

It is recognised that nearly all assignments and essays draw on the work of others: published research and critical commentary, lecturers' notes and hand-outs, etc. The effective use and evaluation of existing

material are among the skills that students are expected to develop. Material is cited in order to contribute to a larger line of argument, or to be subjected to scrutiny, or to be combined with other material in order to arrive at new perspectives; in all cases, the source of the material (an idea or opinion, a quote, data, etc) must be acknowledged in a standard form of referencing.

Plagiarism is the passing off of another person's work as your own. It includes copying without acknowledgement from a published source (print or electronic), or from unpublished sources (e.g. another student's essay or notes).

Plagiarism also occurs when the substance or argument of a text is copied even with some verbal alterations, such as in paraphrase or translation, without acknowledgement. Plagiarism includes using material from books or periodicals, from the internet, from grind tutors, or from other students, without full acknowledgement of the sources.

Plagiarism in any form of assignment contributing to marks or a grade for a course is a serious offence. It is a form of cheating on several counts: the perpetrator is attempting to obtain credit for work not done, and is also attempting to benefit from work done by somebody else. Plagiarism undercuts the whole thrust of scholarly enquiry that is the essence of education. Plagiarism will be severely penalised wherever it is detected. Students submitting assignments, essays, dissertations or any form of work for assessment may be required to sign a declaration that the material in question is wholly their own work except where indicated by referencing or acknowledgement

Cases in which students knowingly permit others to copy their work shall also be subject to the procedures outlined here and considered an offence.

Disciplinary Consequences
Plagiarism is a form of academic dishonesty and will be treated with the utmost seriousness wherever discovered. Examiners, tutors and markers are required to report instances of suspected plagiarism to the relevant Course Director and/or Head of Department concerned.

Any student submitting written work for continuous assessment can be asked by the marker or the department to take a further test. This may take the form of an oral examination on the assignment in question and related issues, or the writing of a test paper in controlled conditions. In instances where a significant part, or all of an assignment, is found to be plagiarised, **zero marks may be awarded for that assignment. Cases in which students have knowingly permitted others to copy their work may also be awarded zero marks**.

Proven cases of plagiarism will be reported to the Head of Department and kept on record. In serious or repeated cases, the plagiarism will be **reported to the Supervisor of Examinations and the Committee of Discipline.** Plagiarism in postgraduate or research material is a particularly serious offence.

Penalties imposed may involve **suspension or expulsion** from the course and from the University, in addition to deduction of marks. See https://www.maynoothuniversity.ie/university-policies/rules-regulations-students for further details.

8.5 Programme Advisory Office

The Programme Advisory Office (PAO), within the Office of the Dean of Teaching and Learning, is available to advise you on any choices you might have to make related to your programme including subject choice. The Programme Advisory Office acts as a guide to students as you navigate your own way through your programme options. The Programme Advisory Office consists of the Programme Advisor, Caitriona McGrattan, who is supported by a team of PG students during peak times.

Incoming first year students are briefed by the Programme Advisor during Welcome Week about the programme choices you will be asked to make during your academic journey at Maynooth University. The Programme Advisory Team is available in person to answer any follow up questions students may have: details of times and location are available on the PAO website. Continuing second year students may also

avail of the service if you are unsure about your programme options for example if you have any questions about the difference in major/minor pathways or whether or not to choose to take an Elective.

The Programme Advisory Office can be contacted via
Email: **programme.choices@mu.ie**
Telephone: 01 474 7428
In person: please see their website for information about meeting a member of the Programme Advisory Team: **www.maynoothuniversity.ie/programme-advisory-office**

9 Modules & Lecturers 2021-2022

Module	Module Title	Semester	Lecturer
CS001	Computer Science	1	Prof Tom Naughton
CS130	Databases	1	Prof Adam Winstanley
CS144	Computer Systems	1	Dr Kevin Casey
CS161	Introduction to Computer Science I (x2)	1	Dr Aidan Mooney
CS162	Introduction to Computer Science II (x2)	2	Mr Joe Duffin
CS169	Introduction to Audio Technologies II	2	Dr Joe Timoney
CS171	Computer Systems I	1	Dr Charles Markham *et al*
CS172	Computer Systems II	2	Dr Kevin Casey
CS210	Algorithms & Data Structures 1	1	Dr Phil Maguire
CS211	Algorithms & Data Structures 2	2	Dr Phil Maguire
CS220	Computer Architecture 1	1	Mr Dermot Kelly
CS225	Introduction to Computational Thinking	1	Dr Phil Maguire
CS230	Web Information Processing	2	Dr John Keating
CS240	Operating Systems, Communications and Concurrency	2	Mr Dermot Kelly
CS261	Multimedia Technology	2	Dr Joe Timoney
CS264	Software Design	1	Dr John Keating
CS265	Software Testing	1	Dr Joe Timoney
CS280	User Experience (UX), User Interface (UI) & Interaction Design	2	Dr Ralf Bierig
CS310	Programming Languages & Compilers	1	Dr Edgar Galvan
CS320	Computer Networks	1	Dr Bryan Hennelly
CS321	Music Programming 1	1	Mr Tom Lysaght
CS322	Music Programming 2	1	Mr Tom Lysaght / Dr Joe Timoney
CS335	Software Engineering & Software Process	2	Dr Liadh Kelly / Dr Dapeng Dong
CS353	Team Project	1	Dr Kevin Casey
CS353C	Software Project	2	Dr John Keating
CS355	Theory of Computation	2	Dr Hao Wu / Dr Kevin Casey
CS356	Signal, Image and Optical Processing	1	Prof Tom Naughton
CS357	Software Verification	1	Dr Hao Wu / Dr Rosemary Monahan
CS362	Work Placement Documentation	2	Dr Joe Timoney / Mr Tom Lysaght
CS363	Industrial Work Placement	2	Dr Joe Timoney / Mr Tom Lysaght
CS370	Computation and Complexity	1	Mr Joe Duffin / Dr Joe Timoney
CS380	Multimedia Communications	1	Prof Adam Winstanley
CS385	Mobile Application Development	1	Dr Peter Mooney
CS401	Machine Learning & Neural Networks	1	Prof Barak Pearlmutter
CS402	Parallel & Distributed Systems	2	Mr Dermot Kelly
CS404	Artificial Intelligence & Natural Language Processing	1	Dr Diarmuid O'Donoghue
CS409	Artificial Intelligence Concepts & Machine Learning	2	Prof Ronan Reilly
CS410	Computer Vision	1	Dr John McDonald / Prof Rozenn Dahyot
CS416	Cryptography	1	Dr Tom Dowling
CS417	Numerical Computation	2	Dr Tom Dowling
CS422	Robotics & Automation	1	Dr Charles Markham / Dr John McDonald

CS423	Designing for Virtual Environments	2	Dr Ralf Bierig
CS424	Programming Language Design & Language Semantics	1	Prof Barak Pearlmutter
CS425	Audio & Speech Processing	2	Dr Joe Timoney
CS426	Computer Graphics	2	Dr Charles Markham
CS427	Autonomous Mobile Robotics	2	Dr John McDonald
CS430	Advanced Concepts and Issues in Computer Science 1	1	Dr Diarmuid O'Donoghue *et al*
CS431	Advanced Concepts and Issues in Computer Science 2	2	Prof Adam Winstanley *et al*
CS433	Advanced Computer Architecture	1	Dr Charles Markham / Dr Stephen Brown
CS434	Readings in the Foundations of Computer Science	2	Dr Joe Timoney *et al*
CS438	Research Methods	1	Mr Joe Duffin / Dr Stephen Brown
CS439	Ethical Implications of Human-Computer Interaction	2	Prof Ronan Reilly *et al*
CS603	Rigorous Software Development	2	Dr Rosemary Monahan
CS605	The Mathematics and Theory of Computer Science	2	Prof Tom Naughton
CS607	Requirements Engineering and System Design	1	Dr Diarmuid O'Donoghue
CS608	Software Testing	2	Dr Stephen Brown
CS610	Interaction Design	2	Mr Robert Cleary
CS613	Advanced Concepts in Object-Oriented Programming	1	Mr Robert Cleary
CS615	Internet Solutions Engineering	2	Dr Liadh Kelly
CS615C	Internet Solutions Engineering for Data Scientists	2	Dr Liadh Kelly
CS616	Practical Cryptography	1	Dr Tom Dowling
CS620C	Structured Programming	1	Dr Hao Wu / Dr Ting Bi
CS621B	Databases	1	Dr Peter Mooney
CS621C	Spatial Databases	1	Dr Peter Mooney
CS627B	Object-Oriented Programming	1 & 2	Mr Robert Cleary
CS629	Directed Reading	2	Dr Stephen Brown
CS631	Industrial Work Placement (DEPEND)	1 & 2	Dr Joe Timoney
CS632	Structured Programming for Data Analytics	1	Dr Hao Wu / Dr Ting Bi
CS633	Work Placement Preparation	2	Mr Joe Duffin
CS634	Workplace Preparation for HCI and UX	1 & 2	Mr Joe Duffin

Module Material on Course Finder - each module has its own web page – go to http://apps.maynoothuniversity.ie/courses/?TARGET=CS&MODE=SEARCH and enter the module code.

10 Course Information

All information about the structure of courses and individual modules is available on Course Finder: http://apps.maynoothuniversity.ie/courses/

Most modules have a Moodle page with detailed information on lectures, assignments, labs and exams: https://moodle.maynoothuniversity.ie/

10.1 Final Year Project

1. Students in final undergraduate year (except in Arts) complete a final year project as part of the course.

2. This provides you with an opportunity to carry out a non-trivial software project, and develop a significantly sized piece of software.

3. Most students be provided with a PC in the final year project lab Eolas 006. Discuss any special software requirements with your supervisor.

4. The Course Director will publish details of available projects, and also of project areas for student-proposed projects (including those resulting from your Industrial Placement). Talk to supervisors whose projects you are interested in, and then put your name down for the projects you prefer. Project assignment is done by the Department about a week into the first term – priority is given to students with the best results in 3rd year.

5. Organise a weekly meeting with your supervisor. Use this to keep your supervisor up to date with progress, discuss any problems with him/her, and listen to their guidance.

6. At the end of the project, you will make a presentation on your work, and submit a project report which will be marked.

11 Postgraduate Research Degrees

11.1 MSc & PhD

1. Postgraduate research students in the Department are assigned places in two purpose-built research laboratories in the Eolas Building. Contact the Head of Department if you have not been assigned a place or a PC when you arrive. In addition, a number of dedicated research laboratories contain specialist equipment. Contact your supervisor about getting access.
2. Contact Mr James Cotter to set up your email and login accounts.
3. Your supervisor is your first port of call if you have any questions, problems etc. You should talk to your supervisor about funding issues also.
4. You should organise regular meetings with your supervisor; keep your supervisor up to date with your progress.
5. You should produce an annual status report for your supervisor (and the Department's records). You may be asked to submit this to the Dean of Research and Graduate Studies if you are receiving Scholastic Funding from the University.
6. Postgraduate students are encouraged to publish in journals and conferences. Discuss this with your supervisor.

7. It is possible to change your registration from MSc to Ph.D or *vice versa.* Contact your supervisor to discuss the issues involved.
8. A separate research committee is formed for each student. The committee normally consists of three academic staff members from the Department: the supervisor, the supervisor's nominee, and the Head of Department's nominee.
9. Each research student is expected to give at least two research presentations in the Department each year. There are two seminar series to choose from: the Special Research Postgrad Seminar Series and the official Department Seminar Series.
10. Each student should set up a standardised web page with information such as title of research project, abstract, supervisor(s), expected completion date, and so on.

11.2 Staff Research Interests

Professor R. Reilly: Ronan Reilly's main research interests are in the areas of visual perception and language understanding. His interest in vision research primarily relates to eye movement control in reading, which also conveniently combines a language dimension. His research in this area involves data collection using an eye tracking system, and the computational modeling of these data. More recently he has started to look at the application of my reading model to web usability analysis. Within the language area, he has a specific interest in alternatives to the currently dominant nativist accounts of language acquisition. Again, this work is underpinned by computational modelling.
Prof. Reilly has also been working on a theoretical approach to modelling cortical computation, which he refers to as "Cortical Software Re-Use". The goal of this theory is to try to account for the construction of cognitive capabilities within a developmental and evolutionary framework. The main assumption of this line of research is that cognitive and linguistic capabilities are incrementally constructed from sensory-motor functions. These act as a repertoire of neural functionality that get exploited in the development of more complex neural capacities.

Dr S. Bergin (on career break): Susan Bergin's work includes project-management; software development; and machine learning and statistical analysis research-based projects.

Dr S. Brown: Primary research interest is in embedded networking systems: Sensor Networks, Software Engineering Education; Design and Analysis of routers/bridges for Performance and Stability, especially under overload; Engineering for Software Systems (Software Engineering); Embedded Operating Systems (especially support for latency, throughput, & buffering).

Dr T. Dowling: Theory and practice of cryptography and cryptanalysis. Information warfare. Java and perl based implementation of cryptographic protocol and systems. Smart card development and integration. Numerical computing. Developing computer based simulations of algebraic constructs. Theory and application of Elliptic curves over finite fields and extension fields. Performance analysis of elliptic curve algorithms. Computer forensics and network security protocols and tools.

Mr D. Kelly: Distributed Systems, the Internet and its application to the emergence of virtual societies, grid computing, e-commerce and database backed services, mobile internet services, multimedia delivery, collaborative applications, network centric games, virtual reality environments and remote monitoring and control. Entertainment Technology Systems for sound and lighting resources, analyzing and synthesising, visualising and controlling these resources.

Mr T. Lysaght: Digital signal processing with application to real-time audio. Sound synthesis. Computer vision.

Dr C. Markham: Charles Markham is currently collaborating with the Engineering Department at NUIM to develop a brain computer interface based on optical tomography. The work involves developing accurate methods of photometry to allow blood oxygen levels to be measured and so infer brain activity. In collaboration with the Vision Groups, Institute for Technology. Blanchardstown and NUIM Dr Markham is developing a mobile computer vision system. This project has created interest from the National Roads Authority for road infrastructure management. The Vision Group (NUIM) is also investigating the use of sensor fusion to improve performance of pedestrian detection systems. Initial work has been carried out using a combined LIDAR and Vision System as part of the autotram project. Dr Markham has special

interest in the design of novel imaging sensors. He has developed techniques for Infrared imaging using coded apertures and wide-baseline stereo imaging methods to achieve a visual radar system.

Dr A. Mooney: Aidan Mooney's research interests include digital watermarking with emphasis on digital chaos-based techniques.

Dr R. Monahan: Rosemary Monahan's research is concerned with the development of reliable software systems. In particular she is interested in the development of a mathematical model for object-oriented specifications and a corresponding program construction theory that will ensure that object-oriented software is designed in a precise unambiguous manner. Her main interests include formal methods for program construction (Refinement, the Z specification language, Weakest Precondition Calculus) as well as the exploration of the theoretical foundations of programming languages, with a particular emphasis on type systems and their impact on reliable software development.

Dr J. McDonald: John McDonald's primary research interests lie in the areas of computer vision, image processing, and pattern recognition. In the past he has worked on topics such as face recognition systems, 3-dimensional surface registration and analysis, and intelligent vehicle systems. More recently he has been involved in the development a novel computational model of facial expression and techniques for 3-dimensional holgraphic image processing. He is a member of the Computer Vision and Imaging Laboratory in the Department of Computer Science (vision.cs.nuim.ie).

Professor T. Naughton: Thomas Naughton has research interests at intersections of computer science, optics, and biology. In the field of optical information processing, he has developed tools for the processing and analysis of three-dimensional scenes encoded in digital holograms, has built matrix-algebra optical computers that utilise an optical Fourier transform, and has applied computational complexity theory to the analysis of analog optical computing architectures. At the intersection of computer science and biology, he is interested in biologically-inspired computation (genetic algorithms, neural networks), biocomputation (computing with molecules), and bioinformatics (for example, applying distributed computing to phylogenetic tree construction and genome database searching). In computer science, he is working on dynamic scheduling for distributed computing, and provably reliable operating systems.

Dr D. O'Donoghue: Diarmuid O'Donoghue's research is focussed on computational models of how people reason with analogical comparisons. He has been focusing on geometric proportional analogies, typified by those problems found in IQ tests. These analogies take the form A:B as C:D (read as, A is to B as C is to D), with the objective being to generate D from the given information (A, B and C).
We consider analogies where each of the objects include attributes, such as colour and shading. Solutions being developed combine (isomorphic) structure mapping between parts A and C of the analogy, with an attribute matching process - resulting in a family of structure matching algorithms. These algorithms are also being applied to the domain of qualitative spatial reasoning, particularly to interpreting and enhancing topographic maps. Other areas of interest include mathematical models of the web, genetic algorithms and simulated genetic-repair operators.

Professor Barak Pearlmutter: Prof. Pearlmutter's primary technical interest is in systems that adapt: how to analyze them, how to understand them, how to build them. Because the most flexible and competent adaptive systems available is the nervous system, he is interested in artificial neural networks and computational neuroscience. He is most focussed on the construction of novel architectures and algorithms that enable us to understand and attack previously unassailable problems, and to understand previously mysterious aspects of nervous system function.
A secondary interest of Prof. Pearlmutter's is in programming systems, especially advanced programming language design and implementation. One of his projects is to build a new efficient advanced programming language with novel constructs that allow many numeric algorithms and scientific computations to be expressed very clearly and succinctly.

Dr J. Timoney: Digital audio signal processing with an emphasis towards multimedia applications. Specifically, in the area of speech signal processing current projects include the development of a diphone speech synthesiser for Irish (Gaelic) and the investigation of post-processing methods to improve the synthesised speech. These are being carried out in collaboration with the members of the Department of Electronic Engineering. Additionally, a research group consisting of staff from the computer science department with researchers from DIT is creating new methods for the analysis of the partial envelopes of

musical sounds. Another project in collaboration with researchers from DIT is the development of ASIC technology to implement an adaptive filtering approach for speech enhancement.

Professor A. C. Winstanley: 1. A.I. and statistical approaches of graphical data including using shape, context, and statistical Language Modelling for recognition and validation of graphical objects.

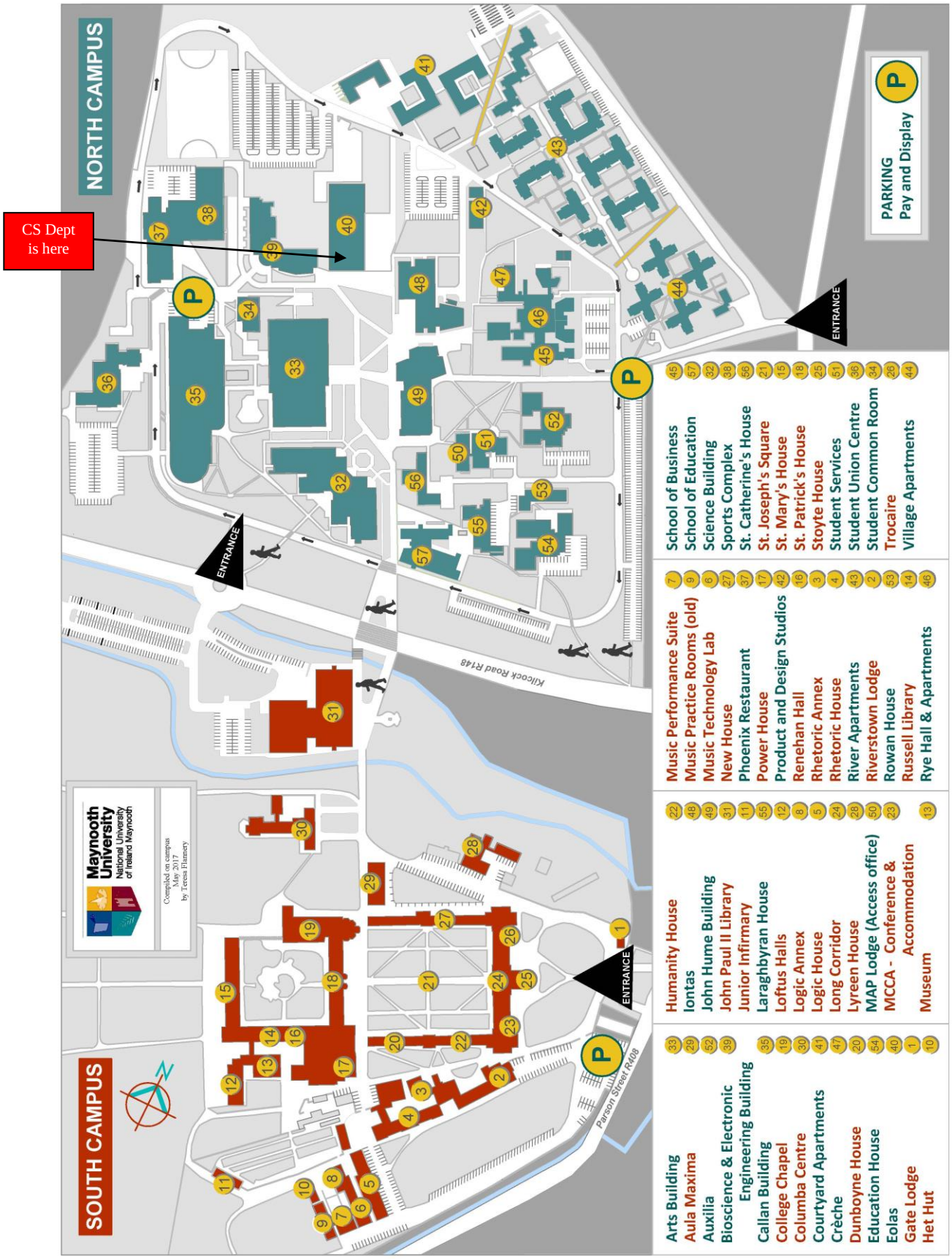
12 Timetable 2021 / 2022

The Computer Science timetables for the Academic Year 2021-2022 are available at https://www.maynoothuniversity.ie/computer-science/timetables

Please note that timetables are subject to minor changes, particularly early in the academic year, so check the web site for updates.

Appendix

Campus Map



Department of Computer Science - Code of Conduct

Relating to the Use of Computing Facilities in the Department of Computer Science at the National University of Ireland, Maynooth

To safeguard the standing of the University in the community, you are required to abide by the following rules in your use of Information Systems and Computing Facilities:

1. Respect the rights of the other users of these facilities, and the rights of others on the networks and facilities to which you gain access. Please remember that bandwidth and disk storage space are scarce resources.
2. Do not break the law.
3. Examples. It is a maxim of the law that ignorance of the law is no excuse: everyone is taken to know the law. If you publish an untruth which damages a person's reputation you are open to an action in defamation. Blasphemy, sedition, obscenity, harassment and incitement to racial hatred can constitute crimes. Breach of copyright, (such as by the unauthorised copying of programs or copyright images, music, graphics, or cartoons) can leave you open to civil and criminal liability.
4. Connection of any device (e.g. laptop) to the Computer Science network without written permission from either the Head of the Computer Science Department or the Computer Science Technical Staff is strictly prohibited.
5. In communications, do not use language inappropriate to the status and circumstances of the recipients or language inappropriate to the forum in which discussion is taking place.
6. Do not seek or obtain unauthorised access to the data of others, or infringe its integrity or confidentiality. The Criminal Damage Act, 1991 contains a provision which amounts to the proposition that to interfere without justification with data stored on a computer constitutes the crime of criminal damage.
7. Do not infringe the privacy of the communications of others.
8. Do not generate pornographic material in any way whatsoever.
9. Observe the rules imposed by any information systems facility or network that you use.
10. Computer games should not be played at any time.
11. Do not disclose your access password(s) to anyone. Do not allow anyone to access a University or Admin Information System or computer facility with your password, or to use your account for any purpose. You will be held responsible for any use to which your account is put.
12. Do not obstruct the use of rooms as teaching facilities. When a class is about to begin, vacate the terminal where this is necessary. Do not interrupt a class in progress. Follow instructions given by Members of Staff, or by Security, regarding use of the laboratories.
13. Observe any rules on behaviour or conduct, which are posted in the rooms containing the University or Department Information Systems and computer facilities.

NOTES

1) This Code of Conduct augments but does not supersede the "Code of Conduct for Users of Computing Facilities" as set out in the General Rules of the University in the NUI Maynooth Calendar.
2) Finally, these facilities are provided to help you learn - please use them and enjoy them.

HEAnet Acceptable Usage Policy

As a condition of use of the HEA (Higher Education Authority) networking facilities (which provide Internet access for email, WWW, etc. for you) all students must comply with the HEAnet usage policy.

Background and Definitions

1. HEAnet is the name given to the collection of networking services and facilities which support the communication requirements of the Irish education and research community.
2. HEAnet provides services to three categories of organisation - member, user and connected.
3. Member organisations are those organisations that have involvement in the management of HEAnet and form the Board of HEAnet. These are the seven Universities, the HEA, the ITs, DIT and the Government.
4. User organisations are those organisations that the Board has decided are eligible to subscribe for HEAnet services.
5. Connected organisations are those organisations that the Board has decided are eligible to connect to HEAnet. Such organisations are only allowed to connect to sites directly connected to HEAnet - i.e. they are not allowed to transit HEAnet into other networks.
6. This policy statement applies to all three categories of organisation. It is the responsibility of User Organisations to ensure that members of their own communities use HEAnet services in an acceptable manner and in accordance with current legislation.
7. Organisations using HEAnet should establish their own acceptable usage policies in a form that is compatible with the conditions expressed in this policy.
8. An organisation availing of HEAnet services is a user organisation. It is acceptable for a user organisation to extend access to others on a limited basis (subject to 9 below), provided no charge is made for such access.
9. A user organisation nuim provide HEAnet services to organisations which support the aims and objectives of HEAnet and which, in the opinion of the user organisation, have a contribution to make to the HEAnet community of members.
10. HEAnet nuim provide services to third parties (not members of HEAnet) provided that, in doing so, there is benefit to the membership of HEAnet.

Acceptable Usage

HEAnet services should be used in such a way as to:

- apply public funding only to the purposes for which it was voted;
- abide by the law of the land;
- and not conflict with or override the rules and regulations of member organisations.

HEAnet will actively seek grants, subventions and other assistance towards its aims and objectives from public and private sources as appropriate.

HEAnet Code of Behaviour

HEAnet provides enabling and enhancing services for member organisations in the pursuance of their official activities of instruction, research and development, and associated academic activities, and for administration in direct support of such use.

It is not permitted to use HEAnet services for any activity which purposely:

- seeks to gain unauthorised access to the resources of member organisations
- adversely affects the operation of HEAnet services or jeopardises the use or performance for other users
- wastes resources (people, capacity, computer)
- destroys the integrity of computer-based information
- compromises the privacy of users
- creates or transmits (other than for properly supervised and lawful research purposes) any offensive, obscene or indecent images, data or other material, or any data capable of being resolved into obscene or indecent images or material
- creates or transmits defamatory material
- transmits material in such a way as to infringe the copyright of another person or organisation
- transmits unsolicited commercial or advertising material
- causes offence or discriminates on grounds of race, creed or sex
- conflicts with practices as laid down from time by the Board
- contravenes the law of the State (in particular, but not exclusively, the Data Protection Act and the Criminal Damages Act(1991).

It is the responsibility of user organisations to restrict traffic according to their own requirements and to secure themselves against the misuse of HEAnet services.

It is the responsibility of the user organisation to take all reasonable steps to ensure compliance with the conditions of acceptable usage and to ensure than unacceptable usage of HEAnet services does not occur. The discharge of this responsibility must include informing all users of HEAnet services of their obligations in this respect.

Where necessary, HEAnet service may be withdrawn from the user organisation. This may take one of two forms:

- An indefinite withdrawal of service, should a violation of these conditions persist after appropriate warnings have been given by HEAnet. Such a withdrawal of service would only be made on the authority of the Board. Restoration would be made only when the Board was satisfied that the appropriate steps had been taken at the organisation involved to ensure acceptable behaviour in future.
- A suspension of service, should a violation of these conditions cause serious degradation of the service to other users. Such a suspension would be made on the judgement of the Board, and service would be restored when the cause of the degradation of service to others had been removed.

The responsibility for interpreting these terms lies with the Board. The Board reserves the right to review these conditions from time to time.

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