

Looking Forward

Strategic Plan 2021 to 2026

School of Computer Science

National University of Ireland, Galway

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1 Executive Summary

The newly established School of Computer Science is ambitious and growing. Our vision is to build a strong, respectful and sustainable learning environment with world-recognised research that informs highest-quality undergraduate and postgraduate teaching, that is relevant to the needs of our stakeholders and society in general. We are outward-looking and there are opportunities to attract more international students and research collaborations to our School, as Computer Science becomes increasingly important in the basic operation of our economy and society. Our strategy aligns with the four key values of Respect, Excellence, Openness and Sustainability that are emphasised in the University strategy, and our strategy is underpinned by the Strategic Plan published by the College of Science and Engineering.

Computer Science at NUI Galway: Where knowledge and imagination combine.

2 Key Facts and Background

Computer Science is widely acknowledged as one of the key enabling foundational disciplines that has underpinned the internet based economic revolution of our generation, and Ireland has been fortunate to establish itself as the European centre for many world-leading technology companies such as Google, Facebook, Amazon, Cisco and Apple, and home-grown success stories such as Genesys, Valeo and many others. Computer Science degree programmes typically include a range of subject areas from the theoretical studies of algorithms, computation and information to more practical areas such as programming, software engineering, cloud computing and data analytics. Computer Science graduates work in a wide array of interesting and diverse technology areas, there is high demand for Computer Science graduates, and they are employed in virtually every industry sector. The demand for graduates with these skills is set to increase over the coming years.

Our School of Computer Science at NUI Galway has demonstrated its agile capacity to grow and respond to market changes, having launched new postgraduate programmes every year for the past 5 years in topics such as data analytics, data visualisation and artificial intelligence. The School of Computer Science was established as Information Technology back in 1991, occupying the purpose-built IT Building since 2001. Since then, the School has grown considerably from being a Discipline within the College of Engineering and Informatics, to being a separate School within the College of Science and Engineering (since 2019), with staff and students in the IT Building and in the DSI Building. In particular, the School has rapidly expanded its number of taught postgraduate programmes in recent years, responding to market need for skilled graduates in areas such as Artificial Intelligence,

Machine Learning and Data Analytics. This has led to the continued expansion of the School, including key metrics like staff numbers, additional taught programmes and students numbers.

Even in the difficult academic years 2019-2021, the School of CS increased its Postgraduate Taught numbers by 33% and now accounts for 50% of all non-EU PGT students in the College of Science and Engineering. As a result, in 2020/21, we have more than 650 FTE students, and we have repeatedly demonstrated our capacity to grow. The School is continuing to expand its academic staff numbers, in line with growth in its income and to enable future growth in research and teaching. Current staff and student numbers and the academic programmes that are run by the School, or where the School is a key contributor, are shown below:

- 74 staff (excluding ICHEC & part-time teaching support staff)
 - 27 academic staff
 - 7 admin & technical staff
 - 40 research staff
- 680 FTE students approximately in 2020-21
 - Increase of approx. 70 FTE from 2019-20 to 2020-21
 - ~150 FTE PhD students (approx. 40 DSI, 60 rest of CS, each 1.5 FTE)
 - ~190 Postgrad Taught FTE
 - ~340 Undergrad FTE
- Principal undergraduate programmes:
 - GT350 BSc Computer Science & Information Technology
 - GY101 Information Technology subject in BA
- Key contributors to other undergraduate programmes:
 - GY406 (Electronic & Computer Engineering)
 - GY301 (Science - Computer Science pathway)
 - GY124 (BA Arts with Data Science)
 - GY125 (BA Digital Arts and Technology)
 - GY133 (BA Education - Computer Science & Maths Studies)
- Postgraduate taught programmes:
 - HDip Software Design & Development
 - HDip Software Design & Development (Industry Stream)
 - MSc Software Design & Development
 - HDip Data Analytics & Visualisation
 - MSc in CS Data Analytics
 - Postgrad Diploma in CS Data Analytics

- MSc in CS Artificial Intelligence
- MSc in CS Artificial Intelligence (Online Part-time)
- MSc Software Engineering & Databases
- Postgrad Diploma in Software Engineering
- Postgrad Certificate in AI for Managers

We have developed excellence in a number of key areas of Computer Science today, such as Artificial Intelligence and Machine Learning. Academic staff in the school are very active in research and we continue to collaborate with other research institutes both in NUIG and abroad. Examples of such collaborations include:

- Ryan Institute, School of Medicine, Marine Institute
- World Health Org (NUIG/CS is a member of the Global Outbreak Alert and Response Network)
- Centres for Research Training: CRT-AI; D-REAL CRT; Genomics Data Science
- DSI is a member of SFI Research Centres including Insight, VistaMilk, ADAPT, LERO and CONFIRM

In particular, we have a very strong linkage with DSI, as almost all staff in DSI are members of the School of CS, and many other academics in the School work closely with DSI and are actively involved in DSI research projects. We also collaborate with a range of other disciplines, from Health to Energy, and we excel in applying Artificial Intelligence and Machine Learning to problems in such diverse areas. It is our mission to be a leader both in Ireland and further afield in interdisciplinary computer science research. A benefit is that we strongly encourage a research-led approach to learning and teaching and we will also strive to support the excellence and sustainability goals of the College of Science and Engineering through our research activities.

3 Our Mission and Values

Given the key role that Computer Science and Information Technology plays in all aspects of our lives, we believe that we have a duty to develop and use Computer Science for the benefit of society as a whole. A key part of this mission must be that we contribute to achieving Sustainability Goals in everything we do, being involved in research projects and teaching that have a lasting positive impact. Employment trends indicate that Computer Science has been, and will continue to be, an important driver of employment and new industry. We will continue to engage strongly with industry, contributing to our young people's employment prospects in our region through research and teaching that adapts to the needs of society and industry. In tandem we are extremely active in promoting Computer Science as an attractive career choice for all.

Galway is a unique place, with unique strengths in its location, diversity and culture. We strive to contribute to that rich environment, by developing programmes that are unique to Galway and engage in societally and culturally relevant teaching and research. We strive to be a positive example, promoting respect and diversity in all areas, including staff and students. While Galway itself is an attractive location for students to come to study, we strive to provide an excellent student experience through our programmes.

None of the above is possible without the full support and commitment of the staff in all areas from administrative to academic, research and support. It is our mission and responsibility to support staff professional development and be a highly desirable place to work for all grades of staff, providing sufficient opportunities and mentorship, while promoting work-life balance. Our most important core value is to put respect for people and diversity front and centre, we strongly support the related goals of the College of Engineering and Science to ensure fair treatment and equal opportunity for all.

4 Our Vision and Ambition

As stated at the start of this document, our vision in the School of Computer Science is *to build a strong and sustainable learning environment with world-recognised research that informs highest-quality undergraduate and postgraduate teaching, that is relevant to the needs of our stakeholders and society in general.*

The following general aims for the School were among those identified during our initial consultations:

- Provide a strong and sustainable learning environment
- Engage in internationally recognised and impactful research activities
- Have active research groups collaborating with one another
- Grow the school to 40 academic staff with 1000 FTEs
- Have a strong international profile, high in relevant rankings
- Be one of the top ranked CS schools in Ireland
- Achieve diversity targets in both staff and students
- Have more female staff in leading positions
- Maintain contact with alumni to encourage future collaborations
- Foster stronger partnerships with industry and other key stake holders
- Provide flexible choices for students to study Computer Science
- Foster a respectful and inclusive workforce

The School has developed and refined these aims, leading to the set of goals and actions that are identified in the following sections.

5 Goals and Objectives

Based on our vision for the school, the following goals and objectives have been identified. The actions required to achieve these goals are outlined in the next section.

Goal ID	Details	Related Functions	Priority
G1	Grow our programme portfolio, including more flexible choices	Education	High
G2	Attract more female students to our programmes	Education, Marketing	High
G3	Improve quality and innovation of our existing programmes	Education	Medium
G4	Improve student experience	Education	Medium
G5	Create an alumni network for each academic programme	Marketing	High
G6	Improve outreach activities aimed at second level stakeholders	Marketing	High
G7	Improve understanding of student course selection and motivation	Marketing	High
G8	Improve visibility and recognition of the School of CS name	School	Medium
G9	Identify new markets as a key driver for medium term growth	Internationalisation, Marketing	High
G10	Attract high quality undergraduate international students	Internationalisation	Medium
G11	Continue to grow number of high quality international students at PGT level	Internationalisation	High
G12	Identify new programmes and modules for online delivery	Internationalisation	Medium
G13	Enhance research and related activities within the school	Research and Graduate Studies	High
G14	Enhance graduate student experience within the school	Research and Graduate Studies	High
G15	Enhance the School's overall rating in the next IRRP review	Research and Graduate Studies	Medium
G16	Foster a respectful and inclusive workplace	EDI	High
G17	Have a diversified staff profile	EDI	High

6 Action Plan

The following table is the list of actions (mini-projects) needed to achieve our goals. These are SMART (specific, measurable, achievable, relevant, time-bound) actions that will be operationalised and resourced as required by the School management. We recognise also that the University and the College of Science and Engineering has committed to align all major efforts and targets with the United Nations (UN) Sustainable Development Goals (SDGs), including through our education, research, leadership, operational and engagement activities. We fully support these efforts and we will ensure that the actions resulting from this plan are, where applicable, aligned with these goals.

Action ID	Details	Related Goals	Responsibility & Resources	Timeframe	Success Criteria (KPIs)
A1	Design and undertake market analysis for a proposed new denominated UG degree in the area of <i>Computer Science and European Languages</i>	G1, G2, G10	E&S Committee New Programme Board	AY 2021/22 through to launch of the new programme	16 first year students (at least 50% female) in year 1 of a new denominated “CS and European Language” degree, with a total student cohort of 80 students, with at least 50% female, after 4 years
A2	Design and undertake market analysis for a proposed new MSc degree in <i>Computer Science (Negotiated Learning)</i> with flexible module selection	G1, G2, G9, G11	E&S Committee International Committee New Programme Board	AY 2021/22 through to launch of the new programme	20 students in the first cycle rising to 40 after three years, with a target of 50% from within Ireland and 30% from new international markets
A3	Introduction of a flexible choice model for GY350 where students can choose elective modules from another year, or programme	G1, G3, G4	E&S Committee GY350 Programme Board	AY 2022/23 and later years	GY350 students can pick 10 ECTS per annum via the flexible choice model

A4	Create and maintain an Alumni network for all CS programmes on LinkedIn	G5	Programme Directors	AY 2021/22 and later years	Each programme has an alumni network and 10% of graduating students have joined their respective network by October 2022
A5	Create a 2 nd Level CS Community network leveraging 2021 Virtual Summer Camp participants	G6	Marketing Committee	AY 2021/22 and later years	Second level CS community network setup with 10 schools participating by June 2022
A6	Improve engagement with professional marketing support at college and university level	G7	Marketing Committee	AY 2021/22 and later years	Metrics are available on student course selection motivation and marketing activity impacts by 2023
A7	Rename the IT Building and related signage and maps on campus	G8	School Head	AY 2021/22	Building has a new name for AY 2022/23
A8	Recruit two additional academic staff members	G1, G13	School Head	AY 2021/22	Successful recruitment of staff with teaching and research aligned to our goals
A9	Develop an Undergraduate International Promotion Strategy	G10	International Committee	AY 2021/22 and later years	Grow international student numbers to 5% of total undergraduate student numbers
A10	Develop a strategy to expand to new markets for international PGT recruitment	G9, G11	International Committee	AY 2021/22 and later years	Grow international PGT student numbers and increase international student diversity across all PGT programmes

A11	New Massively Online Modules	G11, G12	International Committee	AY 2022/23 and later years	Launch one MOOC by AY 2023
A12	Increase staff participation in university research institutes	G13	Director of Research & Graduate Studies	AY 2021/22 and AY 2022/23	50% of staff aligned to the research institutes by 2023
A13	Enhance visibility of PhD researcher's activity in the school	G14	Research & Graduate Studies Committee	AY 2021/22	Annual Thesis in Three competition, launched in April/May 2022
A14	Generate a portfolio of research impact case studies	G15	Director of Research & Graduate Studies	AY 2022/23 and later years	A portfolio of 2 to 3 case studies showing the impact of CS research on society
A15	Complete Athena Swan Bronze application	G16	Athena SWAN SAT Team	AY 2021/22	Successful Application
A16	Make application to SALI scheme	G17	School Head EDI Director	AY 2021/22	Application selected at university-level
A17	Appoint a search committee for each new recruitment campaign to focus on widening the pool of applicants	G17	School Head	AY 2021/22 and later years	Increased recruitment from targeted groups