A message from Professor Cormac Sreenan, Head of School

Welcome to our latest newsletter! We are now in the middle of the pleasantly warm summer and while the recent examination period is behind us, the School remains a hive of activity. This summer we have about 80 MSc students, each working on an individual research-oriented project that is supervised by a member of our academic staff. The School has been especially successful in attracting research grants, from SFI, the EU and industry, and while progress is made throughout the year, for the academic staff it is during the summer months that they get to set aside dedicated time for exploratory work. One can hear the busy hum of activity as one walks around the laboratories!

Preparing and grading the repeat examinations is next on the list, not to mention devising and updating lecture material for the Autumn semester which will be here before we know it.

This year we are also ramping up to launch our two new undergraduate degrees starting in September. Both of these emphasise the true interdisciplinary nature of computer science, and will be offered jointly with the UCC Department of Statistics and the UCC School of Applied Psychology. We look forward to welcoming a broad spectrum of students to our School and trust that they will find the new degrees both innovative and industry-relevant.

Computer Science in 2018 and beyond

The School of Computer Science and Information Technology (CSIT) is currently going through a growth phase in terms of new programmes, student numbers (FTE’s) and staff. 2018 will see the introduction of two new interdisciplinary degrees 1) BSc Data Science and Analytics (jointly offered with the Department of Statistics and 2) BA Psychology and Computing (jointly offered with the Department of Applied Psychology). In September 2017, the School was delighted to welcome four new academic staff members: Dr Aisling O’Driscoll, Dr Klaas-Jan Stol, Dr Paolo Palmieri and Dr Ahmed Zahran. Best wishes are also extended to Professor Jim Bowen and Mr Tom Lenihan on their retirement.

Computer Science at UCC is very attractive to international students. In 2017-18 there were around 60 international students, mainly from India and China, taking our MSc programmes and a further 19 students in our undergraduate programmes, many of which are enrolled via our international partners.

Computer Science PIs’ are very proud to be involved in two new national research grants: 1) ENABLE, a new Science Foundation Ireland Spoke on Smart Communities involving collaboration with CONNECT, Lero and Insight and 2) Confirm Centre for Smart Manufacturing, a newly funded SFI Centre.

CSIT plans to be a national leader in cyber-security, establishing it as a core competency, recruiting new staff, including a Professor, which will enable the School to work with cyber-security companies nationally and internationally. In addition, areas of multimedia and human-computer interaction will be clustered to achieve critical mass and build capacity, underpinning the introduction of the BA Psychology and Computing.

CSIT prides itself in ensuring our facilities are state of the art and has over the past three years replaced PC’s and iMacs in all of our teaching labs ensuring students have the best experience possible. In summer 2018, it is planned to create a bigger teaching lab to cater for growing student numbers which will also include upgrading computers and software.

Computer Science have an ever expanding secondary (three levels) and primary school outreach programme under the banner of Munster Programming Training. In 2018, over 100 students from schools all over Munster took part, culminating in a graduation ceremony in May. In addition, in June 2018, the school ran two summer camps for Junior and Senior Cycle secondary pupils.

The introduction of Computer Science as a leaving certificate subject in 2018 is long awaited; the School has reached out to the designated schools and is working to help them during the establishment phase. This development is welcomed and will set the foundations for the advancement of Computer Science at third level in the coming years.

In 2018, the school will undergo a quality review and invites your views and comments.
Dr Aisling O’Driscoll

I’m very happy to be joining the School and look forward to engaging with you all over the coming years. My research interests are in communication and network management protocols/systems, primarily for wireless networks (vehicle to everything (V2X) protocols), although not exclusively.

In 2004, I graduated with a BSc in Software Development and Computer Networking from Cork Institute of Technology (CIT) as well as a Cisco Certified Networking Associate (CCNA) Industry certification which I had obtained during my third year placement. I was offered the opportunity to undertake an MEng by research in the Adaptive Wireless Systems Group, a research team based in the CIT Department of Electronic Engineering. As I thoroughly enjoyed my final year project (building a SIP based SDK) I decided this was the route for me. This research, in conjunction with a local SME and funded through Enterprise Ireland Innovation Partnership Programme, addressed passive VoIP QoS measurement and modelling by analysing RTPC communications. Towards the end of my MEng I applied to the Irish Research Council under the Embark Initiative for funding to support PhD studies. This was successful and I commenced a PhD in the CIT Nimbus Centre of Embedded Systems. Enthusied by the prospect of undertaking something new and not yet blighted by the time-related pragmatism that PhD students develop in later years, I decided to move down the network stack to undertake a PhD at the Network/MAC layer. My PhD centred on the development of robust V2X geo-routing and location service protocols.

Within the broad spectrum of my remit (bioinformatics, cloud and large scale data management), I identified an opportunity to link those fields and led research in parallelised distributed software pipelines using frameworks such as MapReduce and Spark for solving applied bioinformatics problems. This involved the redesign of existing bioinformatics software pipelines (a field still in its infancy) and/or proposal of new pipelines to provide scalable data processing of Next Generation Sequence (NGS) data in the cloud. In one FP7 funded project, the developed pipeline identified 6 new pathogens linked to sepsis in neonatal babies, an impact I am particularly proud of.

During my time in CIT, I published 19 peer-reviewed articles in journals and international conferences with one paper listed in the International Medical informatics Association (IMIA) Yearbook 2014 as one of the best articles of the year in the fields of Big Data and Health science. I was awarded €740k in competitive research funding (direct awards) as well as infrastructure funding via an AWS research grant ($20k). Funding sources included EU FP7 (ClouDx-i project), Teagasc (Walsh Fellowship), IRC (Embark Initiative), UCC APC Innovation Platform and the CIT RISAM programme. During this time, I was made a member of adjunct faculty in the UCC Alimentary Pharmabiotic Centre (APC).

In this time, I also became a Cisco Certified Academic Instructor (CCAI) and a Certified Cloudera Developer for Hadoop (CCDH). I was an external examiner on 2 x MSc CS programmes (DIT (2013-2016) and Dundee University (2014-2017)) as well as a QQI reviewer on a number of NCI accreditation panels. In October 2016, I was awarded a student led National Teaching Hero award by The National Forum for T&L and in 2015 an interdisciplinary MSc course for which I was Computing coordinator won the GradIreland Postgraduate Course of the Year. Finally, I was also involved in numerous outreach initiatives e.g. I Wish, committees such as the IT@Cork TechTalks and on several occasions was an invited speaker as Industry Fora panelist.

Deciding it was time for a change and wishing to focus more on self-directed research in the field of networking and communications, I joined the UCC academic staff in August 2017. I have subsequently joined the SFI CONNECT centre as an Associate Investigator. I am on the steering committee for the formation of a national Connected Autonomous Vehicle (CAV) testbed led by Jaguar Land Rover (JLR) and will soon be assuming the UCC directorship for IT@Cork.

Most of my research work in cyber security focuses on cryptography, privacy and anonymity. My research interests include secure computation, privacy-enhancing technologies, anonymity protocols, and smart cities. Currently, I am working on location privacy. We don’t often think about our current location as sensitive information, but as our lives become increasingly connected and we rely more and more on smart digital devices, location-tracking can become a very sensitive issue. A number of applications and services (such as Facebook, Google and Twitter) constantly monitor our whereabouts. But where we are, can tell a story about who we are: our political or religious affiliation (if we attend a political gathering or a religious service), our social lives (who we meet in our free time), and even our health (when we are admitted to a hospital or visit a GP). It is therefore important to protect location information, and keep it private. My research contributions in this area include the design of a number of cryptographic protocols specifically targeted at communicating location information, so that we can keep using all the apps we love, without having to worry about our private information.

I published more than 20 peer-reviewed articles in journals and international conferences, and I am a member of the programme committee of the International Workshop on Secure Internet of Things (SiOT), and the International Workshop on Malicious Software and Hardware in the Internet of Things (Mal-IoT). I have published with more than 10 co-authors based in different countries and institutions, and I have active research collaborations in Europe and beyond: I am an External Associate at the Smart City Lab of the Università di Bologna (Italy), and I have research links with: Columbia University (USA), where I visited in February 2016; AlAri (Switzerland), where I was invited to speak in April 2015; TU Delft (The Netherlands) as well as my alma mater Université catholique de Louvain (Belgium), among others. I am also a Fellow at the Higher Education Academy (HEA), United Kingdom.

Dr Paolo Palmieri

I am a Lecturer in Cyber Security, and I joined the School of Computer Science and IT in September 2017. I earned my Ph.D. in Cryptography in January 2013, at the Crypto Group of the Université catholique de Louvain (Belgium). I then moved to Delft University of Technology (The Netherlands), where I was a post-doctoral researcher for 2 years, working on privacy-enhancing technologies. Before joining UCC, I was a Lecturer in Computing at Bournemouth University (2015-16), and a lecturer in Cyber Security at Cranfield University (2016-17), in the United Kingdom.

Most of my research work in cyber security focuses on cryptography, privacy and anonymity. My research interests include secure computation, privacy-enhancing technologies, anonymity protocols, and smart cities. Currently, I am working on location privacy. We don’t often think about our current location as sensitive information, but as our lives become increasingly connected and we rely more and more on smart digital devices, location-tracking can become a very sensitive issue. A number of applications and services (such as Facebook, Google and Twitter) constantly monitor our whereabouts. But where we are, can tell a story about who we are: our political or religious affiliation (if we attend a political gathering or a religious service), our social lives (who we meet in our free time), and even our health (when we are admitted to a hospital or visit a GP). It is therefore important to protect location information, and keep it private. My research contributions in this area include the design of a number of cryptographic protocols specifically targeted at communicating location information, so that we can keep using all the apps we love, without having to worry about our private information.

I published more than 20 peer-reviewed articles in journals and international conferences, and I am a member of the programme committee of the International Workshop on Secure Internet of Things (SiOT), and the International Workshop on Malicious Software and Hardware in the Internet of Things (Mal-IoT). I have published with more than 10 co-authors based in different countries and institutions, and I have active research collaborations in Europe and beyond: I am an External Associate at the Smart City Lab of the Università di Bologna (Italy), and I have research links with: Columbia University (USA), where I visited in February 2016; AlAri (Switzerland), where I was invited to speak in April 2015; TU Delft (The Netherlands) as well as my alma mater Université catholique de Louvain (Belgium), among others. I am also a Fellow at the Higher Education Academy (HEA), United Kingdom.
College Cork (UCC), Ireland. I hope that the following highlights my background and experience before joining the academic staff at UCC.

Born to be an engineer, I studied Electronics and Electrical Communications engineering at Faculty of Engineering, Cairo University. As a top student in year 2000 class, I was offered a scholarship at the same university for MSc studies. My MSc thesis focused on ensuring the quality of service in Bluetooth networks. I then moved to the north-western part of the world after getting a fully-funded scholarship to study my Ph.D. at University of Toronto, Canada. That was a four-year rich experience at both personal and professional levels. My research focused on mobility management and modeling in heterogeneous wireless networks, where users are able to use different technologies (e.g., WiFi and cellular) as they move in the network. This research was done in collaboration with Bell mobility, Canada. Additionally, it received a couple of awards including the best paper award in IFIP networking 2005 and a student travel grant to ICC 2006. While I was pursuing my graduate studies, I also worked as a teaching assistant for a wide variety of courses including programming and computer networks.

After finishing my Ph.D. in 2007, I joined the Mobile and Internet System Laboratory as a postdoctoral researcher. I spent 3.5 years working on two different projects focusing on optimized media streaming in heterogeneous systems and enabling efficient data delivery over remote cellular networks with satellite backbone. The latter project was conducted in collaboration with Altobridge Ltd. and received the UCC commercialization award in 2010. Furthermore, my paper on media streaming in heterogeneous networks was selected as a spotlight paper for IEEE Transaction on Mobile Computing in its June 2010 issue. In addition to my research, I had the chance to co-lecture a couple of graduate modules and supervise a couple of MSc theses.

In 2011, I moved back to Egypt where I worked as an assistant professor at Cairo University. I also worked as an adjunct assistant professor at Nile University. At both institutions, I taught many courses at both graduate and undergraduate levels. I supervised 14 MSc students with most of them going on to pursue their Ph.D. studies at highly ranked universities in North America. I also co-supervised two Ph.D. students at UCC. My main research tackled three key areas including media streaming, cognitive radio networking, and wireless sensor networks. This research was supported by the national telecommunication regulation authority of Egypt, Science Foundation Ireland, and Qatar Foundations.

In 2014, I moved back to the Mobile Internet System Laboratory as a research fellow on the iVID project. In this project, my research focused on developing novel solutions to improve the user streaming performance in wireless networks. These solutions are developed in collaboration with partners from AT&T Research and The University of California, Riverside. This research received different awards including the Best Demo Award, LANMAN 2016 and the first Excellence in DASH Industry Forum Award at ACM MMSys 2017.

To date, I have published 13 articles in prestigious journals, more than 50 conference papers, and 1 patent. I have also served as a technical reviewer for many IEEE and ACM journals and conferences. Additionally, I have also served as a technical program committee member of various conferences and workshops. I am also proud that I have helped many graduate students to establish their research career while pursuing their MSc or Ph.D. degrees. I am looking forward to leveraging the experiences I have gained for the benefit of UCC, Cork, and Ireland.
Data Science and Analytics is changing the world, not only in business; it also influences policy, is used extensively in advertising, insurance, logistics, media & communications, sports and medicine etc. In fact, it is difficult to find an area in the modern world that is not influenced by some aspect of data science and analytics.

The challenge for data analytics is to interpret large volumes of data from different sources to provide information that can be used in decision making. For example, supermarket loyalty cards collect vast amounts of data on a daily basis from shoppers which they use for stock control, stock placement, advertising and special offers. The skills required to understand the data encompass both computer science and statistics expertise.

The job opportunities for data scientists/analysts is endless with salaries amongst the highest in the field. According to a recent salary survey (Morgan McKinley) salaries for newly qualified data scientists/analysts are in the region of €50,000; this rises sharply within 5 years.

Not only are the salaries very attractive, but Data Science was reported to be the best job in the US according to Glassdoor (https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQG.20.htm). In the same survey, data engineers were rated number 3 and analytics managers as number 5 - three of the top 5 jobs will be filled by graduates with data science and analytics skills.

The reason data analytics is so pervasive, is that data is being generated constantly - most of the time you are not conscious that your behavior is generating information for advertisers, government, business etc. As soon as you connect a device to the internet, every time you go shopping, every time you travel etc. data is generated.

The positive impact of data science and analytics can be seen in the medicine, sports, and fraud analytics to mention but a few. In medicine for example, it can be used to assist in-patient scheduling, provide information on disease outbreak threats, for individual treatments of patients etc.

Businesses are also willing to pay companies such as Google, Facebook, Amazon etc. for data and use it to make business decisions. This information can be used to deliver advertising directly to you based on your behavior when connected.

Sports enthusiasts will know that an athlete’s performance is monitored in minute detail; from the tracking of individuals during training to producing individual training plans aimed at optimising performance. Analytics is also used by managers to help make decisions on team selection and purchasing of players.

In today’s world, if a company does not take advantage of analytics there is a strong possibility it will get left behind. As a consequence, analytics is revolutionising business practice. It has also become pervasive in social interactions through social media, e.g. Facebook, YouTube, Twitter etc.

Due to the success of the MSc in Data Science and Analytics, UCC will introduce a BSc in Data Science and Analytics starting in September 2018. The first cohort of students in the new four-year degree programme will produce graduates that are sought after both nationally and internationally. Details of the programme can be found on https://www.ucc.ie/en/ck411/.

The BA in Psychology and Computing is a joint degree programme designed to provide students with the knowledge and skills to work in the rapidly-expanding fields of User Experience and Interaction Design.

High-tech companies are increasingly concerned that their products should not only be useful but also easy and pleasurable to use. To this end, they need graduates with skills in both digital technology and human psychology - people who can assess the needs and preferences of end-users and then design and build systems to meet those needs. This course not only provides a solid grounding in both computing and psychology but also seeks to integrate the two disciplines by showing how psychological principles can be applied to the design of interactive systems.

User-experience designers are employed in an ever-increasing range of industries. Almost every device used in our daily lives - cars, home entertainment systems, domestic appliances, industrial equipment, as well as smart-phones, computers, tablets, etc. - incorporates digital technology, and manufacturers are anxious to ensure that their products are not only useful and well-engineered but also easy and enjoyable to use. In addition, it’s important that they can be used by a wide range of people, including those who may have special needs (such as a visual impairment). Designing systems and services that can be used by everybody requires an in-depth knowledge of human psychology and the techniques that can be used to gather and assess data needs of potential users. Thus, User Experience engineers are employed in almost every sector - the automotive industry, IT, telecommunications, entertainment, media, education, local and national government agencies, and many more.

Until recently there were few undergraduate programmes covering both computing and psychology. Most user-experience professionals studied one or other subject at first degree level and then acquired additional skills/knowledge through post-graduate study or on-the-job training. However, increasing demand from industry has led to an acute shortage of people with these skills. At the time of writing, there are hundreds of job adverts on https://www.jobs.ie/ and other recruitment sites requiring skills in user experience or related disciplines (Interaction Design, Usability Engineering, Human Factors Design, etc.). In addition, a number of surveys have shown that employers are finding it difficult to recruit graduates with the right mix of skills. We hope that this new course will go some way towards addressing this shortage whilst offering graduates a chance to work in a challenging and well-paid field. For further information on the new BA Psychology and Computing see www. https://www.ucc.ie/en/ck121/.

INTRODUCING TWO NEW UNDERGRADUATE PROGRAMMES
NEW RESEARCH FUNDING

Enable

The School of Computer Science and Information Technology is delighted to be part of ENABLE, a new Science Foundation Ireland research programme. Professor Ken Brown and Professor Cormac Sreenan are the UCC Principal Investigators. The programme, which was launched in January 2018 in Dublin, aims to connect communities with smart urban environments through the Internet of Things (IoT). In collaboration with industry partners and via citizen engagement, it will address the challenges that currently limit the potential benefits of IoT for communities.

ENABLE’s academic researchers will work in partnership with over 25 companies including large multinationals such as Intel and Huawei, and SMEs such as Cork-based Accuflow. The ENABLE research programme will address a wide range of topics including water management, air pollution, transport congestion, data privacy and cyber security. It will receive €10 million from Science Foundation Ireland and a further €4.5 million through collaborative research agreements with industry partners.

CONFIRM Centre for Smart Manufacturing

CONFIRM is one of the newly funded SFI Centres. Computer Science staff involved in the Centre include Professor Barry O’Sullivan, Professor Ken Brown and Dr Steve Prestwich.

CONFIRM aims to transform Ireland’s manufacturing industry to become a world-leader in smart manufacturing. The manufacturing sector is the second largest employer in Ireland and accounts for €110 billion in exports. Smart manufacturing optimises production systems, adding intelligence and enhanced information technology. These new technologies will be at the heart of the factories of the future, increasing product line adaptability, enabling real-time decision making, shortening supply-chains, and speeding up the development of new innovations to produce higher-quality goods at reduced costs across all industry sectors. CONFIRM will be revolutionary for Irish manufacturing competitiveness, delivering the technological advances and expertise for a smart manufacturing innovation ecosystem, enabling companies to compete within the rapidly changing global landscape, and boosting Ireland’s reputation as a leading international manufacturing location. http://www.sfi.ie/sfi-research-centres/confirm/

STAFF MOVING ON

Professor James Bowen

James Bowen retired in 2017 having joined UCC as Professor of Software Engineering in 1993.

As Head of Department, Jim leveraged the first national ICT skills initiative which led to a doubling of the BSc intake and corresponding allocation for new staff. He also advocated diversification in our degree offerings, especially in the area of multimedia - the MSc is still with us and consistently popular. Jim’s research area is constraint programming and in 2001 he merged his research group with that of Professor Gene Freuder to form 4C, which has had a major impact on the School’s research profile, and more recently evolved into Insight Centre for Data Analysts at UCC. Prior to joining UCC Jim was at North Carolina State University and the University of Reading. In his retirement Jim plans to spend time on his boat and hone his sailing skills.

Dr Simon Foley

Simon has been appointed as Directeur de Recherché (Cybersecurity) at Institut Mines-Télécom/Télécom Bretagne in Rennes, France. Before his departure, Simon was Statutory Lecturer in Computer Science at University College Cork, Ireland where he currently holds an adjunct position. Prior to joining UCC he was at Odyssey Research Associates (US) and Cranfield IT Institute (UK) and has held visiting posts at University of Cambridge (UK), IBM (US) and SRI International (US).

The school of Computer Science and Information Technology wish Simon well in his new position.

Tom Lenihan

Tom Lenihan retired earlier this year having joined UCC in 1981 as a Technician, subsequently being promoted to Chief Technical Officer. Tom played a key role in the development of hardware-related laboratories, notably in designing bespoke platforms for students learning about embedded systems and multi-processor environments. Over the years, Tom supported a wide array of hardware activities including courses on computer architecture and digital multimedia. An avid musician, Tom plans to continue playing traditional music during his retirement.
Professor Barry O’Sullivan was elected as a member of the Royal Irish Academy in May 2017; https://www.insight-centre.org/content/prof-barry-osullivan-elected-member-royal-irish-academy

Professor Barry O’Sullivan. He is named UCC’s Researcher of the Year 2017. The accolade is one of many for Professor O’Sullivan. He was named as Science Foundation Ireland’s Researcher of the Year in November of last year.

Professor Ken Brown and Professor Cormac Sreenan are PI’s on the ECSEL/EU H2020 project SCOTT: Secure Connected Trustable Things, which started in May 2017.

Professor Emeritus Eugene Freuder of Insight@UCC has been elected to a three-year term as Councillor of the Association for the Advancement of Artificial Intelligence.

Professor Ken Brown was chair of the Applications Track at CP2017 (The 23rd International Conference on Principles and Practice of Constraint Programming), held in Melbourne, Australia, in August 2017.

Mike O’Keeffe’s work on a real-time public transportation map of Cork City using Open Data has been included in the Cork Smart Gateway.

Professor Barry O’Sullivan is an Associate Editor of JAIR, the Journal for Artificial Intelligence Research, the top journal in the field of artificial intelligence.

Professor Barry O’Sullivan has been invited to join the Judging Panel of the IBM Watson AI XPRIZE competition. This is a $5 million competition, challenging teams globally to develop and demonstrate how humans can collaborate with powerful AI technologies to tackle the world’s grand challenges. The top three finalists will compete for the Grand Prize at TED 2020. http://ai.xprize.org/

UCC Insight Student Committee hosted the 4th Insight Student Conference in the Western Gateway Building in UCC on Sept 8th 2017. Over 100 posters and 24 talks were presented over 3 sessions with each session having 2 parallel tracks.

Dr Derek Bridge was a keynote speaker at WebMedia 2017 in Brazil, where he presented a talk entitled “Explaining Recommendations: Fidelity versus Interpretability”.

Dr Aisling O’Driscoll for receiving funds for a PhD scholarship within the CONNECT Research Centre. Her proposal on communication for connected vehicles was very highly ranked during the competitive review process.

Dr Paolo Palmieri was awarded the School of Computer Science and Information Technology PhD award to fund a student for four years.

Dr Klaas-Jan Stol was co-author on a book Adopting InnerSource, published by O’Reilly in June 2018.

Professor Barry O’Sullivan has been named as one of Ireland’s Tech 100 by Business and Finance Magazine. The Business & Finance Tech 100 recognises the top 100 people working across some of the tech scene in Ireland, and abroad. Professor Michel Schellekens and PhD student Patrick Egan were awarded a Fulbright Scholarship and TechImpact Irish Scholar Award 2018-19.

Professor Cormac Sreenan and Dr Ahmed Zahran awarded United States patent for their invention that improves the speed of internet downloads within cellular and satellite systems.

Dr Marc van Dongen was awarded a gift of $3,200 from Intel Corporation for functional programming with application to FPGA programming.

Dr Ahmed Zahran, Dr Jason Quinlan, Dr K.K. Ramakrishnan, Professor Cormac Sreenan MMSYS 2017 Excellence in DASH Award.

Best papers, awards, demonstrations


- Hebrard E., Siala M., Explanation-Based Weighted Degree, In proceedings of Integration of AI and OR Techniques in Constraint Programming, pp 167-175, June 2017, Padova, Italy. International constraint programming solvers prize.

In today’s world, it is common for any person (end-user) with a smart phone to make a Voice-over-Internet-Protocol (VoIP) call, use the mobile video conferencing application or browse the Internet any time they want. A person using the smart phone for such activities can have a satisfying experience when the network service provider can provide intelligent quality of service (QoS) between applications of different priorities, given a bandwidth-congested network infrastructure.

For example, let us assume that a person in UCC is making a VoIP call to his/her friend in the USA using his/her smart phone connected to an LTE service provider. Here the data traffic that originates at the phone for the VoIP call, first reaches the LTE Base Station (BS) outside UCC wirelessly, and then travels across the wire from the BS towards the central office of the LTE network operator in Ireland, before going via the transatlantic communication cables to reach the USA. From the Irish LTE network operator’s point of view, there would be thousands of people in Cork making VoIP or video calls using their smart phone with many more using the same wired and wireless network to browse the Internet or access the social media at the same time. Given such a scenario, a network operator in Ireland (or anywhere in the world) should be aware of the QoS efficiency of the combined wired and wireless network infrastructure. In fact, if the QoS capabilities of such a complex network can be known before making a large-scale deployment of this new technology, a network operator in any country will be able to ensure a satisfying service to all its users all the time.

LTE and 10-Gigabit Passive Optical Networks were two newly standardised technologies at the time I started my PhD in 2012 in UCC. While LTE promised to be a popular wireless technology XG-PON, due to its high bandwidth capability, proved to be a promising wired network for connecting BS and central offices. However, a scientific proof for the effective QoS experienced by a smart-phone application when using the integrated LTE - XG-PON network was a major research vacuum. So in my PhD, I simulated an integrated network of both LTE and XG-PON and developed efficient QoS algorithms for the simulated network, to validate the QoS capabilities of the integrated network for VoIP, video-conferencing and Internet-browsing applications. My results also ensured the QoS standard-compliance for hundreds of simultaneous mobile-phone applications under realistic network conditions.

Having successfully completed the PhD in 2016, under the expert supervision of Prof. Cormac Sreenan and Prof. Kenneth Brown, I joined Trinity College Dublin as a Post-doctoral Researcher, for a short stint. Today, I am a Senior Research Engineer at the OSRAM Innovation division in Munich. In OSRAM, I am constantly looking to push the boundaries of the technical understanding as well as the overall product capabilities regarding light (optical) -based wireless communication, so that very soon, an affordable smart phone will be able to make a VoIP call by connecting to the light bulb in the ceiling (instead of connecting to an LTE BS). Isn’t that wonderful for an imagination?
PhD CONFERRING

Congratulations to our PhD students who were conferred in 2017 and to date in 2018. The School of Computer Science and Information Technology wish each of them well in their future careers.

<table>
<thead>
<tr>
<th>PhD Graduate</th>
<th>Year</th>
<th>Thesis Title</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamara Vagg</td>
<td>2018</td>
<td>Virtual Reality, Gamification and Mobile Multimedia for Cystic Fibrosis Education and Management.</td>
<td>S. Tabirca, B. Plant</td>
</tr>
<tr>
<td>Josephine Griffith</td>
<td>2018</td>
<td>An analysis of collaborative filtering datasets.</td>
<td>H. Sorensen</td>
</tr>
<tr>
<td>Ultan Neville</td>
<td>2017</td>
<td>Reasoning about firewall policies through refinement and composition.</td>
<td>B. O'Sullivan, S. Foley</td>
</tr>
<tr>
<td>Stefan Meyer</td>
<td>2017</td>
<td>Matching distributed file systems with application workloads.</td>
<td>J. Morrison, B. O'Sullivan</td>
</tr>
<tr>
<td>Donnchadh Coffey</td>
<td>2017</td>
<td>Enhanced e-learning and simulation for obstetric education</td>
<td>S. Tabirca, R. Green</td>
</tr>
<tr>
<td>Chavalit Likitvivatanavong</td>
<td>2017</td>
<td>Domain value mutation and other techniques for constraint satisfaction problems.</td>
<td>J. Bowen</td>
</tr>
<tr>
<td>Olgierd Pieczul</td>
<td>2017</td>
<td>Analysis and detection of security vulnerabilities in contemporary software.</td>
<td>S. Foley, J. Herbert</td>
</tr>
<tr>
<td>Barry Hurley</td>
<td>2017</td>
<td>Exploiting machine learning for combinatorial problem solving and optimisation.</td>
<td>B. O'Sullivan, K. Brown</td>
</tr>
<tr>
<td>Hazzaa Alshareef</td>
<td>2017</td>
<td>Mobile cloud healthcare systems using the concept of point-of-care.</td>
<td>D. Grigoras, C. Sreenan</td>
</tr>
</tbody>
</table>

SEFS Quercus postgraduate scholarship awardees
- Ashwini Iral Barboza – MSc Data Science and Analytics
- Dhanya Jayachandra – MSc Data Science and Analytics
- James McCleane-Fay – MSc Data Science and Analytics

SEFS Quercus undergraduate scholarship awardees
- Tim Creedon – BSc Computer Science
- Ina Panayotova – BSc Computer Science
- Noel Bourke – BSc Computer Science
- Gary Greer – BSc Computer Science

SCHOLARSHIP AWARDEES

MSc DSA awardees: Ashwini Iral Barboza, Professor Cormac Sreenan, Dhanya Jayachandra

Undergraduate awardees: Tim Creedon, Ina Panayotova, Professor Cormac Sreenan, Noel Bourke, Gary Greer.
Niamh Lyons awarded prize for fourth year project at international conference

My name is Niamh Lyons and I have just completed my BSc degree in Computer Science at UCC. I was fortunate enough to recently have had the opportunity to present my final year project at the LIDA (Libraries In the Digital Age) conference in the University of Zadar in Croatia alongside a number of undergraduate and postgraduate students from all over Europe. The goal of the LIDA conference is to examine how information systems & services and libraries have to adapt in the changing digital world; it welcomes entries for both poster and paper presentations as well as guest speakers who discuss various relevant topics in information science.

My project was a mobile application for the iOS platform which facilitates a digital link between charities and people in a community context; this allows the process of donating items to become more quick and efficient as well as creating more awareness of local charities and what they do. My project fell under this year’s LIDA theme of community engagement and inclusion so I submitted an abstract in early February describing my project with an aim to present it as a poster. Within a few weeks, I was delighted to receive positive news from the organisers of LIDA that my poster submission had been accepted.

I travelled to Zadar in mid-June where I attended LIDA for 3 days. The poster session was held on the first day where I, along with 13 other undergraduate and postgraduate students, presented my project in front of all of the attendees. Everyone was then invited to visit our poster stands to ask us any further questions about the work we did. Three professors from different universities, including Rutgers University in New Jersey, were judges for the poster session and they each asked very interesting questions about the background of my project.

For the next two days, I attended several fascinating talks on a variety of topics relating to the theme of information accessibility in different types of communities. There was also a number of extra activities organised for attendees, such as a tour of Zadar as well as a boat trip to nearby islands following the close of the conference. All of these events provided great opportunities to speak with people from universities all around the world and learn more about what their research entails.

At the closing ceremony, Dr. Ross Todd, professor in the Library & Information Science Department at Rutgers University, presented the awards for best posters from the poster session. I was delighted and honoured to be awarded second best poster at the conference. I received a certificate at this ceremony and Dr. Todd then said a few words about my project. It was a true privilege to receive this award and is something that I will always remember.

I was very proud to represent UCC at an international conference like this and I would like to thank my supervisors, Humphrey Sorensen and Cathal Hoare, for their guidance during the course of my project. I would also like to extend my gratitude to the School of Computer Science at UCC for all of their help in organising my trip to LIDA. Attending this conference was an amazing opportunity to learn about the work of so many talented people and it was a truly memorable way to finish my time at UCC.

Eimear Crotty – success after success

Eimear Crotty, a 2017 BSc Computer Science graduate, made the headlines in UCC and now making the headlines in Google where she is working since graduating.

Eimear won the 2017 Fidelity Most Innovative Software Engineering Project award presented by Fidelity Ireland at the fourth-year project open day. Her project was entitled ‘Implementing and Augmenting New Distributed and Parallel Algorithms’ and investigated how large scale distributed storage systems can emulate fault-tolerant atomic storage in a variety of ways. The project aims to present two algorithms and, using new experimental data, compare their performance and subsequent costs. The ABD algorithm uses a replication-based approach to this problem, incurring high storage costs to ensure resiliency, while the SODA algorithm implements erasure codes to drastically lower this storage cost.

On 31st March 2017, two of our Computer Science undergraduates, Catherine Bowen (Second Year) and Eimear Crotty (Fourth Year) were awarded Quercus Scholarships, based on the results of their exams from last year. The standard for these awards is extremely high so this is an impressive achievement.

On behalf of all the staff in Computer Science, University College Cork, we are very proud of our high achieving students and wish them hearty congratulations. Eimear was also runner up SEFS Graduate of the Year 2017 and received her prize in March 2018.

Colm Cahalane
2017 graduate, Colm Cahalane was runner-up award in the Peel Memorial Prize, 2017; he received his prize in March 2018.

Professor Paul Ross, Head of College, SEFS presenting Eimear Crotty with runner up SEFS Graduate of the Year 2017 award.
**SAD LOSS**

It is with immense sadness that we remember two fourth-year students who passed away since the beginning of the academic year. Our deepest sympathy to their families and friends.

**Gregorz Ikwanty**, who was from Timoleague / Clonakilty passed away after a short illness in September 2017.

**Denise Crowley**, from Headford, Kerry, died as a result of a road side accident in December 2017.

---

**Event Highlights**

**Munster Programme Training (MPT)**

**Junior**

Over 30 pupils 13 - 14 year olds took part in 16 week course from November 2017 to March 2018.

**Munster Programme Training (MPT)**

**Senior**

The Senior course was attended by 60 second level pupils from transition year and above.

**Munster Programme Training (MPT)**

**Cycle 2 and Cycle 3**

This is an advanced programme for MPT Students interested in honing their programming and problem-solving skills and who wish to compete in both the national and international Olympiad.

**MPT Kiddo**

Kiddo was an introductory programme for primary school pupils, over 30 children attended and learnt to programme, develop an App gaming with Kodu.

**Irish Collegiate Programme Competition March 2018**

UCC’s ACM Student Chapter hosted the eighth annual Irish Collegiate Programming Contest (IrICPC) on Saturday the 10th of March 2018, sponsored by Insight Centre for Data Analytics, Google, and Poppulo.

**Fourth Year Project Open Day – 11th April 2018**

The Open Day provides fourth year students with an opportunity to demonstrate the skills they have acquired during their studies to both staff and industry. Location Western Gateway Building, UCC.

**IT summer camp, sponsored by HEA**

The School of Computer Science and Information Technology held two summer camps (Junior and Senior) in June 2018 attended by 60 pupils from all over Munster.

---

**Computer Science in Action**

- CS staff enjoying social gathering.
- Graduating members of the 2017 Higher Diploma in Applied Computing Technology.
- Dr Sabin Tabirca, HEA summer camp director and some of the participants.
- Class of 2017.
- CS staff taking part in offsite School review.
- Final year students 2017 gathering after conference in KMUTT Thailand, where they presented their fourth-year project.