University College Dublin
School of Computer Science

MAY 2022

CS NEWS

EXPLOITING THE POTENTIAL OF EARTH OBSERVATION DATA

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WELCOME

A MESSAGE FROM THE HEAD OF SCHOOL

Welcome to issue two of our magazine bringing the latest news from around the School to our students, alumni, collaborators, staff, friends, and the worldwide computer science community.

In this issue, we highlight the *CAMEO* project, led by Michela Bertolotto, which is establishing a new national repository for satellite images of Ireland together with a set of software tools for analysis of the data. The project received €9 million in funding from the Department of Enterprise, Trade and Employment and industry sources.

Professor Barry Smyth explores the world of Wordle, the hot new word game obsessing puzzle fans globally. Barry employs big data techniques to analyse Wordle players' performance and to test the best game playing strategies.

The School's SFI-Defence Organisation Innovation Challenge projects are featured. *FireFly* aims to develop an online decision support system to enhance aerial firefighting. *MENTOR* seeks to harness machine learning and virtual reality to provide more effective and environmentally sustainable pilot training.

The staff spotlight is on Catherine Mooney as she takes on the role of College of Science Vice Principal for Equality, Diversity and Inclusion. The research centre profile is on the Centre for Cybersecurity & Cybercrime Investigation.

In research news, we are involved in UCD's exciting new centre for quantum computing, C-QuEST. We received funding for 3 IRC funded Coalesce projects researching anti-immigrant sentiment in Ireland, the impact of policy measures on migrants, and the proliferation of false information on social media. The SPATIAL project is enhancing accountability and resilience in edge computing and privacy-preserving AI. The School's latest spinout, recsyslabs, is commercialising an AI tool that automatically tailors newsletter content to individual subscribers based on their interests.

On the education side, there's an update from the Advance Centre which offers courses for professional learners. Congratulations to Henry McLoughlin who received the Great Wall Friendship Award from the Beijing Municipal Government in recognition of his outstanding contributions to education in Beijing. Finally, we catch up with our student interns and alumni.

Many thanks to the editorial team of Rupert Bowen, Léan Ní Chléirigh and Colm Ryan. Enjoy!

Chris Bleakley, Head of School

RESEARCH CENTRES

Science Foundation Ireland For what's next

Science Foundation Ireland Research Centres
UCD CS researchers are active in several SFI Research Centres, which link scientists and engineers in partnerships across academia and industry to address crucial research questions.
See: www.sfi.ie/sfi-research-centres/

Insight

Insight – data analytics
High-impact research in data analytics, with significant benefits for the individual, industry and society. See: www.insight-centre.org/

LERO Software for a better world

LERO – software
Bringing together expert software teams from universities and institutes of technology in a centre of research excellence with strong industry focus. See: www.lero.ie/

ADAPT – AI-driven digital content technology
Pioneering new human-centric AI techniques and technologies including personalisation, natural language processing, data analytics, intelligent machine translation, and human-computer interaction. Setting standards for data governance, privacy, and ethics for digital content. See: www.adaptcentre.ie/

CONNECT

CONNECT – future networks and communications
World-class expertise from ten Irish academic institutes creating a one-stop-shop for telecommunications research, development and innovation. See: www.connectcentre.ie/

VistaMilk

VistaMilk
Innovative precision pasture-based dairying for the environment, animal well-being and the health of consumers. See: www.vistamilk.ie

future neuro

FutureNeuro – chronic and rare neurological diseases
Improving the health and healthcare of people with neurological disease through diagnostics, therapeutics and eHealth research.
See: www.futureneurocentre.ie/

I-Form Advanced Manufacturing Research Centre

I-Form – advanced manufacturing research centre
Shaping the future of manufacturing through high-impact research into the application of digital technologies to materials processing.
See: www.i-form.ie/

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EXPLOITING THE POTENTIAL OF EARTH OBSERVATION DATA

CAMEO project receives funding from the Disruptive Technology Innovation Fund (DTIF).

Earth Observation (EO) data is being collected at unprecedented rates. As a member of the European Space Agency and the European Organisation for the Exploitation of Meteorological Satellites, Ireland has access to vast amounts of data. While several Irish organisations use such data, its full potential is not currently being exploited. The Irish government published the National Space Strategy for Enterprise in 2019, including the establishment of a national EO platform. As a critical enabler of the strategy, the *CAMEO* (Creating an Architecture for Manipulating Earth Observation data) project will democratise access to EO data using advanced analytics, providing a new single national repository for EO data, which will be co-developed with government departments and agencies, capturing impactful EO use cases and demonstrators to showcase the value and potential impact of EO data across Climate, Marine and Agriculture. Besides the technical development of such a disruptive technology, *CAMEO* will contribute to the development of necessary EO-related skills through targeted training courses.

The project, led by UCD, secured funding under the DTIF managed by Enterprise Ireland, to establish a new national EO platform. The members of the consortium include Vertice Integration Services Ltd T/A Vertice Cloud, BCC Risk Advisory Ltd T/A Edgescan, The Icon Group Ltd, Treemetrics Ltd, TechWorks Marine Ltd and Dell Technologies.

Assoc. Prof. Michela Bertolotto

Under the leadership of Assoc. Prof. Michela Bertolotto, the project will receive an investment of over €9 million, of which €5.9M is from Enterprise Ireland and the remainder from industry. The project builds on UCD's growing space-related research and innovation activities through C-Space, the UCD Centre for Space Research, and CeADAR, Ireland's Centre for Applied AI.

The UCD team in the School of Computer Science includes Asst. Prof. Gavin McArdle, Dr Oisin Boydell, Assoc. Prof. Rem Collier, Visiting Professor Gregory O'Hare; additional UCD collaborators from outside the School are Assoc. Prof. Francesco Pilla (School of Architecture, Planning and Environmental Policy), Professor Fiona Doohan (School of Biology and Environmental Science), Professor Nick Holden (School of Biosystems and Food Engineering), and Dr Declan Delaney (School of Electrical and Electronic Engineering).

The consortium combines research and development expertise in spatial data management, EO data analytics, AI and multiagent systems, cloud-based computing, data quality assessment, interface development, security, for climate, agriculture and marine applications.

ENTERPRISE IRELAND
where innovation means business

Rialtas na hÉireann
Government of Ireland

Project Ireland 2040
Building Ireland's Future
Disruptive Technologies Innovation Fund

BIG DATA SOLVES WORDLE

Prof. Barry Smyth used a Wordle simulator to generate data and discover the best strategies for success.

Like many I first became aware of Wordle over the Christmas break when I started to notice lots of grids of green, yellow, and grey squares appearing in my Twitter feed as players shared their efforts. Around this time every year I am usually on the hunt for a new data science case-study for my 3rd year Data Science in Practice students and I thought Wordle would fit the bill. I built a Wordle simulator and set it to work to play over 50 million games, making more than 300 million guesses, to generate a large dataset to use to answer the sort of questions many have been asking: what is the best start word (try TRACE or CRATE or TALES)? Are some words more difficult than others (yes, watch out for duplicate letters)? Are some letters more difficult to get right than others (yes, the first letter is tricky because it's rarely a vowel)? Should guesses always satisfy the hints (yes, especially if you want a short game)? Which hints are the most important (pay special attention to the green squares)?

In parallel I have also been building a separate dataset of >5M Wordle games shared on Twitter. Even though these shares do not reveal the letters, only the colour-coded hints, they can still be used to answer some complementary questions including the great Wordle conspiracy theory: whether the New York Times made the game harder after it acquired and re-launched it. It didn't! At least there is no evidence that the post-acquisition games were any more challenging than the pre-acquisition ones, based on the games shared on Twitter.

If you want to find out more about this line of research, I have been publishing it on my Medium blog (https://barrysmyth.medium.com) and on Towards Data Science (https://towardsdatascience.com) and the work has been featured by The Guardian and Bloomberg.

UCD C-QuEST AND THE QUANTUM ADVANTAGE

Asst. Prof. Simon Caton is a member of the steering group for the UCD Centre for Quantum Engineering, Science, and Technology (C-QuEST) *a focus for interdisciplinary collaboration, research and teaching of all things quantum.*

Despite having been "a thing" for many years, Quantum Computing has recently been garnering significant attention. We can largely attribute this to advances in quantum hardware, its availability via Cloud-like platforms, and the rapid increase in software tools to use, and simulate the use of, quantum technology. This has allowed the development of "quantum algorithms" that can be tested and run on modern day noisey intermediate scale quantum (or NISQ) computers. The hype in quantum computing stems from properties like entanglement and superposition. These properties do not exist in classical computing scenarios, but allow quantum computers to perform "complex" calculations that when applied to specific computational problems are expected to allow quantum computers to solve these problems faster than their classical counterparts, i.e. exhibit quantum advantage. These problems belong to the broad areas of machine learning, optimisation, and computational sciences in applications like biology, chemistry, finance, and telecommunications (often referred to as quantum internet). Yet, not everything stands to benefit from advances in quantum computing: modern encryption algorithms could be at risk (or be easier to crack) thanks to increases in computational capabilities that quantum computers might offer. Consequently, researchers now seek to investigate "post-quantum cryptography" to protect our IT and security systems. As computer scientists we need to consider how to best learn and teach quantum technologies; from quantum programming, and quantum algorithms, to more advanced topics such as quantum cryptography and quantum data science. Perhaps most importantly, we need to understand how to differentiate hype from reality. A major goal of C-QuEST is to consider what it means for a computer scientist to be quantum literate. www.ucd.ie/quantum/

C-QuEST
CENTRE FOR QUANTUM ENGINEERING, SCIENCE, AND TECHNOLOGY

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MULTI-DISCIPLINARY RESEARCH PROJECTS BRING NEW PERSPECTIVES ON SOCIAL ISSUES

Applying computer science tools and techniques for new solutions to complex problems.

The Irish Research Council's COALESCE is a funding programme that is explicitly aimed at inter-disciplinary research. While it may seem obvious that advances and techniques from one field might yield insights in other fields, this is difficult to accomplish due to different conceptual lenses and disciplinary siloes. UCD won seven grants under the programme (the highest by any Higher Education Institution), out of these UCD School of Computer Science won three. All these grants focus on social issues, and attempt to use computer-science tools/techniques to bring a new perspective, or attempt new solutions.

Two of the grants (*InEire* and *COTHROM*) focus

on the theme of using data-driven techniques to analyse issues raised in the wake of inward migration. *InEire* (Asst. Prof. Simon Caton in collaboration with TU Dublin) will use Data Analytics and qualitative mechanisms to understand the sources of, and forms of, anti-immigrant sentiment in Ireland. *COTHROM* (Asst. Prof. Vivek Nallur in collaboration with UCD School of Politics and International Relations) will use a fusion of quantitative data and qualitative legal constraints, to understand and predict the impact of policy measures on migrants. The third grant *Platforming Harm: Alt-Tech Platforms and Covid-19 health narratives* (Professor Pádraig Cunningham in collaboration with the UCD School of Information and Communication Studies) looks at the bigger picture of online social interaction and will analyse the proliferation and amplification of false information and claims, especially with regard to society-wide events, such as the Covid-19 pandemic.

TWO UCD CS-LED TEAMS SHORTLISTED FOR THE SFI-DEFENCE ORGANISATION INNOVATION CHALLENGE

The teams will collaborate with the Defence Forces and compete for funding to develop disruptive solutions to challenges identified by the Defence Organisation that are of broad relevance to society. The Challenge consists of three phases: Concept, Seed and Prize Award. Ten successful teams were awarded funding to initiate their projects. These teams undergo a rigorous progress review after 3 months and up to 5 shortlisted teams will be provided with further funding of €200k to validate and prototype their proposed solutions. Finalists will then compete for the overall prize award of €1m.

Innovative online Decision Support System to enhance aerial firefighting

FireFly aims to enhance the efficiency and effectiveness of the fire extinguishing capability of rotary-wing aircraft. The proposed solution, an innovative online Decision Support System, will be developed consisting of tools for data ingestion, aggregation, analysis, and visualisation, to enhance aerial firefighting. The members of the *FireFly* team are: Asst. Prof. Gavin McArdle and Assoc. Prof. Michela Bertolotto from UCD Computer Science and Comdt. David Mackey, Irish Air Corps.

Harnessing machine learning and virtual reality to deliver more effective and more environmentally sustainable pilot training

The *MENTOR* challenge harnesses machine learning and virtual reality to deliver more effective and more environmentally sustainable pilot training. The members of the *MENTOR* team

are: Assoc. Prof. Brian Mac Namee, UCD Computer Science, Dr Anna Donnla O'Hagan, DCU, Lt Niall Dungan, Irish Air Corps, as well as VR simulation training company VRAI. Brian Mac Namee said, "This is a great opportunity to apply our expertise in machine learning and human performance analysis to improve pilot training at the Irish Air Corps. The rich dataset we can collect from the virtual reality simulation platform provided by VRAI offers massive opportunities to better understand and improve pilot training."

RESEARCHER SPOTLIGHT

Assoc. Prof. Catherine Mooney is Vice Principal for Equality, Diversity and Inclusion in the UCD College of Science.

I would describe myself as a computational biologist. I work at the intersection of biology, medicine and computer science, mostly in the development of biomarkers for diagnosis, therapeutic response and disease progression in breast cancer, epilepsy and metabolic health in obesity.

Tell us about your research group

In my Life Science Data Analytics Research Group, LiSDA, we are working towards solving problems that will help to improve the lives of patients, their families, and caregivers.

LiSDA is entirely made up of women at present. This is unusual in computer science which is predominately male. However, I think it does show that there are plenty of talented women around. I have heard some say that we need to lower the bar to admit more women, of course, I completely disagree. We do, however, need to level the playing field so that we all get an equal opportunity and ensure that the evaluation metrics that we use are fair to all.

What advice would you have for women starting out on an academic career?

I would advise women who are starting out their academic careers, or who are considering an academic career, to find a strong mentor, someone who can help you to navigate an often obscure career path, and someone who can advocate for you, if needed. This has been enormously helpful for me. I would also recommend creating a strong network of women, at a similar career stage, for moral support, so that you know that you are not alone in the challenges that you face. Finally, do some resiliency training.

There is still a lot of bias against women, including in computer science, but I do believe that things are getting better. UCD have put a lot of supports in place including the recently launched Dignity & Respect Report and Support Tool, where anyone who experiences harrassment, sexual haressment or bullying can find help. More locally, in the School of Computer Science I have been involved in a number of efforts such as Women@CompSci to promote equality, diversity and inclusion and to make students and staff of all genders and identities feel welcome.

ASSOC. PROF. HENRY B. MCLOUGHLIN WINS PRESTIGIOUS AWARD

On October 29, 2021, the Beijing Municipal Government held the 15th "Great Wall Friendship Award" awards and symposium. Assoc. Prof. Henry B. McLoughlin, the software engineering coordinator of Beijing-Dublin International College (BDIC), won a "Great Wall Friendship Award". On behalf of the Beijing Municipal Government, Chen Jining, the Mayor of Beijing, presented the award to Assoc. Prof. McLoughlin in recognition of his outstanding contributions to BDIC and Beijing's educational development. The "Great Wall Friendship Award" is the highest honour awarded by the Beijing Municipal Government to foreign experts working in Beijing.

Accepting the award, Assoc. Prof. McLoughlin said: "This is a huge honour to receive and I am quite humbled by it. It recognises some of the small contributions I have been able to make to Beijing but also reflects well on BDIC and how it is viewed within the city. Hopefully we can build upon this when we return to Beijing in the Spring and further enhance our reputation."

BDIC is a joint international partnership between UCD and Beijing University of Technology (BJUT). Located on the BJUT campus in Beijing, BDIC offers students world-class international education in Science, Engineering & Business, through English, with the majority being delivered by UCD lecturers. Students graduate with dual degrees from both UCD and BJUT.

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LEADING THE FIGHT AGAINST CYBERCRIME

The UCD Centre for Cybersecurity & Cybercrime Investigation is at the forefront of digital law enforcement across Europe and beyond.

Since 1998 CCI has been helping law enforcement, government and industry to deal with the challenges of our increasingly digital world. CCI has built excellent relationships with national and international law enforcement agencies and is a founding member of the European Cybercrime Training & Education Group and the European Anti-Cybercrime Technology Development Association.

Capacity building and upskilling

CCI helps law enforcement build skills to investigate cybercrime and crimes with digital evidence, through training, forensic tool development and targeted research. Course topics range from introducing basic investigative skills to advanced specialist subjects, such as Open Source Intelligence Gathering and Malware Investigations. The audience extends beyond law enforcement to include government and industry. Recently this is being facilitated through the Higher Education Authority funded *CYBERSKILLS* project.

Helping to develop Ireland's cybersecurity capabilities and preparedness

CCI provides advice and support to the Irish banking sector, through its 10 year partnership with Banking & Payments Federation Ireland (BPFI). BPFI members have contributed over €2.5 million to CCI to support research into online financial crime. CCI has a similar relationship with the Irish National Cybersecurity Centre (NCSC), and recently signed a €1.6 million contract to undertake research into national cyber threats.

EU-funded projects

CCI has participated in many EU-funded projects with law enforcement, academia and industry and has received over €17 million in funding to support research into cybercrime and cybersecurity challenges. CCI are coordinators of the following projects:

INSPECTr

Intelligence Network and Secure Platform for Evidence Correlation and Transfer

The goal of this €7 million EU H2020 funded project is to develop a shared platform and process for gathering, analysing, prioritising and presenting key data to help predict, detect and manage crime.

INSPECTr will employ big data analytics, cognitive machine learning and blockchain approaches, while complying with responsible research and ethics requirements and respecting and preserving civil liberties.

https://inspectr-project.eu/

FREETOOL

Free Reliable Tools for Investigating Cybercrime

The *FREETOOL* project received its first funding from European Commission's Directorate General for Migration and Home Affairs in 2012, to develop a range of free digital forensic tools specifically for law enforcement investigators. Twelve tools have been developed collaboratively by skilled volunteer developers, testers and feedback from the active community of 3000 law enforcement users from across the world. https://thefreetoolproject.eu/

CCI is a project partner in the following projects:

ILEAnet

Innovation by Law Enforcement Agencies networking

A €3.4 million H2020 project to support the establishment of a network of practitioners to encourage and facilitate engagement in security research and the exploitation of project results. https://www.ileanet.eu/

CYCLOPES

Fighting Cybercrime – Law Enforcement Practitioners' Network

CYCLOPES is a €3.5 million H2020 project to develop a practitioners network for fighting cybercrime that will define capability gaps and monitor the development of new technologies, research activities and innovations in this domain.

https://www.cyclopes-project.eu/

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PRIVACY-PRESERVING PERSONALISATION FOR PUBLISHERS

UCD-based start-up company recsyslabs is using artificial intelligence (AI) to make it easy for publishers to deliver tailored newsletters based on readers' interests, while also preserving their privacy and making it easy for them to see why specific content was recommended.

The recsyslabs technology uses AI to automatically segment readers, based on their interests, and generates one newsletter for each segment by selecting the most relevant content for each subscriber base.

The founders of recsyslabs are Dr Ernesto Diaz-Aviles, Dr Claudia Orellana-Rodriguez and Dr Igor Brigadir, who are affiliated to UCD School of Computer Science. recsyslabs received funding from the Enterprise Ireland Commercialisation Fund and spun-out in July 2021 with the support of NovaUCD (UCD's innovation hub).

recsyslabs was one of five emerging startup participants in the annual Nova UCD Venture Launch Accelerator programme in November 2020. The Venture Launch Accelerator aims to equip UCD researchers with the knowledge, skills and understanding to create a commercial venture with a viable business plan, out of their research.

The recsyslabs team presented their research at RecSys '21: Fifteenth ACM Conference on Recommender Systems in September 2021. Read the text in ACM Digital Library here

www.recsyslabs.com

FUNDING

In the academic year 20-21, the school registered grants from external sources worth just over €8 million. We added to our successes in the EC Framework Programme, Horizon 2020.

Asst. Prof. Madhusanka Liyanage is a partner in the project *Security and Privacy Accountable Technology Innovations Algorithms and machine Learning (SPATIAL)*.

Dr Michael O'Grady is a partner in the HORIZON 2020 project *Inclusive Science and European Democracies (ISEED)*.The ISEED project will use the experience of citizen science as a model to rethink how participatory and deliberative practices can be successfully implemented in democratic governance. Its goal is to develop a new conceptual and empirical framework - based on a multidisciplinary area of expertise and skills - aimed at testing the role and value of active citizen participation in institutional decision-making, taking into account open, transparent and shared access to deliberative processes.

Asst. Prof. Soumyabrata Dev and Dr Muhammad Salman Pathan received HORIZON 2020 funding for a project entitled *Analyzing Onset of Critical Events Using a Machine-Learning Framework*.

Assoc. Prof. Tony Veale received funding from Volkswagen Foundation (VolkswagenStiftung) for a collaborative project titled *Bots Building Bridges (3b): Theoretical Empirical and Technological Foundations for Systems that Monitor and Support Political Deliberation Online*. This project focuses on human and technical agents and the influence of social bots on political communication online. By collaborating with social scientists and civil society stakeholders, the project aims to understand online manipulation of communication and to develop tools and methods that monitor and support political deliberation online.

Assoc. Prof. Alexey Lastovetsky with Dr Ravi Manumachu received funding from the Sustainable Energy Authority of Ireland (SEAI) for a project titled *Software tools and solutions to improve the energy efficiency of servers and data centres*.

ACHIEVING TRUSTWORTHY, TRANSPARENT AND EXPLAINABLE AI FOR SECURITY SOLUTION DEVELOPMENT IN EUROPE

The *Security and Privacy Accountable Technology Innovations, Algorithms, and Machine Learning (SPATIAL)* project which UCD is partner to, kicked off in September 2021. The EU-funded project will address the challenges of black box artificial intelligence (AI) and data management in cybersecurity. Black box AI refers to AI systems that receive input and produce output without end-user understanding. As inputs and outputs cannot be easily seen or understood, it can lead to issues within and across organisations. To address these issues, *SPATIAL* will design and develop resilient accountability metrics, privacy-preserving methods, verification tools and system frameworks to pave the way for trustworthy AI in security solutions. The project focuses on three specific technical contexts in which AI security solutions are being deployed: mobile systems, 5G and Internet of Things (IoT). The project also aims to help generate appropriate skills and education for trustworthy AI in cybersecurity on both societal and technical aspects. The UCD team in the School of Computer Science comprises Asst. Prof. Madhusanka Liyanage, (PI), Asst. Prof. Shen Wang (Co-PI), Dr Bart Siniarski (Project Manager), Chamara Prabhash and Thulitha Theekshana (Researchers). The UCD team is focusing on Beyond 5G and 6G network security and privacy aspects, working towards improving the accountability and resilience in their use cases based on Edge computing, IoT, privacy-preserving AI, and cybersecurity analysis.

The *SPATIAL* consortium is coordinated by Dr Aaron Ding (TU Delft, Netherlands) with 12 partners across 8 European countries (Netherlands, Germany, Spain, Finland, France, Ireland, Serbia and Estonia). The consortium combines long-standing research expertise in AI, cybersecurity, IoT, edge computing, and lab-to-market know-how. The project budget is €4.96 million. https://spatial-h2020.eu/

SPATIAL

ADDRESSING IRISH INDUSTRY'S FUTURE SKILLS NEEDS IN THE DIGITAL TRANSFORMATION ARENA

The Advance Centre launched in 2020 with funding from the Higher Education Authority worth €14 million. It brings together academic experts and industry leaders from across the high-tech sector with the common goal of delivering a portfolio of modules and courses addressing Irish industry's future skills needs in the digital transformation arena.

A key goal of the Centre is to support upskilling professional learners seeking flexible study options alongside full-time students. This includes the offering of individual modules from new and existing programmes through blended and online learning approaches. The successful completion of a module, will give the learner a micro-credential, enabling the learner to bundle or stack their credits to earn an accredited award e.g. Graduate Certificate, Graduate Diploma and Masters. The Centre offers modules and programmes from University College Dublin, Atlantic Technological University – Sligo and TU Dublin.

The UCD School of Computer Science is offering courses in Cyber Security, Data Science, Software Engineering and Quantum Engineering, as well as supporting other programmes in the digital transformation field. For more details, please visit www.advancecentre.ie or contact advance@ucd.ie.

Advance Centre

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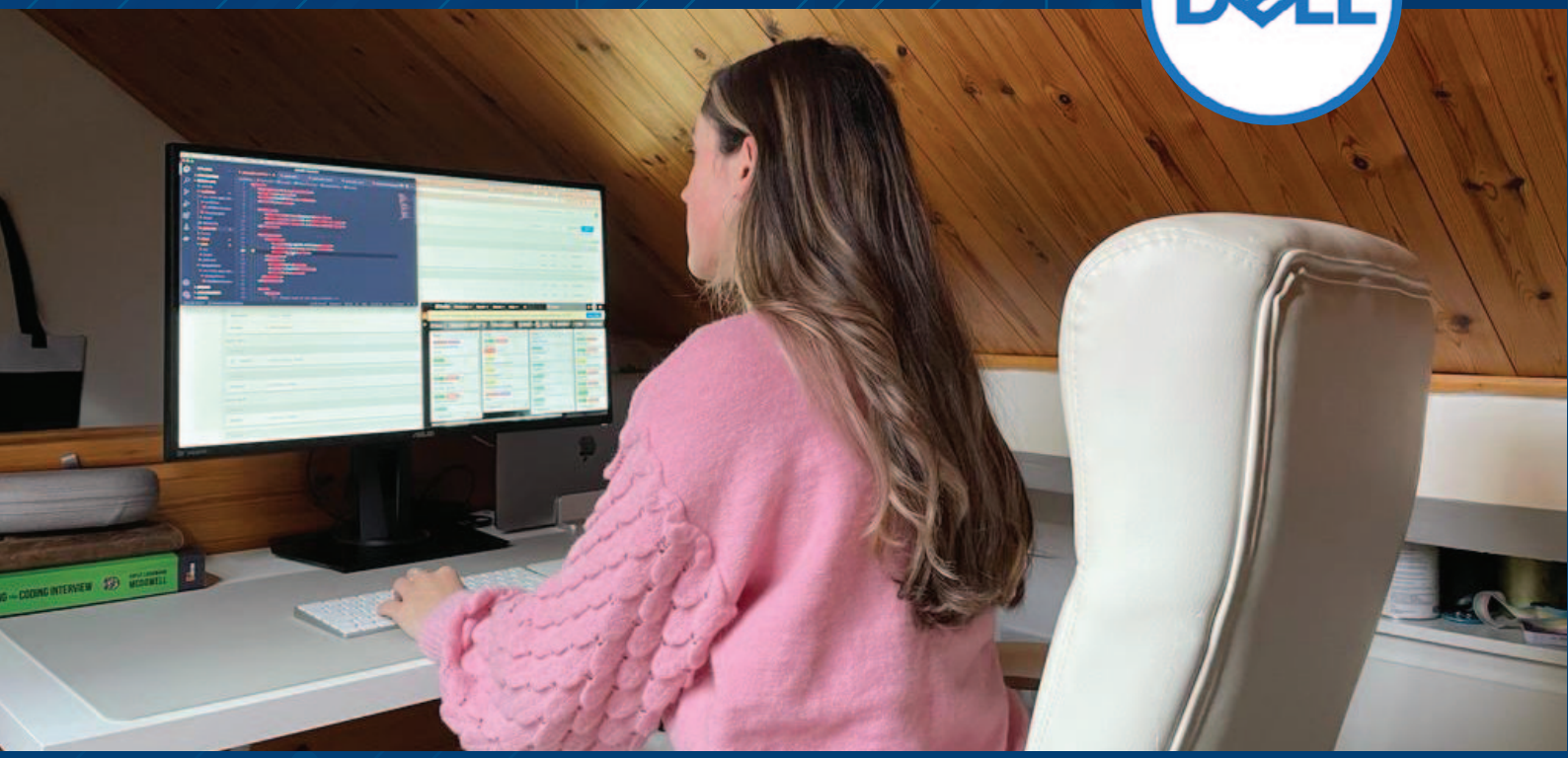
STUDENT EXPERIENCE

Andra Antal-Berbecaru's internship with Dell Technologies.



As part of my third-year placement, I interned as a Software Engineer at Dell Technologies, where I worked on Web Accessibility, a topic that was entirely new to me. I am extremely grateful to have been introduced to this important aspect of technology, and I believe all developers should be aware of it. According to the World Wide Web Consortium, the goal of web accessibility is to make to make the web "accessible to people with a diverse range of hearing, movement, sight, and cognitive ability" and to remove "barriers to communication and interaction that many people face in the physical world today" . Therefore, knowledge and proper implementation of accessibility is essential for all organisations not only because it considers all people as potential customers and/or users of their products and services, but it also exposes businesses to a greater target market otherwise missed out on.

The project I contributed to revolved around automating Web Accessibility Testing through CI/CD pipelines. CI/CD refers to 'continuous integration, continuous delivery and continuous deployment'. Essentially this is a method of delivering apps to customers by introducing automation into the stages of app development, and has become a popular way of approaching software development.

Of all technologies used in this project, I had experience with only one, JavaScript, but I would say I was well equipped in terms of Computer Science methodologies to grasp new skills relatively fast. I'm a sponge for information and I love learning new things, so I tried to avail of the opportunity to expand my skillset with courses made available by Dell. I also had many opportunities to learn directly from my mentor, who was the full-stack engineer and project architect on my team. With his help and direction, as well as the guidance from other members on my team, I was ready to add code within my first month of joining.

My contribution to the project was eventually recognized by higher management as part of the team effort, and I was really grateful. This was quite fulfilling and validating, but I'd say the most rewarding part for me during my internship were the experiences I had, the opportunity to share with my team mates, and the bonds that resulted from that. As cheesy as it sounds, I formed strong connections, and had a massive growing experience, both in skillset and in mindset.

ALUMNI NEWS

Patrick McLaughlin BSc 1985

Patrick is Chief Architect, SaaS Security at Oracle. Since UCD, his 35 year ICT career has taken him to around 60 countries.

"I decided firstly to study Science in UCD and only when I was there chose the Computer Science path. My 4th year project was to mathematically 'straighten' 12 Landsat images of parts of Ireland and to mosaic them together using ground-control points to form a complete satellite picture of Ireland. I still remember Dr Joe Morris' 'Program Construction' lectures showing how fundamentally simple programming is, regardless of environment or language that crops up. If you are considering studying CS in university, don't be put off if you find programming difficult at the beginning - that's not unusual and due to the order in which you (mis-) learn the basics which are actually simple but need practice to make them sink-in. A pivotal moment in my career came in the late 90's and early 2000's when I was Chief Architect and CTO of Baltimore Technologies - that experience in hard-core security, PKI and cryptography, is still relevant today and helped get me job offers in the top IT companies and was a major reason I have remained successful in the cybersecurity field. Young graduates today must work hard, have perseverance and flexibility to compete globally. They also need to find out which area of computing they can be passionate about so that it's not a slog but something they love to do. Aim to be doing something you are good at, something you like doing and something there is high demand for."

Will Connors BSc Computer Science with Data Science 2020

Will is a Professional Rugby Player for Leinster and Ireland's national rugby union team.

"I found my time in UCD to be very enjoyable. The greatest challenge for me was how little exposure I got to labs as a result of my training days clashing, this meant I probably did not get to meet as much of my course mates as I would have liked. In saying that I still made some great friends with whom I still stay in contact. My short term career plans are mainly based on my Leinster and Irish aspirations and trying to make as much of an impact there as I can. However, I have still been upskilling outside of rugby working with Kitman in their Data Science team and even trying to come back to UCD for further education. Long term I would like to keep working in team environments somewhere in Tech. I find I operate best in this setting and I enjoy team success far more than individual success. Studying computer science and my sporting career both require a certain discipline to keep working through a problem even if it's throwing up errors. The feeling of winning a game is similar to getting a piece of code to work how you want it to. Both cases can be frustrating at times but worth it when you get through it. I think the most important part of trying to balance everything is being disciplined in whatever schedule you map out. Having a plan set out on a Sunday evening laying out exactly what you want to get out of the week is a great way to keep you on course. This allows you to get the most out of your academics/sports but also frees up time to meet your friends."

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