UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

COMPUTER SCIENCE

A Message from Professor Barry O'Sullivan, Head of Department

Welcome to the first issue of our Department's newsletter. It is a privilege for me to be the Head of Computer Science at a time when the IT sector is rapidly expanding and our Department is doing so well. We as a Department aim to shape the future of the industry by producing the highest quality graduates, engaging in cutting-edge research, and partnering with industry in order to have real impact on society.

Since becoming Head of Department in 2013, I have witnessed impressive achievements by staff and students. In 2013 and 2014 alone, the Department was awarded research grants worth over €12.5m, while also being a founding partner in the Insight Centre for Data Analytics, which represents the single largest investment the Irish state has ever made through a single research grant. The total investment from Science Foundation Ireland and industry in Insight is €88 million. We are also involved in two new SFI Research Centres (CONNECT and LERO), establishing two new Enterprise Ireland Technology Centres (IC4 and CeADAR), and coordinating one of the first successful ICT projects funded by the European Commission's H2020 programme.

We launched two new courses: the MSc in Data Science & Analytics in 2013 in partnership with the Department of Statistics, and the BA in Digital Arts & Humanities in 2014, collaborating with the College of Arts, Celtic Studies and Social Sciences. Several of our staff have won awards recognising teaching, service, and leadership. I would like to congratulate all or our graduates and notably our seven female PhD gradutes.

The Department plans to continue to ensure that we deliver excellence through our research and teaching activities, as well as through our collaborations with all of our external stakeholders and industry.

RESEARCH SUCCESS FOR COMPUTER SCIENCE 2014

Professor Cormac Sreenan, Computer Science, UCC will play a leading role in the new SFI Networking Research Centre funded by Science Foundation Ireland in 2014. The CONNECT Research Centre focuses on future broadband, cellular and Internet-of-Things networks. Professor Sreenan is one of the key Principal Investigators involved in CONNECT, and as one of the Centre's Co-Directors will lead research on networking, software and protocols. CONNECT combines the expertise of 10 academic institutions, including lead partner Trinity College Dublin, as well as 38 national and international companies. It was selected by SFI after a rigorous scientific peer-review and impact assessment. Speaking after the announcement at Dublin Castle, Professor Sreenan said that "CONNECT offers a real opportunity to define the next-generation of computer networks, with associated societal benefits and economic impact here in Ireland."
E: c.sreenan@cs.ucc.ie

Cormac Sreenan

LERO The Irish Software Research Centre - Software is everywhere, embedded in industry sectors such as manufacturing, medical devices, financial services, cloud computing, analytics, and smart cities. LERO's research mission is to replicate the success of traditional software engineering in the context of large-scale, pervasive, physically-integrated, highly intercon-nected, evolving, and continuously available systems, in which the boundary between design time and runtime is disappearing. Professor Gregory Provan is the UCC Principle Investigator in the recently funded SFI Centre.
E: g.provan@cs.ucc.ie

Gregory Provan

CloudLightning: Self-Organising, Self-Managing Heterogeneous Cloud - Professor John Morrison recently won a major European H2020 Award worth in the region of €3.9m, of which he is coordinator. The project partners are UCC, DCU, Intel, MAXELER (UK), NTNU (Norway), IaAT (Romania), CERTH and DUTH (Greece). Currently cloud infrastructure, are composed of a large number of homogeneous machines centrally managed and made available to the end user using standard delivery modes. As clouds increase in size and as machines of different types are added to the infrastructure heterogeneous clouds are being created. To efficiently access heterogeneous resources and, at the same time, to exploit these resources to simplify service deployment requires a re-evaluation of our approach to service delivery.
E: j.morrison@cs.ucc.ie

John Morrison

Research led Teaching

Celebrating George Boole 1815-2015

George Boole was appointed the first Professor of Mathematics at UCC in 1849.

In 2015, University College Cork celebrates the bicentenary of the birth of George Boole, 1815-1864. Born in Lincoln, England, Boole was a mathematical genius who was largely self-taught. His appointment as the first Professor of Mathematics at UCC in 1849 provided him the opportunity to develop his most important work, "An Investigation of the Laws of Thought".

Boole is a pivotal figure, and his ground-breaking invention of Boolean algebra and symbolic logic pioneered an entirely new area in the mathematics of his day. But the profound effects of his work were by no means confined to the realm of mathematics - some eighty years later,

In boyhood, as a pupil of mathematics and optics he 'learnt by doing' with his father, calculating the focal length of a lens for a new telescope.

Boole spent fifteen years at UCC (1849 - 1864) and has been quoted as saying, "I can say with perfect truth that I feel a daily increasing delight in my new duties."

Some of Boole's major honours included winning the Keith Prize (1855) for his work entitled "On the Application of the Theory of Probabilities to the Question of the Combination of Testimonies or Judgements"; being elected Fellow of the Royal Society in 1857; publishing his third book in 1859 on Differential Equations.

"An Investigation of the Laws of Thought", Boole's most important work published in 1845

when efforts began on the construction of electronic computers, it was Boole's ideas that provided the perfect basis for the underlying circuits. Moreover, these ideas are used not only in low-level circuitry, but are pervasive in the logic of high-level programming, with the word "Boolean" being familiar to computer programmers worldwide.

His legacy surrounds us everywhere, in computers, information storage and retrieval, electronic circuits and controls that support life as well as in learning and communications technologies pervasive in the 21st century.

Thus, he has rightly earned his description as being the 'father of the information age'.

The practical application of his ideas, and the eventual societal benefit of his work, learning and communication, would certainly have pleased Boole. He was a practical scientist, dedicated to 'understanding the thought processes of the human mind'. He was a mathematician / author who tested each idea exhaustively before committing to print.

The UCC celebration of George Boole 200 (1815-2015) features an ambitious range of projects and events including: Redevelopment of Boole's house at 5 Grenville Place, in partnership with Cork City Council; conferences; exhibitions; a genealogy project; outreach; a film documentary; a revised edition of Professor Des MacHale's biography of George Boole; commissioning of a statue of Boole; exhibition of works at UCC Glucksman Gallery; and the establishment of the UCC George Boole Institute.

For information on the Year of George Boole, see georgeboole.com

GEORGE BOOLE* 200

Insight Centre for Data Analytics

The Insight Centre for Data Analytics is a joint initiative between researchers at UCC, DCU, NUI Galway, UCD and other partner institutions. Insight brings together more than 250 researchers from these institutions with over 40 industry partners, to position Ireland at the heart of global data analytics research. Insight offers data analytics solutions for a broad range of industry partners in ICT, healthcare, retail, finance, media and public services. Its expertise includes the whole data value chain from the integration of multiple heterogeneous data sources to discovering patterns and trends in data and making sense of them. Innovative solutions include using data to:

• Develop products and services based on matching the short and long term needs of individuals and organisations in real time
• Understand customer behaviour to increase customer satisfaction, experience and loyalty
• Drive recommendations and support decision making
• Find optimal solutions to complex problems
• Automate business processes.

Insight's research agenda incorporates state of the art Big Data computational paradigms with emphasis on the following themes (Research Groups).

• Linked data and semantic web
• Machine learning and statistics
• Media analytics and personal sensing (Professor Barry O'Sullivan)
• Optimisation and decision analytics (Dr Derek Bridge)
• Recommender systems

Each Research Group is headed by a group leader, with two groups led by Principal Investigators based in UCC.
The Insight team in UCC is led by Professor Barry O'Sullivan who also led the transition from the former 4C lab into Insight UCC. Following this transition, the research team has nearly doubled in numbers.

The team is currently working with several industry partners including TreeMetrics, Carma, Starwood Hotel and Resorts, Abtran, NitroSell, etc. The team is also involved in several EU Framework Programme and Horizon 2020 projects with multiple EU partners.

For further information:
Dr Chrys Ngwa, Business Development & External Affairs Manager
Room 2-56, Floor 2
Insight Centre for Data Analytics
Western Gateway Building
E: chrys.ngwa@insight-centre.org
W: www.insight-centre.org/

This Issue's Puzzle

Jack calls out 99 of the numbers from 1 to 100, in a random order. Jill must determine the missing number. How can she best do this, in each of the following cases:
    (a) she can use pencil and paper?
    (b) she can only use her head?

Submit answers to puzzles@cs.ucc.ie
The names of all those who answer the puzzle correctly will be published on www.cs.ucc.ie on 28th February 2015.

Our Programmes

- **BSc Computer Science**
- **BA Digital Humanities & Information Technology**
- **Higher Diploma in Applied Computing Technology**
- **MSc Computing Science**
- **MSc Data Science & Analytics**
- **MSc Interactive Media**

www.cs.ucc.ie

Upcoming Events

- **Munster Programming Training (MPT)**: 8th November 2014 - 27th May 2015
  The aim of this programme is to offer training in computer programming, web design, flash animation, video and image production to 14-17 year old secondary school pupils.

- **MPT Kiddo:** 10th January 2015 - 23rd May 2015
  The programme is designed for 6th class primary school pupils that have an interest in technology, puzzles and solving logical problems. They should also be enthusiastic about learning how games and applications are programmed.

- **George Boole 200** (throughout 2015)
  UCC are hosting a range of events to celebrate the achievements of George Boole, UCC's first Professor of Mathematics. Details of all events can be found on georgeboole.com/

- **Fourth Year Project Open Day** – 12th March 2015
  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.

- **Want a qualification in IT?**
  Come and talk to us about our conversion programmes: Higher Diploma in Applied Computing Technology (9 months) and MSc in Interactive Media (1-year) on March 18th, 5.50-7.30pm, Room 107, Western Gateway Building, UCC.

- **Irish Collegiate Programming Contest** (IrlCPC) – 28th March 2015
  The UCC ACM Student Chapter hosts the sixth annual Irish Collegiate Programming Competition (IrlCPC) this year. Teams of three are invited to register at http://acm.ucc.ie/irlcpc

UCC's Computer Science in Action 2014

Research led
Teaching

Department of Computer Science
University College Cork
Ireland
T: +353 21 420 5892
E: secretary@cs.ucc.ie
W: www.cs.ucc.ie
f : www.facebook.com/UCCCS
: @UCCCS

BSc Computer Science
Class of 2014

Open Day, October 2014

Some of our recent PhD graduates

Competitors at the ACM Programming
Competition, March 2014

Munster Programming Training,
November 2014