

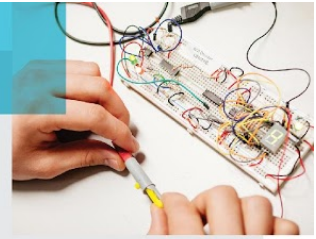


Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University

DÁMH NA hINNEALTÓIREACHTA AGUS NA RÍOMHAIREACHTA
FACULTY OF ENGINEERING AND COMPUTING

**Engineering
and Computing**

Research Day



Date: Thursday, 2nd May 2019

Time: 10.00am

Venue: HG22, Ground Floor,
Nursing and Human Science Building

Please come along to support research students as they give a brief one minute presentation on their research.

Light lunch will be provided after the event.

Register your attendance at:
goo.gl/XTxKCP



Research and Societal Impact

Welcome to the research day at DCU's Faculty of Engineering & Computing, an event which showcases research from all three schools in our faculty. Our theme this year is "**Societal Impact**", one of the key measures for successful research. In recent times, many funders have instructed scientists to broaden their assessment of scientific output and to focus on how it positively impacts on society. In DCU's most recent Strategic Plan (Talent, Discover, and Transformation: 2017-2022), it is clearly stated that "*we will be a place that nurtures discovery and our research will be renowned for both its excellence and its focus on societal needs.*" This will be demonstrated by the research presentations at our event today.

We have four sessions in all: 3 sets of oral presentations, followed by a poster session with lunch.

The first session begins with a brief introduction by Dr. Mark Roantree, followed by a presentation from Katya McDonagh (Research Support Office) on research integrity. The session wraps up with a presentation by Prof. Mark Towler with a talk entitled: *A Novel Screening Tool for Fracture Risk*. Mark is based at Ryerson University and St. Michael's Hospital, both in Toronto, Canada. He is working with researchers in DCU as a James M Flaherty Visiting Professor, funded by the Irish Canada University Foundation.

The next 2 sessions will contain a short presentation by a post-doctoral researcher, followed by a group of PhD students, each of whom will deliver their research topic in 60-second bursts. Every PhD presentation is numbered so you can easily find their poster during the Poster Session.

Enjoy the talks and do meet with the researchers during the lunch session!



Dr. Mark Roantree,
Associate Dean of Research at DCU's Faculty of Engineering & Computing.
2nd May 2019.

Agenda	
❖ 10.00 – 10.45	Introduction and Presentations
❖ 11.00 – 11.50	Research Session 1
❖ 12.00 – 12.50	Research Session 2
❖ 13.00 – 14.00	Poster Session & Lunch

Introductions and Presentations

Societal Impact

Dr. Mark Roantree,
Associate Dean of Research for Faculty of Engineering & Computing

Research integrity: what it means and why it is important

Ecaterina McDonagh
Research Support, DCU

Osentia®: A Novel Screening Tool for Fracture Risk

Mark Towler
Visiting Professor from Ryerson University, Toronto, CANADA

Research Session 1

Poster	Name	Title
	Dr Guodong Xie	Lexically Constraining the Transformer NMT Model with Heuristic Grid Beam Search Post-doctoral Researcher, Adapt Centre.
2	Zhengwei Wang	A Brain- inspired Framework for Evaluative Generative Adversarial Networks
4	Jaime Fernandez	Moving Object Path Prediction for Advanced Driver Assistance Systems
6	Adwait Joshi	Development of coated biomedical implants for orthopedic application
8	Suzanne McCarthy	An Automated ETL for Online Datasets
10	Alberto Poncelas	Data Selection for Neuronal Machine Translation
12	Xiao Liu	Towards Large-Scale Data analysis from a novel in-situ monitoring technique during the additive manufacturing of titanium alloys
14	Gueltekin Cakir	Disrupted Retail: Decision Making in the Age of Digital Retail
16	Fabio Silva	Improved Multipath for Virtual Reality
18	Procheta Sen	Proactive Information Retrieval (IR)
20	John Redmond	Development of 3D collagen-based scaffolds for use in breast cancer research
22	Abhishek Kaushik	Dialogue Based Information Retrieval
24	Fouad Bahrpeyma	Multi-Step ahead prediction: an analytical and algorithmic analysis
26	Daria Dziedzic	Leveraging Linguistic and Non-Linguistic Features in Automatic Reading Comprehension

Research Session 2

Poster	Name	Title
	Dr Sha Yu	Smart Site Survey: Vision-based 3D Reconstruction for Remote Indoor Scenes Post-doctoral Researcher, Insight.
1	Prajwal Doddaballapura	Tunable demultiplexer for optical frequency combs
3	Tai Mai	A framework to evaluate the ability of expressing business process of operational databases
5	David Azcona	CoderBot: AI Chatbot to Support Adaptive Feedback for Programming Courses
7	Solomon Ubani	Laser scanning method for the improvement of the surface morphology, grain size, contact area of interference bonded joints
9	Fiona Dermody	A Multimodal Positive Computing System for Public Speaking
11	John Monks	A Mobile Quality-oriented Cooperative Multimedia Delivery Solution
13	Lifeng Han	Multi-word Expression and Machine Translation
15	James Barry	Treebank Embedding Vectors for Out-of-domain Dependency Parsing
17	Sean Quinn	Towards Architecture-Agnostic Neural Transfer
19	Abigail Walsh	Automatic Processing of Multiword Expressions in Irish
21	Anderson Simiscuka	Real-Virtual World Device Synchronisation in a Cloud-enabled Social Virtual Reality IoT Network
23	Eric Moreu	Better Dating with AI: Analysing Tinder's data
25	Eric Arazo	Learning from corrupted data
27	Mohab Hammad	Compact Gain Switched Optical Frequency Comb Generator

Additional Posters

Poster	Name	Title
28	Raid Alrefai	Enhancement of the economic viability of AD through exploiting the whole biomass of mango waste and its residuals after digestion
29	Alla Alrefai	Impact of Cassava's Peel Starch on the Biogas Produced Through Anaerobic Digestion Process
30	Ghanashyama Prabhu	Accurate Exercise Identification from a Single Wrist-Worn Inertial Sensor
31	Liting Zhou	Lifelog Search Challenge - Data Analytics and Retrieval
32	Rashmi Gupta	Considering manual annotations in dynamic segmentation of multimodal lifelog data
33	Camille Ballas	DeepLO: Deep Learning Orchestration for edge applications
34	Eoin Daly	Energy Consumption in Wastewater Treatment Impact of Rainfall Events on the Electricity Consumption of Two Wastewater Treatment Plants
35	Cristiani Eccher	The Benefits of Simulating Production Control Strategies

Dr Katya McDonagh

Title : Research integrity: what it means and why it is important'

Research integrity is about knowing and meeting your responsibilities as a researcher. It means performing research to the highest standards of professionalism, at all points of the research process – from design through to dissemination. DCU is committed to ensuring the highest standards of integrity in all aspects of our research, as outlined in the [National Policy Statement on Ensuring Research Integrity in Ireland](#). These standards are also reflected in the [DCU Code of Good Research Practice](#). Research integrity standards seem obvious and self-evident but in practice they are confusing or challenging to meet. In this talk, I will discuss what research integrity means and why it is important to be aware of potential challenges when conducting research.

Prof. Mark Towler

Osentia®: A Novel Screening Tool for Fracture Risk

Osentia exploits a patented algorithm that combines information around a subject's protein structure with their clinical risk factors to determine relative risk of fracture. The lecture will consider how Osentia originated from basic research in Towler's laboratory through its development in clinical trials, emerging as a screening tool launched for over the counter testing in 2016, and is now sold through UK-based pharmacies.

Dr Guodong Xie

Title: Lexically Constraining the Transformer NMT Model with Heuristic Grid Beam Search

Transformer model has outperformed convolutional neural network-based (CNN) and recurrent neural network-based (RNN) in neural machine translation (NMT) domain. It is actually the state-of-the-art of machine translation technology. NMT model normally is trained towards general domain and can't well translate the terminology which can be found large amount in industrial domain documents, so it need to be adapted to be suitable for terminology translation. In our work, we first apply constrained decoding method – Grid Beam Search (GBS) on Transformer model, and then propose a source informed heuristic method that can fully take advantage of the alignment information from the multi-head attention mechanism in Transformer to speed the decoding phase of the GBS method, and guide the placement of constraints during the expansion of hypotheses in the beam search. Experiments on WMT English–German and Chinese–English translation domain adaptation tasks show that the proposed method significantly outperforms the basic Transformer model in terms of BLEU and METEOR score, and prunes up to 30% hypotheses to save up to 20% decoding time compared to the GBS model while maintaining comparable translation performance.

Dr Sha Yu

Title: Smart Site Survey: Vision-based 3D Reconstruction for Remote Indoor Scenes

The “smart site survey” is essentially a 2D to 3D modelling project that aims to virtually construct 3D models for remote scenes possibly with site-visit constraints. The initial input data will be layperson captured 2D images using smartphones. After uploading the 2D data, virtual 3D models corresponding to the target scenes will be automatically generated. Terminal users will be able to browse the 3D scenes and make plans for device ordering, deployment and installation, i.e. reconciliation of customer order with available space.

Acknowledgements

The support and commitment of the Faculty Research Students and guest speakers is greatly appreciated.

Special thanks to supervisors from across the 3 schools who helped prepare their PhD students for the event and to our technician Sean Haran who ensures the tech runs smoothly on the day. In addition, we would like to acknowledge support of Liam Domican and PhD student Adwait Joshi for setting up the event area. Further thanks to Irene McEvoy and Ema Chaventré for their help with organizing the event. Finally, we would like to acknowledge the support of our Executive Dean Prof. Lisa Looney for supporting the Faculty Research Day.