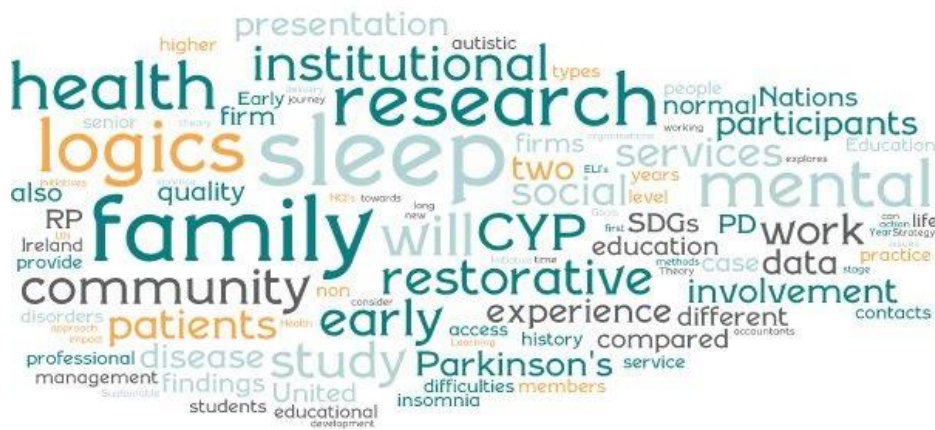National College of Ireland

NCI Research Day
5th edition

Tuesday 18th of June 2024

9:00 am – 16:15 pm
Executive 1

Agenda: NCI Research Day 2024

Tuesday 18th June 2024, Executive 1, National College of Ireland

09:00 – 09:05	**Welcome Introduction** Dr Arghir-Nicolae Moldovan (*School of Computing*)
09:05 – 09:15	**Welcome Speech** Prof Jimmy Hill *(Vice President Academic Affairs and Research)*
09:15 – 09:30	**Developing an Irish Restorative Community — Insights, Lessons, and Theory Contributions** Emma Wheatley & Miranda Curry *(Early Learning Initiative)*
09:30 – 09:45	**Delivering on UN Sustainable Development Goals through Community Action Research** Dr Josephine Bleach *(Early Learning Initiative)*
09:45 – 10:00	**An Exploratory Study: The Influence of a Professional Non-Family Accountant within a Family Firm and the Impact on Institutional Logics.** Theresa Mulcahy *(School of Business)*
10:00 – 10:15	**What's in a name? Solving a family history puzzle, using archival research while going digital** Desmond Gibney *(School of Business)*
10:15 – 10:30	**Mental health contacts and referrals for children and young people with social work involvement: findings from two epidemiological studies** Dr Barry Coughlan *(Psychology Department)*
10:30 – 10:45	**Sleep alterations in Parkinson disease** Ziba Asadpoordezaki *(Psychology Department)*
10:45 – 11:00	*Coffee Break*
11:00 – 11:30	**Keynote: Meaningful Consultation with Autistic Students for Inclusive Education from Early Childhood through to University** Assoc Prof Sinéad McNally *(School of Language, Literacy and Early Childhood Education, DCU Institute of Education, Dublin City University)*
11:30 – 11:45	**Insights on Teacher Professional Identity in Cambodian Schools** Prof Leo Casey & Deirdre Tinnelly *(Centre for Education and Lifelong Learning)*
11:45 – 12:00	**Experiential Learning: The Realm of Learning and Connection through ECEC Field Visits** Siobhán Canavan & Anna Barr *(Centre for Education and Lifelong Learning)*
12:00 – 12:15	**EngageSLT: From challenge to solution** Jane Sheridan, Emre Kavak & Mark Igushkin *(School of Computing)*
12:15 – 12:30	**Honey2Fish - A Hybrid Encryption Approach for Improved Password and Message Security** Dr Rohit Verma *(School of Computing)*
12:30 – 13:15	*Lunch*
13:15 – 13:45	**Keynote: Harnessing AI in Optical and Wireless Networks** Prof Marco Ruffini *(School of Computer Science and Statistics, Trinity College Dublin, The University of Dublin)*
13:45 – 14:00	**"They'll remember how you made them feel": Are public libraries in Ireland meeting the needs of Irish Travellers?** Tamara Malone *(Norma Smurfit Library)*
14:00 – 14:15	**FAIR Versioning of Datasets** Dr Alba González–Cebrián, Michael Bradford, Dr Adriana E. Chis & Prof Horacio González–Vélez *(Cloud Competency Centre)*
14:15 – 14:30	**Privacy-Preserving Logistic Regression for Cloud Environments** Dr Jorge Mario Cortes Mendoza *(Cloud Competency Centre)*

14:30 – 14:45	**A Q Methodology Study: Exploring Early Childhood Teachers Subjective Views on Universal Design for Learning (UDL) in Irish Pre-Primary Schools** Siobhán Canavan *(Centre for Education and Lifelong Learning)*
14:45 – 15:00	*Coffee Break*
15:00 – 15:15	**Coding Connections: Early Childhood Educators Guiding Computational Thinking with Robotic Play** Anna Barr *(Centre for Education and Lifelong Learning)*
15:15 – 15:30	**Examining the relationship between pro-inflammatory cytokine interleukin-6 (IL-6) and brain function during social cognition in individuals with schizophrenia and controls: A functional magnetic resonance imaging study** Dr David Mothersill *(Psychology Department)*
15:30 – 15:45	**Keeping the Connection-Stretch Graduate programme** Ramona Mihalka & Nikki Ryan *(Early Learning Initiative)*
15:45 – 16:00	**Findings from the IRC-Funded Study on Examining Factors Influencing the Implementation of Evidence-Based Interventions for People with Dementia in Ireland** Dr Michelle Kelly, Dr Caoimhe Hannigan *(Psychology Department)*
16:00 – 16:15	**Closing** Dr Arghir-Nicolae Moldovan

Speakers

Emma Wheatley and Miranda Curry
Early Learning Initiative

Developing an Irish Restorative Community — Insights, Lessons, and Theory Contributions

Abstract:
After a long history of conflict, violence, and marginalisation in Dublin's Inner City, the Early Learning Initiative employed restorative practices at a municipal level with an aim to develop this urban area into Ireland's first restorative community — to build stronger neighbourhoods, tackle local systemic and structural issues, and avert future violence. This presentation will represent eight years of data from ELI's restorative practice initiatives. Restorative practice (RP) is a social science and an approach to building, maintaining, and restoring relationships and community. Community action research and a mixed methods methodology is utilised to demonstrate the impact of educating RP practitioners (N=2560), embedding RP in schools (N=23) and other organisations (N=44), and empowering thousands of community members (N=5740) through experiencing restorative approaches and processes — from 2014 to 2022. Two theories are proposed as a framework for how restorative culture change could be planned and navigated in a community: Bronfenbrenner's Ecological Systems Theory, and a new theory introduced as Directional Embedding Theory. The presentation will share the lessons learned during the journey by discussing how restorative principles were instilled throughout initiatives, and how our theory contributions are used to evaluate and navigate RP implementation in organisations and support community development.

Biographies:
Emma Wheatley is the Restorative Practice Coordinator with Early Learning Initiative, at National College of Ireland, developed to address educational underachievement in marginalised communities. Emma's work is undertaken with support from the North East Inner City, with restorative approaches being utilised to address current and future relational and cultural challenges.

Miranda Curry is currently pursuing a BA (Honours) in Psychology at National College of Ireland. She is a research intern at Early Learning Initiative — supporting data management, analysis, and writing for publication. As an autistic woman, she does advocacy work and is pursuing a career in autism research.

Dr Josephine Bleach
Early Learning Initiative

Delivering on UN Sustainable Development Goals through community action research

Abstract:

The National College of Ireland has put sustainability at the very heart of its 5-Year Institutional Strategy. As part of NCI's Strategy, ELI has committed to contributing to NCI's delivery of the UN Sustainable Development Goals (SDGs): 1 'No Poverty'; 4 'Quality Education'; 5 'Gender Equality'; 10 'Reduce Inequality'; and 11 'Sustainable Cities and Communities'. It is also working towards 3 'Good Health and Well Being'; 16 'Peace, Justice and Strong Institutions and 17 'Partnership for the Goals'. For the first time, Early Learning Initiative included its commitment to the SDGs in the End of Year Report 2022/23. While the scale and scope of the global goals is unprecedented, partnership is key to their delivery. It is only through collaboration can we uphold our basic responsibilities to people and planet, but also set the stage for long-term success through ELI's prevention and early intervention programmes that consider a quality education the foundation to improving people's lives and sustainable development.

Recognising that the SDGs are integrated, interdependent and indivisible, this presentation explores how NCI delivers on its UN SDGs through community action research.

Biography:

Dr Josephine Bleach is the Director of the Early Learning Initiative, National College of Ireland since 2008. She is chair of the Home Visiting Alliance – Home Visiting Alliance (hva.ie). Josephine has a B. Ed degree (1980) from NUI; Masters of Studies in Education (2003) and a PhD in Education (2008) from Trinity College Dublin. She has many publications, including a book, Parental Involvement in Primary Education in Primary Education in Ireland. Her research interests are community development using Action Research; educational disadvantage; parental involvement in their children's development and education; professional development for educators; early learning, including literacy and numeracy; policy development and implementation. Her research profile is available at https://www.researchgate.net/profile/Josephine-Bleach

Theresa Mulcahy
School of Business

An Exploratory Study: The Influence of a Professional Non-Family Accountant within a Family Firm and the Impact on Institutional Logics

Abstract:
The objective of this research is to explore the influence of professional non-family accountants, in a senior management position, within the family firm and the impact on institutional logics. By decomposing institutional logics into means and end components, this research will shed light on how the components of the identified institutional logics co-exist and interact within the family firm. Exploring these interactions will provide an insight into how and why some logics compete while other logics display actions and purpose that complement each other. Understanding these conflicts, complementaries and clashes among means and ends will add to the literature on institutional logics in family firms and provide a more comprehensive analysis of how institutional logics in family firms interact with new and emerging logics when a non-family actor enters the firm.

A case study approach was deemed the most suitable to answer the research questions. Case study research attempts to capture the perspectives of different participants and focuses on how their different meanings illuminate the topic. This is particularly relevant in capturing institutional logics as actors reveal and interpret institutional logics in diverse ways. Cases will be family firms ("case firms) and data collection will be in the form of interviews and documentary evidence. Interviews will take place with family members (at senior management level) and professional non-family accountants who are working in the family firm at senior management level.

Biography:
Theresa Mulcahy is an Accounting Lecturer and Programme Director at the National College of Ireland. She holds a BSc Honours degree in Accounting from Queens University Belfast and an MBS in Accounting from Dublin City University. Theresa qualified as a Chartered Accountant with PricewaterhouseCoopers where she worked as a Manager in Audit and Advisory Services. Theresa is currently studying for her PhD at the South East Technological University, Waterford, under the supervision of Dr Collette Kirwan and Prof Sheila O'Donohoe. She is currently at data collection stage and is working on 5 case studies (family firms). Her research examines institutional logics in family firms particularly in the context of a non-family professional accountant entering the family firm. Theresa has presented her research at a number of doctoral seminars including the Irish Accounting and Finance Association (IAFA) and the Irish Academy of Management (IAM).

Desmond Gibney
School of Business

What's in a name? Solving a family history puzzle, using archival research while going digital

Abstract:
This story starts with a puzzle of a photograph of a grave marker, bearing the name of RAF Sergeant PB McRann and a service number 645384. Who was Sergeant McRann and why was this photo in my family's possession? A quick Google search added more questions than answers. Drawing on Alan Sangster's 2023 paper, 'Going Digital', about his personal journey towards becoming a digital historian, my presentation explores two members of a family across two generations, who both chose a career of service in the institutions of state (Royal Irish Constabulary and Royal Air Force), and whose years of service were abruptly ended.

By using digital resources rather than the more familiar archival methods, a severe case of ten year's writer's block has been solved; a family history has been researched and discussed in the context of the literature on the early years of the newly-independent Irish Free State, the role of the RIC, and the experience of volunteers from the Republic of Ireland who joined the British military around the time of the Second World War; and finally. a greater appreciation of what Sangster (2023) described as the opportunity provided by digitisation and digitalisation for historians to do history better.

Biography:
Desmond Gibney is an Assistant Professor in the School of Business and has been lecturing in accounting and finance in National College of Ireland since 2003. Desmond previously lectured in UCD Quinn School, after working in insolvency in Deloitte, and in other accounting roles in industry and public practice. He holds a business degree from Trinity College Dublin, as well as an MBA from UCD Smurfit School and a MA in Chaplaincy Studies and Pastoral Work from DCU. Desmond is a Fellow of the Association of Chartered Certified Accountants, and also holds a Diploma in Strategic Finance and Analytics from Chartered Accountants Ireland. Desmond's research interests include capital budgeting, business history and accounting history. His research has been published in Accounting History Review, Studies: An Irish Quarterly Review, Irish Journal of Management, Irish Independent, The Belvederian, and in the Routledge New Works in Accounting History series. Desmond has also been a guest on Newstalk's Talking History programme, and also presented at NCI's first Culture Night in 2023. Desmond's research profile is available at https://orcid.org/0000-0002-2006-5106.

Dr Barry Coughlan
Psychology Department

Mental health contacts and referrals for children and young people with social work involvement: findings from two epidemiological studies

Abstract:

Background: Survey work suggests that children and young people (CYP) with social work involvement experience higher rates of mental health difficulties compared to peers. Yet little is known about their contacts with and access to mental health services.

Aims: Drawing on findings from two epidemiological studies this presentation aims to provide an account of a) mental health contacts b) access to services for CYP with social work involvement.

Methods: In study 1, data for all CYP (n = 1,984,827) in contact with Child and Adolescent Mental Health Services (CAMHS) in England between 2016-2021 were analyzed. In study 2, data were analyzed for 71,763 CYP referred to mental health services in South London between 2007-2023. Associations between different types of social work involvement and a) contacts and b) referrals were examined. Findings were interpreted with experts-by-experience.

Results: Findings from these studies suggest that CYP with social work involvement are two-three times more likely to be in contact with mental health services compared to peers. However, these CYP are also more likely to be rejected by mental health services.

Discussion: These findings highlight significant unmet mental health needs amongst CYP with social work involvement and disparities in access to mental health services.

Biography:

Dr Barry Coughlan is a Psychology Lecturer at National College of Ireland and visiting researcher at the Department of Public Health and Primary Care, University of Cambridge. Barry's research addresses the social determinants of mental health and suicidal distress, especially among populations facing risk and adversity. For instance, a recent article, using data from 2million young people, shows that the demand on child mental health services in England is even higher than anticipated in reports from the Office of the Children's Commissioner, and there are inequalities in which children access services. A preprint of this paper can be found here. His research has attracted attention of policymakers in England, leading to sustained engagement with the Department of Health and Social Care, NHS England, Ministry of Justice, and the Department for Education.

Ziba Asadpoordezaki

Psychology Department

Sleep alterations in Parkinson disease

Abstract:

Having sleep disorder is increasingly recognised as an important risk factor and an early symptom of neurodegenerative disorders such as Parkinson's disease (PD). Several types of sleep disorders, such as insomnia, REM sleep behaviour disorder (RBD), excessive sleepiness, and restless legs syndrome are reported in patients with Parkinson even in the prodromal stage of disease. Most of these sleep alterations are associated with a poorer quality of life in these patients.

To assess sleep in patients with Parkinson's disease compared to normal controls, we analysed the data from almost 54,000 participants in the Fox Insight Data Exploration Network (Fox DEN) study. In this investigation, we explored the frequency of different types of sleep disorders in patients with Parkinson's and normal healthy control participants. Additionally, we examined mental health issues such as anxiety, depression, and cognitive decline. These symptoms act as crucial mediators or consequences for sleep difficulties. In particular, we discuss the association between experience of sleep problems and characteristics such as early onset Parkinson's disease or OFF state experience in patients, and how sleep problems can affect the quality of life in patients suffering from PD.

The difficulty of falling asleep or staying asleep during the night (sleep-onset insomnia and sleep-maintenance insomnia) was the most common type of sleep complaint in PD and normal control participants, though its rate was significantly higher in PD cases compared to normal controls. We concluded that sleep difficulties in Parkinson's disease are associated with a lower mood, impaired cognitive function, and quality of life, and are also linked to a higher rate of OFF-episode occurrence.

Biography:

Ziba is a PhD candidate in the Psychology Department at Maynooth University. She worked as a psychology lab technician at NCI last academic year. Her PhD research focuses on circadian rhythms and sleep alterations in an animal model of Parkinson's disease. She holds a master's degree in medical biotechnology, specializing in stem cell therapy for multiple sclerosis. Ziba worked as an assistant lecturer at Maynooth University for two years. Before starting her PhD in Ireland, she worked as a researcher at a well-known medical university in her home country (Iran) for several years. Her research interests include neurodegenerative diseases, sleep, circadian rhythms, and neuropsychology, although she also has publications in cardiovascular diseases.

Her research profile is available at:

https://scholar.google.com/citations?hl=en&user=LZaMZCMAAAAJ&view_op=list_works&sortby=pubdate

Keynote Speaker: Assoc Prof Sinéad McNally
School of Language, Literacy and Early Childhood Education,
DCU Institute of Education, Dublin City University

Meaningful Consultation with Autistic Students for Inclusive Education from Early Childhood through to University

Abstract:
Autistic students have the right to be heard in decision making about their education and to be active agents in shaping their educational experiences. These rights are protected in the United Nations Convention on the Rights of the Child (UNCRC United Nations 1989) and the United Nations Convention on the Rights for Persons with Disability (UNCRPD United Nations 2006). Yet educational research rarely includes the voices of autistic students. To identify implementable supports for education policy and translate these into practice we need to ask autistic students and their families what they consider to be beneficial and meaningful in their own education (Keating 2021). This talk presents a growing body of research in Ireland which is dedicated to including meaningful consultation with autistic children and young people about their educational experiences, from inclusion in Early Childhood Education right through to Higher Education.

Biography:
Dr Sinéad McNally is an Associate Professor of Psychology and Early Childhood Education at the DCU Institute of Education. Sinéad leads the research group, the Early Language and Learning Lab at DCU, which investigates children's development in educational contexts. Her research has been funded by the Irish Research Council, the Science Foundation Ireland, the Standing Conference on Teacher Education North and South, and the Childhood Development Initiative. Sinéad holds several positions of responsibility in inclusive educational research and in the wider community, including as external advisor to the Research Ethics Committee at the St Michael's House Services for People with Disabilities, and she sits on the editorial boards of the International Journal of Early Years Education, the International Journal of Early Childhood, and the Journal of Early Childhood Studies. She has held editorial posts at Autism and Developmental Language Impairments and Active Learning in Higher Education, and in 2022, Sinéad received the President's Award for Research Impact for her research in child development.

More information on Sinéad's research and list of publications can be found here.

Prof Leo Casey and Deidre Tinnelly
Centre for Education and Lifelong Learning

Insights on Teacher Professional Identity in Cambodian schools

Abstract:
The Professional Identity for Khmer Teachers (PIKT) study aims to understand and enhance the professional identity of early grade teachers in Cambodia. This project commenced in 2022 and is ongoing until early 2025. Emerging insights from recent fieldwork provides valuable information into teacher identity in Cambodia, alongside glimpses into what is currently happening in Cambodian Schools. This design-based research study is based on a sample of 25 early grade teachers who were recruited as volunteer research participants. Data collection took place one year apart in 2023 and once again in 2024. This consisted of in-class observations, teacher interviews and 'school and community' profiles. From the data, two bespoke workshops on teacher professional identity were designed and delivered to the participant teachers. The findings show that the early grade teachers in Cambodia regard their professional identity with a sense of passion, commitment, and resilience. Despite challenges such as limited resources, they enjoy their work and have no desire to leave the profession. According to the teachers, the PIKT workshops offered active participation, peer discussions, sharing of experiences, and new perspectives. These insights can inform the design and implementation of future research, ultimately supporting the growth and development of teachers in Cambodia.

Biographies:
Professor Leo Casey is Director of the Centre for Education and Lifelong Learning at National College of Ireland. He is Principal Investigator for the Irish Research Council's Coalesce project on the challenge of enhancing teacher professional identity in Cambodian schools. His other scholarly interests are learning across the lifespan, teacher professional development, and how the digital world impacts our lives. He is also involved in developing the P-TECH and Digital and Business Skills (DABS) new learning pathways for school and college students from disadvantaged areas in Ireland. He has recently written an opinion piece on *Transformative Learning and Climate Change* for the Irish Times.

Deirdre Tinnelly is the Research Assistant for the COALESCE-funded Professional Identity for Khmer Teachers (PIKT) project. Prior to this, she worked as the Education Specialist for NCI's education programmes. Alongside her experience in NCI, she has over a decade of teaching experience across primary schools in England and Ireland. As Assistant Headteacher, she designed and coordinated training for student teachers and newly qualified teachers. In 2023, Deirdre earned a Master of Arts in Educational Practices at NCI. Her dissertation explored the lived experiences of initial teacher education mentors in the further education and training sector in Ireland. Additionally, she holds a Postgraduate Certificate in Business Management, a Postgraduate Certificate in Leadership, and a Postgraduate Certificate in Education. Her early career was in digital marketing.

Siobhán Canavan and Anna Barr
Centre for Education and Lifelong Learning

Experiential Learning: The Realm of Learning and Connection through ECEC Field Visits

Abstract:
According to Campbell et al. (2021), field visits allow students to apply classroom knowledge in real-life contexts. Contemporary thinkers such as Manner (2018), Behrendt & Franklin (2014), Bowen (2014), and Kennedy (2014) suggest that students' retention of classroom-based knowledge increases during field visits. Additionally, Kuchel et al. (2015) contend that students' deeper engagement in learning fosters responsible attitudes and positive behaviours towards learning. Despite the potential for positive outcomes, the success of field trips is not guaranteed (Behrendt & Franklin, 2014). This presentation will present small-scale survey research that explores experiential learning and the impact of early childhood education and care (ECEC) field visits on 1st-year ECEC students' learning. The discussion will encompass findings from the literature review, details of the research design, methodology, and the subsequent data analysis. The presentation will also present initial findings from the learners' perspectives on their ECEC field visit experiences and insights from service providers. Ethical approval was granted from the National College of Ireland. This study's findings will interest Further Education and Higher Education programmes, workforce development professionals, learners, and community engagement stakeholders.

Biographies:
Siobhan Canavan is an Adjunct Assistant Professor at the NCI, and a part-time Assistant Lecturer at SETU. Siobhán has expertise in early childhood education and care and special and inclusive education. She was previously the owner/manager of The Montessori Academy, Kilkenny and taught for Kilkenny Carlow Education and Training Board. She holds a Montessori Diploma from MEC, a BA (Hons) in ECEC and an MA in Teaching and Learning in Further and Higher Education from SETU. She is in her final year of a Doctor of Education at DCU. Siobhán's research interests include Universal Design for Learning, ECEC, inclusive pedagogical practices, inclusion, professional learning and development, and Q methodology.

Anna Barr is an Assistant Professor and Programme Director of the BA Hons in Early Childhood Education and Care (ECEC) at the National College of Ireland. Her areas of teaching include supervised placement practice, early childhood curriculum, pedagogy, play and creativity. Anna is completing her Doctor of Education with Dublin City University and has a Masters in Teaching and Learning for Further Education (NCI, Dublin) and a BA (Hons) in ECEC (Carlow IT). Anna's research interests include digital play in ECEC and professional development for early childhood educators.

Jane Sheridan, Emre Kavak and Mark Igushkin
School of Computing

EngageSLT: From challenge to solution

Abstract:
Speech, language, and communication needs are the most common childhood disability with prevalence rates of 7-10% reported for preschool children rising to as high as 50% of all children in areas of social disadvantage. Children with poor vocabulary are twice as likely to be unemployed as adults. Speech and language therapy has demonstrated effectiveness in supporting children's speech and language development both in children with typical development and in children with disabilities. Utilising a Design Thinking methodology, a comprehensive stakeholder process was undertaken. A total of 120 stakeholders participated, including parents of children who have attended speech and language therapy, speech and language therapists, health service managers and other related professionals. Content analysis was used to develop a list of Needs Statements. Twenty percent of participants completed a needs statement ranking to identify the highest priority needs across stakeholders. Through the prioritisation process, enhancing communication between families and therapists outside the clinic setting was identified as a high priority need that potentially could be well supported through technology. This talk highlights the Design Thinking approach that was followed under the national challenge funded project to address these societal issues through the introduction of software solution stack.

Biographies:
Jane Sheridan is a registered speech and language therapist. Jane is a research assistant on the Enhancing Speech and Language Therapy through Artificial Intelligence (ESTA) project in the NCI. Jane is completing a master's through research in Clinical Speech and Language Studies, in Trinity College Dublin. Her present research is investigating children's perspectives of home practice in paediatric speech and language therapy.

Emre Kavak is a graduate from the NCI with a Higher Diploma in Computing Science, and he holds a Bachelor's Degree in Aviation Management. Emre works as a Full Stack Developer on the Enhancing Speech and Language Therapy through Artificial Intelligence (ESTA) project at NCI, where he focuses on developing mobile applications for the project.

Mark Igushkin is a Full Stack Developer with a degree in Computer Science from the NCI. Mark is working on the project EngageSLT, and focuses on developing practical solutions to improve application performance. Mark is passionate about the latest industry trends and continuously enhancing his skill set, like finding innovative ways to solve complex problems.

Dr Rohit Verma
School of Computing

Honey2Fish - A Hybrid Encryption Approach for Improved Password and Message Security

Abstract:
Nowadays, there is an upsurge in reliance on web usage. Many of these web applications make use of password-based authentication. Ensuring a secure password protection mechanism is crucial for maintaining the overall confidentiality of computer systems. Despite extensive research on creating strong, reliable, confidential passwords, several challenges still exist. One such issue is weaker password-based encryption (PBE). This paper proposes Honey2Fish, a hybrid encryption approach that uses Honey encryption (HE) and Twofish for enhanced password and message security. A two-layer protection mechanism protects both the privacy of credentials and the messages. This approach provides improved performance and enhanced security while keeping the system's overall complexity low for securing passwords and messages. The proposed solution uses honeywords to give bogus but justified data while encrypting with an incorrect password to safeguard against brute force attacks. This paper further examines contemporary honeyword creation algorithms and proposes a user-centric approach to avoid human error while entering passwords. The validation of the research suggests that Honey2Fish is useful and secure in real-life password-based authentications. The result shows Honey2Fish has an average of 50% avalanche property with good throughput.

Biography:
Dr. Rohit Verma is an Assistant Professor at the School of Computing, National College of Ireland. Previously, he was a post-doctoral researcher with Insight SFI Research Centre for Data Analytics, Dublin, Ireland. He was also a visiting researcher at Performance Engineering Laboratory, Dublin City University (DCU), Ireland. He was an active researcher for the EU-funded Horizon 2020 project TRACTION. Dr. Verma obtained his PhD for his research on service-oriented architecture in resource-constraint environments. He was awarded M.Tech. and B.Engg. degrees in Computer Science & Information Security, and Information Technology. His research interests include Legal AI, Cyber Security, autonomous and adaptive systems in service computing, cloud computing, quality-oriented and performance-related issues of adaptive delivery, and computer networks.

Keynote Speaker: Prof Marco Ruffini
School of Computer Science and Statistics, Trinity College Dublin,
The University of Dublin

Harnessing AI in Optical and Wireless Networks

Abstract:

In this talk, Prof. Ruffini will explore the innovative integration of AI control in the design of optical and wireless networks. Highlighting his cutting-edge research within the Open Ireland infrastructure, he will present compelling examples of how AI is being utilized to address critical challenges. Attendees will gain insights into experimental activities demonstrating the transformative potential of AI in enhancing network performance and reliability.

Biography:

Prof. Marco Ruffini received his M.Eng. in telecommunications engineering in 2002 from Polytechnic University of Marche, Italy. After working as a research scientist for Philips in Germany, he joined Trinity College Dublin in 2005, where he received his Ph.D. in 2007.

He is currently full professor at TCD. He is Principal Investigator (PI) of both the CONNECT Telecommunications Research Centre at TCD, and the IPIC photonics integration centre headquartered at the national Tyndall institute. Prof. Ruffini is currently involved in several Science Foundation Ireland (SFI) and H2020 projects, leads the Optical and Radio Network Architecture group at Trinity College Dublin.

His main research is in the area of 5G optical networks, where he carries out pioneering work on the convergence of fixed-mobile and access-metro networks, and on the virtualisation of next generation networks, and has been invited to share his vision through several keynote and talks at major international conferences across the world and the OpenIreland beyond 5G testbed research infrastructure. He has recently started working also on quantum networking where he is collaborating with the US Centre for Quantum Networks (CQN).

He authored over 200 international publications, 10 patents, contributed to industry standards and secured research funding for over € 14 milion, and contributed is novel virtual Dynamic Bandwidth Allocation (vDBA) concept to the BroadBand Forum standardisation body.

Website with more information on publications, grants, and service to the discipline:
https://marcoruffini.com/

Tamara Malone
Norma Smurfit Library

"They'll remember how you made them feel": Are public libraries in Ireland meeting the needs of Irish Travellers?

Abstract:
Many of the disadvantages Irish Travellers face may be countered by public library provision; we therefore decided to examine the extent to which the information needs of this group are met by Irish libraries, in a qualitative and exploratory project in which five Irish Travellers, two settled persons working with Traveller organisations, and a public library professional were interviewed. Interview findings along with an analysis of Irish public library documentation and a literature review were analysed thematically, these themes consisting of (1) misperceptions of the library service, (2) the relationship between service provider and user, (3) outreach activities, (4) cultural preservation and representation, and (5) literacies. Among the most striking of findings are that the majority of Travellers are unaware of the services that are available; there is a lack of Traveller representation in collections and programming; and such representation is desired by the community on the basis that it may challenge negative perceptions of them among settled people. Irish Travellers are not, according to findings, engaging with library services, and misperceptions may be a partial cause of this. A number of suggestions are broached, many involving marketing and outreach activities and the inclusion of Travellers in collections and programming.

Biography:
Tamara Malone works in the area of Online Virtual Library Support at NCI Library, having started in NCI as a Library Assistant in 2022. She graduated from the Master's in Library and Information Studies programme at UCD the same year, and wrote a thesis examining the extent to which the information needs of Irish Travellers are met by public libraries in the Republic of Ireland. An iteration of this research was recently published in An Leabharlann: The Irish Library. Tamara is interested in accessibility and universal design, and has recently been helping in the development of institution-wide Academic Integrity policies, and Open Access agreements between the library and academic publishers. She also manages NORMA, NCI's Institutional Repository, NCI Archive, and NCI's Past Examination Papers Database.

Dr Alba González–Cebrián, Michael Bradford, Dr Adriana E. Chis and Prof Horacio González–Vélez
Cloud Competency Centre

FAIR Versioning of Datasets

Abstract:
This presentation introduces the findings from Nature's Scientific Data paper "Standardised Versioning of Datasets: a FAIR–compliant Proposal". It entails a standardised dataset versioning framework for improved reusability, recognition and data version tracking, facilitating comparisons and informed decision-making for data usability and workflow integration. The framework adopts a software engineering-like data versioning nomenclature ("major.minor.patch") and incorporates data schema principles to promote reproducibility and collaboration. To quantify changes in statistical properties over time, the concept of data drift metrics (d) is introduced. Three metrics (d_P, $d_{E,PCA}$ and $d_{E,AE}$) based on unsupervised Machine Learning techniques (Principal Component Analysis and Autoencoders) are evaluated for dataset creation, update, and deletion.

Biographies:
Dr Alba González–Cebrián is a Research Associate at the Cloud Competency Center, NCI. She earned an FPI grant for her Ph.D. in Statistics at the Universitat Politècnica de València in 2018. Her expertise lies in developing innovative solutions for Exploratory Data Analysis and integrating Machine Learning tools into healthcare environments.

Michael Bradford is an Assistant Professor in the School of Computing, NCI. Extensive ICT project experience in the financial sector prior to joining NCI. Extensive software development experience across a wide range of technology stacks and programming environments. Qualifications include MSc in Mathematics, University College Dublin, and BSc (Hons) in Mathematics, First Class Honours, D.I.T., Kevin St., Dublin. Extensive experience in the development of academic programmes.

Dr Adriana E. Chis is an Associate Professor in the School of Computing, NCI. She received a Ph.D. in Computer Science from University College Dublin in 2013. During her Ph.D. she collaborated with the IBM Software Group, Dublin, and the Intelligent Application Analysis Group, IBM T.J. Watson Research Center, USA. Her research interests are in software systems, programming languages, program analysis, compilers, runtime systems, and cloud computing. Her ORCiD is https://orcid.org/0000-0002-8700-4914.

Horacio González-Vélez is a Professor of Computer Systems and Founding Head of The Cloud Competency Centre at NCI. Prior to NCI, he lectured at Robert Gordon University after completing his Ph.D. and postdoc in Informatics at the University of Edinburgh. He spent a decade working in the ICT industry at different companies including Silicon Graphics and Sun Microsystems. His publication record includes over 80 peer-reviewed works on high-performance computing, data intensive applications, and cloud infrastructures. At NCI, he developed the Cloud Competency Centre industry-academia collaborations, securing over 3.5m Euros in direct funding within projects worth over 50m Euros. He is a senior member of the ACM, a Fellow of the RSA, and the UK's Higher Education Academy. His ORCiD is https://orcid.org/0000-0003-0241-6053.

Dr Jorge Mario Cortes Mendoza
Cloud Competency Centre

Privacy-Preserving Logistic Regression for Cloud Environments

Abstract:

Cloud environments simplify the development and deployment of Machine Learning (ML) models by providing the infrastructure and tools necessary for data analytics. However, their evaluation in a shared environment increases the possibility of information leaking because data is typically decrypted for processing when stored as ciphertexts. Homomorphic Encryption (HE), secure Multi-Party Computation (MPC), and Federated Learning (FL) are three main directions to provide security and privacy-preserving in cloud environments by addressing vulnerabilities in data processing. HE allows the performance of certain mathematical operations directly on the ciphertext. MPC distributes a secret between several parties without offering enough information to disclose it. FL trains a model with the private data of different users without exchanging the data itself. All the approaches guarantee that a remote, untrusted party will not learn anything about the input or output of the computation by delegating processing. However, despite continuous improvements in the three areas, several limitations in accuracy and time restrict their applicability. In this talk, we present the latest advances in privacy-preserving LR for processing confidential data using HE, MPC, and FL: algorithms, evaluation metrics, used datasets, approximation functions, and implementation characteristics, among others.

Biography:

Dr Jorge Mario Cortes-Mendoza received his bachelor's degree in Computer Science from the Autonomous University of Puebla (BUAP) in 2008 and his master's degree and PhD in Computer Science from the CICESE Research Center in 2011 and 2018, respectively. He carried out research stays at the Georg-August University in Göttingen, Germany, and the University of Luxembourg, Luxembourg. He was a postdoctoral researcher at South Ural State University (SUSU) in Russia and the University of Luxembourg. He worked as an assistant professor at the Polytechnic University of Amozoc (UPAM) and the Metropolitan Polytechnic University of Puebla (UPMP) in Mexico. Jorge Mario Cortés-Mendoza is a postdoctoral researcher at the Cloud Competency Centre, National College of Ireland. He has been a member of the National System of Researchers in Mexico (SNI) since 2020, and his main interests include cloud computing, load balancing, distributed computing, security, scheduling, and artificial intelligence.

Jorge's research profile is available at https://sites.google.com/view/jmcortesmendoza.

Siobhán Canavan
Centre for Education and Lifelong Learning

A Q Methodology Study: Exploring Early Childhood Teachers Subjective Views on Universal Design for Learning (UDL) in Irish Pre-Primary Schools

Abstract:

The National Council for Special Education (NCSE) urged schools to "progress" by reflecting on classroom practices catering to all children's needs, including those with individual requirements. However, equipping teachers to address diverse needs proves challenging, requiring a re-evaluation of their ideologies (Milner, 2010) and tackling inequality (Quinn, 2020). UDL has emerged as a critical pedagogical approach that fosters inclusive and equitable education amidst student diversity (Flood & Banks, 2021). This research explores early childhood teachers' subjective views on implementing UDL as a pedagogical tool to bridge educational disparities using Q methodology (henceforth Q). There is no evidence in the Irish context to draw upon and identify early childhood teachers' views on implementing UDL in pre-primary schools. Q, introduced by William Stephenson in the 1930s (Watts & Stenner, 2012), is a mixed-method approach that explores subjectivity while upholding the transparency and rigour of quantitative data (Baker et al., 2006). This research holds promise for the early childhood education and care community by offering insights that can foster inclusive learning environments. Its findings may also shape education policy and significantly contribute to professional knowledge and practice in the education sector.

Biography:

Siobhan Canavan is an Adjunct Assistant Professor at the NCI, and a part-time Assistant Lecturer at SETU. Siobhán has expertise in early childhood education and care and special and inclusive education. She was previously the owner/manager of The Montessori Academy, Kilkenny and taught for Kilkenny Carlow Education and Training Board. She holds a Montessori Diploma from MEC, a BA (Hons) in ECEC and an MA in Teaching and Learning in Further and Higher Education from SETU. She is in her final year of a Doctor of Education at DCU. Siobhán's research interests include Universal Design for Learning, ECEC, inclusive pedagogical practices, inclusion, professional learning and development, and Q methodology.

Anna Barr
Centre for Education and Lifelong Learning

Coding Connections: Early Childhood Educators Guiding Computational Thinking with Robotic Play

Abstract:
Recent research and policy recognise that young children attending Early Childhood Education and Care (ECEC) benefit from opportunities to engage with digital technologies and develop their computational thinking, as part of developing digital literacy needed for essential 21st century skills and citizenry and to reduce digital divide inequalities. This Doctor of Education (EdD) research study explores a design-based research intervention to support early childhood educators to co-design purposeful play experiences for young children (3-5 years old) using programable robotic kits, with the aim of supporting their development of computational thinking.

The research is situated in the field of ECEC in Ireland as part of a developing policy context that acknowledges the possibilities for young children to engage with digital technologies and the challenges for early childhood educators due to gaps in knowledge, practices and values needed to embed digital technologies such as programmable robotic kits and computational thinking into their ECEC practice. The presentation offers an overview of the research study and data gathered and will discuss preliminary findings and possible implications for ECEC policy and practice.

Biography:
Anna Barr is an Assistant Professor and Programme Director of the BA Hons in Early Childhood Education and Care (ECEC) at the National College of Ireland. Her areas of teaching include supervised placement practice, early childhood curriculum, pedagogy, play and creativity. Anna is completing her Doctor of Education with Dublin City University and has a Masters in Teaching and Learning for Further Education (NCI, Dublin) and a BA (Hons) in ECEC (Carlow IT). Anna's research interests include digital play in ECEC and professional development for early childhood educators.

Dr David Mothersill

Psychology Department

Knowledge, attitudes, and behaviours towards schizophrenia, bipolar disorder, and autism in Ireland: A population-representative study in 847 participants
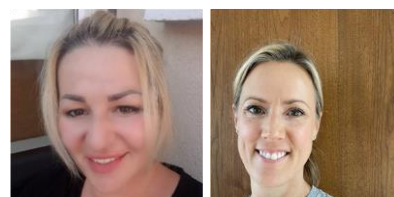
Abstract:

Examining the relationship between pro-inflammatory cytokine interleukin-6 (IL-6) and brain function during social cognition in individuals with schizophrenia and controls: A functional magnetic resonance imaging study.

Biography:

Dr David Mothersill is Associate Professor in Psychology and Co-Director of the Stigma and Mental Health Ireland Laboratory (SAMI) at National College of Ireland. David was awarded a PhD from Trinity College Dublin in 2014 and went on to lecture in the University of Galway, where he co-developed the successful MSc in Clinical Neuroscience in 2016. David's research uses neuroimaging and cognitive testing to better understand conditions such as schizophrenia. This research has led to 45 peer-reviewed papers published in the top scientific journals in the world, including Nature (impact factor 64.8), and over €160,000 in grant funding from Science Foundation Ireland, the Irish Research Council, Royal Irish Academy, and ESTHER Ireland. David has presented this research at conferences around the world, including Kyoto, Japan, and Oxford University. David's first app, cTOM, a test to measure social cognition, was released on the Apple App Store in 2022. David's research profile is available at https://orcid.org/0000-0003-3013-4088.

Ramona Mihalka and Nikky Ryan

Early Learning Initiative

Keeping the Connection-Stretch Graduate programme

Abstract:

The Early Learning Initiative (ELI) works in partnership with local communities in an area of socio-economic disadvantage to address the problem of educational underachievement. Stretch Graduate is one of ELI's intervention programmes offered to families with children aged 4-6. The programme consists of regular home visits or check in phone calls and aims to improve children's holistic development by empowering their parents with confidence and knowledge that can support their children' education. Stretch Graduate was developed from a Community Action Research (CAR) project exploring parents' perspectives of their family's wellbeing during the COVID-19. Through this research ELI devised new ways to collaborate with families, to improve the supports they previously provided. ELI uses the CAR approach to observe, reflect, act, evaluate and modify its projects which enables a continuous improvement (McNiff, 2010). The compiled findings, over the last three years, demonstrates success and have informed the evolution of the programme to where it is today and continue to guide its future. The programme evolves to meet the ever-changing needs of family's whist recognizing the importance of incorporating the UN's Sustainable Development Goals and maintaining strategic relevance for NCI. The study is part of ELI's CAR approach, which has been approved by the National College of Ireland's Ethics Committee.

Biographies:

Ramona Mihalka has joined the Early learning Initiative in December 2021 as a Programme Coordinator. Ramona holds a BA in Early Childhood Education Studies from London Metropolitan University, UK, and Diploma in Instrumental Teaching from the Royal Irish Academy of Music, IRE, both contributing to a better understanding in relation to the importance of inspiring and guiding young minds towards academic achievements with a touch creativity and adaptability along the way. Ramona has co-authored research projects, conference bulletins and presentations at CARN 2023, with Kate Darmody and CARN 2024, with Alex Alcala, demonstrating the importance of Community Action Research in the continuous development and future evolution of ELI's programmes. In collaboration with the Early Learning Initiative's research team, Ramona has contributed to the development and implementation of research tools for programmes and data collection.

Nikki Ryan recently joined the Early Learning Initiative (ELI) as a Researcher, bringing a fresh perspective and a passion for early years education. Nikki holds a Master's degree in Library and Information Science from San José State University, CA, equipping her with a strong foundation in research and information management. Nikki has been actively involved with ELI since December 2023, initially volunteering and contributing significantly until May 2024. Nikki authored a paper for ELI on incorporating longitudinal research into program delivery in a sustainable way, demonstrating a deep understanding of utilising current resources more effectively. Nikki has developed comprehensive overviews of existing research on the ParentChild+ and Stretch Graduate programs, providing valuable insights for future initiatives.

Dr Michelle Kelly and Dr Caoimhe Hannigan
Psychology Department

Findings from the IRC-Funded Study on Examining Factors Influencing the Implementation of Evidence-Based Interventions for People with Dementia in Ireland

Abstract:
Cognitive stimulation therapy (CST) is the only evidence-based intervention that improves cognition and quality of life for people with mild-moderate dementia. Although over 400 healthcare practitioners are trained in CST, an 'implementation gap' means that CST is not routinely available. We examined the facilitators and barriers to the implementation of CST in Ireland. In phase 1, trained CST practitioners (n= 75) completed a survey assessing implementation, acceptability, and perceived efficacy of CST. Statistical analysis demonstrated that 54.8% of practitioners had run CST following training; the more effective practitioners thought CST was, the more likely they were to run CST (p=0.006); and practitioners would run a greater number of CST groups when they saw the benefits first-hand (p=0.01). In phase 2, qualitative interviews examined barriers to CST and strategies to overcome barriers. Interviews with dementia policy professionals and healthcare professionals (n=10), family care partners (n= 5) and people living with dementia (n=5) were analysed using a thematic framework analysis. Results showed that participants were supportive of increased delivery of CST; improving awareness of CST and accessible information is important; and a lack of resources like staff and funding is a barrier to availability. This research improves our understanding of factors affecting CST implementation in Ireland. Recommendations have been made to inform clinical and policy decisions; we are liaising with the HSE's National Dementia Office (NDO) to advise on national implementation plans for CST in Memory Clinics countrywide.

Biographies:
Dr Michelle Kelly is an Associate Professor of Psychology at NCI and co-director of the ProBrian Lab. She has an honours degree in Psychology and a doctorate in Behaviour Analysis and Therapy from Maynooth University. She is also a Board-Certified Behaviour Analyst - Doctoral level (BCBA-D) and an Internationally Accredited Cognitive Stimulation Therapy trainer (University College London). She is the Chair of the Psychological Society of Ireland's (PSI) Division of Behaviour Analysis and sits on the PSI undergraduate accreditation committee. Her research focuses on early interventions for people with dementia and relational frame theory. She is a PI on research projects founded by the Irish Research Council and the Alzheimer's Society of Ireland.

Dr Caoimhe Hannigan completed her PhD in Psychology at Trinity College Dublin. Caoimhe has significant experience in the design and implementation of research related to cognitive function, loneliness, and health and well-being in older populations. Her key research interests include cognitive ageing, modifiable risk factors for chronic health conditions and dementia, loneliness and its impact on health, brain health and dementia prevention, successful ageing, and interventions to support health and well-being in older adults. Caoimhe has received over €200,000 in research funding and has over 30 peer-reviewed publications in the field of psychology of ageing. Caoimhe is co-director of the ProBrain Research Laboratory at National College of Ireland.