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Postnominal Explanations:

MRIA – Member of the Royal Irish Academy
FIEE – Fellow of the Institute of Electrical and Electronics Engineers
FAAIA – Fellow of the Asia-Pacific Artificial Intelligence Association
FICS – Fellow of the Irish Computer Society
PFHEA – Principal Fellow of the Higher Education Academy

CAREER PROFILE (Education and Employment)

- PhD (Computer Science) University College Dublin (1983-1987).
- M.Sc. (research) University College Dublin (1980-1982).
- B.Sc. (hons) University College Dublin (1976-1980).

- Appointed member of the Government of Ireland Advisory Council on AI (2024-2026).
- Visiting Professor, Universiti Tenaga Nasional (UNITEN), Malaysia (2023-2025).
- Founding Director, Insight Centre for Data Analytics, Dublin City University, (2013-2018).
- Deputy Director, CLARITY SFI Centre for Sensor Web Technologies, (2007-2012).
- Head of School of Computing (1999-2002 and 2019-2020), Dean of Faculty (2000-2002).
- Full Professor, Dublin City University (1997-present) – *at the time of appointment I was the youngest and I am now the 2nd longest serving current Prof. of Computing in Ireland.*
- Visiting Researcher, Université Josef Fourier, Grenoble, France (1995).
- Senior Lecturer, Dublin City University (1992-1997).
- Lecturer, Dublin City University (then NIHE, Dublin) (1987-1992).

A. Key Achievements in the Generation of Knowledge

1. My research outputs including publications, patents, invention disclosures and projects have collectively been recognised through multiple awards some of which I list here. The most recent is that in 2022, 2023 and again in 2024 I was noted by Research.COM as a leader for the discipline of Computer Science in Ireland, based on data combined from multiple data sources including OpenAlex and CrossRef. In 2023 I became a Fellow of the Asia-Pacific Artificial Intelligence Association (AAIA). In 2022 I was the winner of the ACM SIGMM (Special Interest Group in MultiMedia) Award for Outstanding Technical Contributions to Multimedia Computing, Communications and Applications. This is my most prestigious discipline-specific recognition. In 2018 I was jointly awarded the Mark Everingham Prize by IEEE for contribution to video processing and in 2017 I was awarded the Niwa-Takayanagi Prize by the Institute of Image Information and Television Engineers, Japan for *"outstanding achievements in the field of video information media".* Also in 2017 I was elevated to Fellow of the IEEE for *"outstanding contribution to multimedia indexing and retrieval".* In 2015 I won the Royal Irish Academy Gold Medal for Engineering Sciences. This is awarded once every 3 years and *"acclaims Ireland's foremost thinkers in the humanities, social sciences, physical & mathematical sciences, life sciences, engineering sciences and the environment & geosciences"* and is the most prestigious national recognition in Ireland. I was the winner of Tony Kent Strix award in 2011 from the UK e-Information Society for *"sustained contributions to the field of indexing and retrieval of image, audio and video data"* and in 2009 I won the Dublin City University (DCU) Educational Trust Leadership Circle award for *"world-leading work in the area of digital video processing*". All of these mark my achievements and recognition

in the generation of knowledge and almost all of these are in the area of artificial intelligence.

2. In recognition of my scholarly work, I was admitted to membership of the Royal Irish Academy, Ireland's highest academic distinction in 2013 for *"world-class contribution to science".* I chaired the Academy's *Engineering and Computer Sciences* Committee for 4 years (2014-2018) and I was a member of the Academy's *Membership Committee* for 3 years.

3. It is difficult to list key achievements in publication without referring to the numbers so let me point to them here. I have more than 700 refereed publications, and over 25,500 citations to my work on Google SCHOLAR (6,223 since 2021), and an h-index of 75 (h-index = 34 since 2021). My i10-index on SCHOLAR is 386. The best source for my list of actual publications is on Google SCHOLAR but some relevant ones are listed below. ARNETMINER mines deep knowledge from scientific networks and publications. It has (automatically) identified 200 different domains (topics) based on an author-conference publication-topic clustering model and in 2020 it identified me as the 17th ranked active inventor, globally, for the topic *Information Retrieval/Probabilistic Indexing* and the 11th ranked active inventor for the topic *Large Scale Video Retrieval*.

4. My research funding history is that I have been personally responsible for securing over €14.17M in funding for my own research, i.e. my part of larger grant awards, from Irish funding agencies (Science Foundation Ireland, Enterprise Ireland, Marine Institute, Environmental Protection Agency, the Irish Research Council), directly from industry Samsung (Korea), QinetiQ (UK), Microsoft Research (UK), Google (US), Fujitsu (Japan), FXPAL (US), Synchronoss Technologies (US), Aviva Insurance (Ireland), SAP (Ireland), DAVRA (Ireland), Fitbit (UK), Huawei (Ireland), TNB (Malaysia) and others, from European Union sources including FP5, FP6, FP7, H2020, EU Regions of Knowledge, Marie Curie, from the UK Medical Research Council, the Health Research Board of New Zealand, the European Space Agency, the Australian Research Council, the National Institute of Health (US), the EU Marie Curie program, the Enterprise Ireland Disruptive Technology Innovation Fund and the National Institute for Standards and Technology (US).

B. Key Achievements in the Development of Individuals and Collaborations

1. I have supervised more than 50 PhD and research Masters students to completion as supervisor in DCU and in other Universities in Ireland (Trinity College Dublin, University of Galway) and abroad. Several of them are now Professors at places including Oxford University, in Malaysia, in Norway, and in Ireland. Others work in companies including Google, Meta, Yahoo!, Microsoft Research, Amazon, SAP, IBM, etc. and in start-up businesses in Ireland and abroad. I have examined over 45 PhD or Habilitation a Diriger des Recherches (HDR) theses external to my own University, including Universities in Helsinki (Aalto), Southampton (x2), Putrajaya (Malaysia), Leiden (x2), Amsterdam (UvA x2), Limerick, Khalifa Univ. of Science and Technology (UAE) (x2), RMIT Univ. (Australia), Trinity College Dublin (x2), Glasgow, Oulu (x2), Luleå, Surrey, Univ. College Dublin (x2), Univ. Josef Fourier (Grenoble) (x2), Australian National, Ulster (x2), Twente (x2), and Univ. College London.

2. Over the last 2 decades I was the co-founder of various research centres, the Adaptive Information Cluster, the CLARITY Centre for Sensor Web Technologies, its successor CLARITY II, and the Insight Centre for Data Analytics respectively. These have developed the research careers of many hundreds of individuals. In 2018 I was a co-founder of the Centre for Researcher Technology in Digitally Enhanced Reality which funded more than 100 PhD students in 5 Universities across Ireland. In 2005 I was one of 6 co-applicants in a successful consortium which led to Ireland's National Digital Research Centre (NDRC) which ran the national startup accelerator programme for hundreds of tech entrepreneurs over a 15 year period – that impacted the lives and careers of thousands of people. I list these as examples of leadership in the development of individuals and not as funding successes.

3. In 2021 I was awarded Principal Fellowship of AdvanceHE, the Higher Education Academy (HEA), demonstrating my personal commitment to professionalism in teaching and learning in higher education and my use of innovative AI technologies in practice. I was the first PFHEA in my University and there are only about 15 Principal Fellows of the HEA in Ireland across all disciplines, and only a few hundred globally. I am the only PFHEA in Computer Science/Computing who is active in teaching in Ireland. This international award speaks to my leadership in teaching innovation and in the development of individuals through those teaching innovations.

C. Key Achievements Supporting Broader Society & the Economy

1. I have served as a member of the Board of the Irish Research Council (IRC) (2012-2015, 2015-2018) and the Irish Research Council for Science, Engineering and Technology, (2011-2012). I believe this makes me the longest-serving member of the IRC and its precursors. These were all Ministerial appointments. My role was as a contributor to determining and overseeing the policy for disbursement of over €200M of research funding to support excellent researchers in Ireland across all disciplines. During my Council Board membership we developed and introduced new funding and awards/recognition programs such as IRC researcher of the year, schemes to develop and support ERC awardees, extending the enterprise partnership program to include collaboration with government agencies, attendance by IRC awardees at the annual Lindau Nobel Laureate Meeting awards, and more.

2. I was a Member of the inaugural Scientific Committee of the EU COST funding programme (European Cooperation in Science and Technology) (2015-2018). COST had a budget of €300m in Horizon 2020 (2015-2018) and more than 340 running Actions or networking projects, bringing together over 45,000 researchers, engineers and scholars, from academia and from industry, from throughout Europe and beyond. The scientific committee advises the COST Association on procedures related to the submission, evaluation, and selection of COST Action proposals. The Committee also oversees the monitoring and final assessment of all COST Actions.

3. I am a founding member of the Editorial Board of *Foundations & Trends in Information Retrieval* (2006-2014), a founding member of the Editorial Board of the *ACM Journal on Computers and Cultural Heritage* (2006-2015) and a founding member of the Editorial Board of the *Information Retrieval Journal* (1998-2007). I was a member of the editorial Boards of several other journals including *Information Processing and Management* (2000-), the *Journal on Information Retrieval and Knowledge Management* (2012-), the *International Journal on Digital Libraries* (2002-2011) and the *ACM Transactions on Information Systems* (1996-2004).

4. I have a national profile as a media contributor to the public understanding and discussion of science topics, in particular Artificial Intelligence, data science and technology in general. Over the last 8 years (2017-2024) I have been interviewed on Irish national radio and TV on almost 40 occasions. During 2024 I had a regular slot every 5 or 6 weeks on the RTÉ (the national broadcaster) radio morning chat show with an audience of over 330,000 listeners. During these interviews I talked about the most recent developments in AI to a general audience, covering things like ChatGPT, virtual reality, computer vision, where AI is all around us, etc.

D. Key Achievements Supporting the Research Community

1. I review extensively for many organisations, almost always internationally. I have reviewed research project proposals for research funding agencies including research councils in Australia, Austria, Belgium, France, Hong Kong, Ireland, the Netherlands, New Zealand, Portugal, Romania, Singapore, Switzerland, EPSRC (UK), Royal Society of Edinburgh, European Research Council, Niels

Stensen Stichting (the Netherlands), Dutch Technology Foundation (STW) (the Netherlands), IWT-Vlaanderen, the Nuffield Foundation, the National Science Foundation (US), Ontario Research Fund (Canada), and the AHRB (UK). I have reviewed the operation and outputs of research centres including the Centre for Security, Reliability and Trust (SnT) in Luxembourg (2022), Institut Eurecom, Sophia Antipolis, France, the School of Computer Science at the National University of Singapore and the School of Computing at the University of Newcastle, UK. I have been a member of assessment committees for national funding agencies such as the Dutch NWO Large Scale Infrastructures program in 2020 and 2021 which had a budget more than €250M and the assessment of all Computer Science Departments across all Dutch Universities for the Dutch government, in 2022. I have reviewed papers for more than 150 conferences and for 47 different journals. For more than 10 years I was a member of the International Advisory Committee (IAC) of the COMunnications INformation Science Laboratores (COMINLabs) Research Centre in Rennes, France.

2. Between 2017 and 2021 I was the elected chair of ACM SIGMM (Special Interest Group in Multimedia), overseeing 6 international multimedia conferences and more than two dozen workshops that SIGMM sponsors annually with a cumulative attendance of +2,500. During my 4 years as chair I set up and I still run a student travel and a carer support funding scheme across all conferences which has provided funding to +350 students globally, and a Test of Time best paper award. I initiated the addition of 2 annual conferences, MULTIMEDIA Asia and Mile High Video to the annual ACM calendar.

3. In 2001 I was joint (and founding) coordinator of TRECVid, a large-scale, global benchmarking activity which involved literally thousands of researchers from across the globe in coordinated research on problems in video search. TRECVid remains the largest worldwide benchmarking evaluation on content-based analysis of multimedia. It has also become the template for multiple subsequent benchmarking activities in the wide multimedia field. TRECVid commenced in 2001

E. Selected Senior-Authored Publications

1. Smeaton, AF (2023). Teaching Health Literacy and Digital Literacy Together at University Level: The FLOURISH Module. Health Education & Behavior. 50(5):622-628. https://doi.org/10.1177/10901981231163609

   Over the last 5 years I have an interest in student health, wellness and wellbeing and this paper is a report on my initiative to create a taught module combining health and digital literacy. The module has been delivered to 1,300 undergraduate students across my University and is now licensed to another University who make it available to trainee nurses nationwide in Ireland.

2. Doherty AR, Hodges SE, King AC, Smeaton AF, Berry E, Moulin CJ, Foster, C. (2013). Wearable cameras in health: the state of the art and future possibilities. *American journal of preventive medicine*, *44*(3), 320-323. https://doi.org/10.1016/j.amepre.2012.11.008

   Another multi-disciplinary collaboration with researchers in Microsoft Research and Oxford University reporting our work on the use of wearable cameras to support people across a range of human conditions from dementia to mobility issues, and from smoking cessation to exposure to fast food advertisements.

3. Signal LN, Smith MB, Barr M, Stanley J, Chambers TJ, Zhou J, Duane A, Jenkin GLS, Pearson AL, Gurrin C, Smeaton AF, Hoek J, Ní Mhurchu C. (2017). Kids' Cam: an objective methodology to study the world in which children live. *American Journal of Preventive Medicine*, *53*(3), e89-e95. https://doi.org/10.1016/j.amepre.2017.02.016

This paper has important impact globally because it is cited in policy documents in Australia and New Zealand on environmental factors impacting children including passive smoking and fast food advertising.

4. Raju H, Sharma A, Smeaton A, & Smeaton AF (2023). Automatic Detection of Signalling Behaviour from Assistance Dogs as they Forecast the Onset of Epileptic Seizures in Humans. The 38th ACM/SIGAPP Symposium on Applied Computing (SAC '23), March 27-April 2, 2023, Tallinn, Estonia. https://doi.org/10.1145/3555776.3577656

   This presents another of my cross-disciplinary works in this case with a charity, Dogs for the Disabled, and Epilepsy Ireland. The paper demonstrates the feasibility and accuracy of detecting spinning as a signalling behaviour by an assistance dog trained to scent the Volatile Organic Chemicals (VOCs) secreted prior to an epileptic seizure by its owner.

5. Smeaton AF, Over P, Kraaij W. (2006). Evaluation campaigns and TRECVid. In *Procs. of the 8th ACM international workshop on Multimedia information retrieval* (pp. 321-330). https://doi.org/10.1145/1178677.1178722

   My most-cited paper, the seminal paper describing the TRECVid benchmarking activity which I coordinated for 18 years. It continues to gather multiple citations each year.

6. Smeaton AF, Hu F. Periodicity Intensity Reveals Insights into Time Series Data: Three Use Cases. *Algorithms*. 2023; 16(2):119. https://doi.org/10.3390/a16020119

   This is a summary of applications of periodicity intensity from a time series. This is a novel data analytics technique which I have been developing since 2016, to a range of case studies.

7. Rhodes V, Maguire M, Shetty M, McAloon C, Smeaton AF. Periodicity Intensity of the 24h Circadian Rhythm in Newborn Calves Show Indicators of Herd Welfare. *Sensors*. 2022; 22(15):5843. https://doi.org/10.3390/s22155843

   This paper is the result of a collaboration with colleagues in veterinary science where the aforementioned periodicity intensity metric that I developed, revealed insights into herd behaviour. This an example of my inter-disciplinary work.

8. Le-Khac PH, Healy G, & Smeaton AF (2020). Contrastive representation learning: A framework and review. *IEEE Access*, *8*, 193907-193934. https://doi.org/10.1109/ACCESS.2020.3031549

   With a high number of citations in a short period since publication, my research has been developing machine learning innovations and applications for several years and this article is a review of some of them.

9. Gurrin C, Smeaton AF, Doherty AR (2014), "LifeLogging: Personal Big Data", Foundations and Trends® in Information Retrieval: Vol. 8: No. 1, pp 1-125. http://dx.doi.org/10.1561/1500000033

   This paper has become the go to reference for the topic of lifelogging, the recording of personal data for the exclusive use of the individual who recorded the data. The work on lifelogging in DCU which I initiated, has become world-leading.

I am a champion of open access in science and for almost 15 years I make all of my scholarly publications (+99% of them according to Google Scholar) available as open access. As a result of my leadership in embracing open access I give an annual induction talk to year 1 PhD students from across all Faculties in my University, on how open access works and its benefits.