

Preface: The 26th AIAI Irish Conference on Artificial Intelligence and Cognitive Science (AICS 2018)

Rob Brennan^{1*}, Joeran Beel^{2*}, Ruth Byrne³ and Jeremy DeBattista^{2*}

¹ Dublin City University, School of Computing, ADAPT Centre, Ireland

² Trinity College Dublin, School of Computer Science & Statistics, ADAPT Centre, Ireland

² Trinity College Dublin, School of Psychology and Institute of Neuroscience, Ireland

rob.brennan@dcu.ie, joeran.beel@tcd.ie, ruth.byrne@tcd.ie,
jeremy.debattista@adaptcentre.ie

Abstract. The 26th AIAI Irish Conference on Artificial Intelligence and Cognitive Science (AICS) celebrates its 30th anniversary in 2018 and is hosted by Trinity College Dublin on behalf of AIAI, the Artificial Intelligence Association of Ireland, on the 6-7th of December of that year. AICS features 29 presentations, 12 posters and 2 keynotes. Researchers from sixteen Irish institutions and companies submitted to AICS 2018. The paper acceptance rate was 62%, and the most submissions were made by University College Dublin (UCD), Trinity College Dublin (TCD), Dublin Institute of Technology (DIT), Ulster University (UU), and Dublin City University (DCU), National University of Ireland, Galway (NUIG) and University College Cork (UCC).

Keywords: Artificial Intelligence, Machine Learning, Cognitive Science, Ireland, Conference, AICS

1 Introduction

“Artificial intelligence gets real” was the title in Forbes magazine in 1998 [1]. A few years later, reports on artificial intelligence had become less enthusiastic and questions were asked like “Artificial Intelligence: Hype or Reality?” [2]. Nowadays, twenty years later, Artificial Intelligence (AI) is developing at a fast pace (again), and has received enormous attention from industry, academia and politics. Many companies go for ‘AI first’ when it comes to new products and research; international conferences about artificial intelligence and machine learning are sold out within minutes; and political powers such as the USA, China or Europe invest billions to secure, or achieve, a leadership role in artificial intelligence.

The *Irish Conference on Artificial Intelligence and Cognitive Science* (AICS) has experienced the ups and downs of Artificial Intelligence first hand. Thirty years ago, in 1988, the *1st Irish Conference on Artificial Intelligence and Cognitive Science* was organized by Henry McLoughlin, Arthur Cater, Gabriel McDermott, and Ronan Reilly at the University College Dublin, UCD. AICS quickly became Ireland’s premier forum

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for research in these fields, and has been held almost every year, at varying Irish universities. However, in the mid-90's as well as the early 2010's, AICS organisation stalled for a couple of years.

This year, the *26th Irish Conference on Artificial Intelligence and Cognitive Science*¹ is celebrating its 30th anniversary and is hosted by Trinity College Dublin's School of Computer Science and Statistics, the School of Psychology and Institute of Neuroscience. AICS will take place on the Trinity campus at the Trinity Long Room Hub, Trinity's interdisciplinary arts and humanities research institute from 6-7th December 2018. While once a niche area, the fields of Cognitive Science and Artificial Intelligence, which encompass Data Analytics, Information Retrieval, and Machine Learning, are now at the forefront of Irish computing research and industry.

AICS is as alive as the general field of artificial intelligence these days and received almost double the number of submissions as last year. The packed programme contains 29 presentations and 12 posters. The topics of the presentations and posters reflect the wide range of artificial intelligence and cognitive science research.

2 The Main Themes of AICS 2018

We are particularly delighted to have two international keynote speakers, namely Torsten Schaub (University of Potsdam, Germany) and Monica Bucciarelli (University of Turin, Italy). Torsten Schaub addresses artificial intelligence solutions to solving knowledge-intense combinatorial problems. Monica Bucciarelli presents new cognitive science discoveries about how adults and children reason algorithmically. A leading computer scientist and a leading cognitive scientist, reflecting the balance of the conference.

The primary themes that emerged from the successful submissions to this year's conference include AI and Cognitive Science research on numerical reasoning, reasoning applications, big data and machine learning, and speech processing, reflected in the conference thematic sessions.

Papers on the thematic session on numerical reasoning include AI developments in time-series classification discussed by Badiane et al., and Mahato et al.; as well as papers on algorithm selection by Collins et al., and on defeasible argumentation by Rizzo & Longo. Cognitive science advances in understanding mathematical skills and visuo-spatial mapping are considered by Morsanyi et al., and Cooney et al.

Papers on the theme of reasoning applications include AI applications to infectious disease epidemiology, traffic flow density, autonomous driving, and smart-home devices by Hunter et al., Saliba et al., Viswanath et al., and Furey & Blue. Cognitive science developments in understanding how people reason in the domain of moral judgments are presented by Parkinson & Byrne and by McHugh et al.

The Big Data theme focuses on AI developments in dealing with data in meetup networks, stock forecasting, bibliographic referencing, curriculum learning, and cloud servers, by Pakrashi et al., Shehin et al., Tkaczyk et al., Collier & Beel and Izima et al.

¹ <http://aics2018.scss.tcd.ie/>

Applications to cognitive functioning in multiple sclerosis patients are discussed by Kinski et al.

Further developments in understanding data are described in papers on traffic lights control, R2RML mappings, scholarly recommendations, and captioning by Carlo et al., Mathur et al., Beel et al., and Lindh et al.

The speech processing and reasoning session includes papers on AI advances in speech separation and speech quality monitoring by Ragano & Hines and by Jaiswal & Hines. Cognitive science advances in understanding narrative speech and joint speech are discussed by Broderick et al., and by Cummins. Sensor data and detecting adverts are considered in papers by Hossari et al., and Brophy et al. Cognitive processes in reasoning about scientific theories are discussed by Feeney & Travers.

3 AICS 2018 in Numbers

We received 55 submissions describing new research for AICS 2018, made up of 37 full papers and 18 student submissions. There was also a large number (14) of Nectar submissions giving an opportunity to spotlight the work of leading Irish-based researchers that has already been published in highly ranked international fora. The acceptance rate for full papers was 59% (22 accepted papers) and for student papers 67% (12 papers). The quality of submissions overall was very high, so that even submissions with relatively positive reviews had to be rejected. To accommodate as many presentations as possible, presentation slots were shortened this year from 20 to 15 minutes as it was not possible to secure additional space in the venue once the large number of submissions was known.

We are particularly delighted that a large number of Irish universities and companies as well as international institutions submitted their manuscripts to AICS. The list of Irish institutions includes:

- Bray Institute of Further Education (BIFE)
- Cork Institute of Technology (CIT)
- Dublin City University (DCU)
- Dublin Institute of Technology (DIT)
- Huawei Ireland
- Limerick Institute of Technology (LIT)
- Maynooth University (NUIM)
- National College of Ireland (NCI)
- National University of Ireland, Galway (NUIG)
- Queen's University Belfast
- Trinity College Dublin (TCD)
- Ulster University (UU)
- University College Cork (UCC)
- University College Dublin (UCD)
- University of Limerick (UL)
- Valeo Vision Systems Ltd

Most of the AI submissions come from departments of computer science, and most of the cognitive science submissions come from departments of psychology or computer science. About three quarters of the successful submissions are AI papers and about one-quarter are Cognitive Science papers.

The most full-paper submissions were made by the University College Dublin (22%), Trinity College Dublin (19%) and Dublin Institute of Technology (16%) (**Table 1**). The most student-paper submissions were made by the University College Dublin (22%), National University of Ireland, Galway (17%) and Trinity College Dublin (17%) (**Table 2**).

Table 1. Top-Institutions (Submitted Full Papers, n=37)

Institute	Submissions (Absolute) ²	Submissions (Relative) ²
University College Dublin (UCD)	8	22%
Trinity College Dublin (TCD)	7	19%
Dublin Institute of Technology (DIT)	6	16%
Ulster University (UU)	3	8%
Dublin City University (DCU)	2	5%
Others (15 Institutes)	15	41%

Table 2. Top-Institutions (Submitted Student Papers, n=18)

Institute	Submissions (Absolute) ²	Submissions (Relative) ²
University College Dublin (UCD)	4	22%
National University of Ireland, Galway (NUIG)	3	17%
Trinity College Dublin (TCD)	3	17%
University College Cork (UCC)	2	11%
Others (7 Institutes)	7	39%

4 Acknowledgements

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² A few submissions were made by authors from two institutions. In this case, we counted the submission twice. Hence, numbers do not add up to 100%.

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- [2] A.A. Hopgood, "Artificial Intelligence: Hype or Reality?," *Computer*, vol. 36, 2003, pp. 24–28.