

VistaMilk

MAKING AN IMPACT

Artificial Intelligence- Bridging the data gap in farming

By Derek Greene

In the past Artificial Intelligence (AI) was largely confined to the fields of Computer Science and Statistics. Increasingly these methods are being adopted in a range of industries and sectors, from financial services to medical diagnostics. However, for some applications, the lack of relevant data for building and evaluating AI models creates a barrier to adoption. In contrast, the availability of rich, large-scale datasets in the agricultural sector makes it a potentially rich area for employing AI. Individual farms produce substantial volumes of data on a daily basis, which will increase as low-cost sensors are adopted, leading to the constant collection of continuous "streams" of data. This



data is heterogeneous, ranging from measurements of soil conditions to infrared spectral analyses of milk. Given this rich data, the challenges for researchers are twofold.

Firstly, how can we integrate these diverse datasets at a national level in a practical way? Secondly, what are the appropriate AI techniques to use for modelling the integrated data, in order to help farmers and processors make the right decisions? A variety of projects in VistaMilk are already being undertaken to answer those questions. These range from developing new algorithms to predict grass growth to support sustainable dairy farming, to building deep learning architectures which automatically classify agricultural landuse based on satellite or drone imagery. Working with VistaMilk industry partners, researchers aim to not only develop novel algorithms, but also provide decision support technologies which will have a real impact in Irish farms.

For more information contact; Derek Green derek.greene@ucd.ie

New staff



Left: Cathal Ryan- Insight Centre for Data Analytics, PhD
Middle: Bhaskar Dhariyal- Insight Centre for Data Analytics, PhD
Right: Dixon Vimalajeewa- TSSG, Postdoc

MEET THE RESEARCHER



Name: Mark Roantree
Host: Dublin City University
Education:

- Trinity College, Dublin (BSc)
- Dublin City University (MSc)
- Napier University, Edinburgh (PhD)

Hobbies:

Sport (Gaelic games & rugby), music (from Led Zeppelin to Fontaines DC, via Joy Division and Smiths), watching TV like The Wire and movies like Raging Bull.

Role in VistaMilk:

Our research involves all aspects of data engineering from Data Acquisition, through Integration and OLAP (Online Analytical Processing) through to Machine Learning. In VistaMilk, we are constructing multivariate datasets from distributed, heterogeneous sources such as Teagasc & ICBF, Met Eireann, and a wide number of web sources. This requires a suitably designed canonical data model together with a smart integration strategy. We are investigating the "on-demand" approach to warehousing, where data is only acquired, transformed and integrated if and when it is needed for machine learning algorithms. Contact:

mark.roantree@dcu.ie

PUBLICATIONS

[Observed progeny performance validates the benefit of mating genetically elite beef sires to dairy females](#)

DP Berry, SC Ring - Journal of Dairy Science, 2020

[Choice of artificial insemination beef bulls used to mate with female dairy cattle](#)

DP Berry, S. C. Ring, A. J. Twomey, and R. D. Evans Journal of Dairy Science, 2020

FUNDING

- [ICT AGRI-FOOD ERA-NET](#). 2019 call on Data-driven ICT platforms and solutions to improve the sustainability of agri-food Systems, and Barriers for adoption of ICT technologies in the agri- food systems now open. Details available [here](#). Deadline for pre-proposal submission is March 3rd 2020.
- [FOSC ERA-NET](#) on climate resilient food systems, including innovative technology deployment for better efficiency of inputs and outputs of food systems. Call open now. Pre-proposal deadline 19th February 2020. Details available [here](#).
- [CHIST-ERA ERA-NET](#) 2019 call now open. 2 topics addressed: [Explainable Machine Learning-based Artificial Intelligence and Novel Computational Approaches for Environmental Sustainability](#). Short proposal deadline 14th February 2020.
- [HDHL ERA-NET](#) on the [development of targeted nutrition for prevention of undernutrition for older adults](#). Call open now. Full application deadline 7th April 2020.
- [Aquatic Pollutants ERA-NET](#) on measuring, evaluating and acting on environmental behaviour of contaminants of emerging concern (CECs), pathogens and antimicrobial resistant bacteria in aquatic ecosystems. Call to open on February 17th 2020, pre-proposals deadline April 16th 2020.
- [ICRAD ERA-NET](#) on infectious animal diseases, including in-field detection technologies. Call to open soon, submission deadline will be 2 months later. Details available [here](#).
- [2020 US-Ireland Research and Development Partnership Call](#) in agriculture. Call open now. Irish submission deadlines on February 13th 2020. Details available [here](#).
- IRC [Employment-Based Postgraduate Programme](#) grant for industry partners to host PhD students (€24,000 pa) with the support of a higher education institution. Call open now. Deadline 27th February 2020.
- [EuroStars-Eureka](#) for SME international R&D cooperation. Next cut-off on February 13th 2020.

EDUCATION AND PUBLIC ENGAGEMENT



SAVE THE DATE!

- **Blockchain Masterclass- 6th April, NUIG**
- Internal Conference, (All VistaMilk staff and students)- **5th and 6th May- location to be confirmed**
- External Conference, (VistaMilk staff, students and industry partners)- **8th September- location to be confirmed**
- [Global IoT Conference- 3rd-5th June](#)

OTHER NEWS!

- Teagasc Site Manager **Elizabeth Walsh** got engaged to her fiancé Sean recently in Inchydoney.
- VistaMilk hosted the SFI Quarterly Directors meeting in Teagasc at the end of the month.
- Multimedia interns Brianan and Greg have joined the operations team for the next 6 months and will be working on a range of multimedia items.