




Northern  
Ireland

# Northern Ireland - A location of choice for AI and Data Analytics

Northern Ireland offers an innovative cluster of expertise in AI and Data Analytics across a wide range of sectors. The region is already globally renowned as a location offering a high quality and skilled workforce for cost effective software analysis, design and development.

The region's global success can be attributed to a blend of world class talent, tech research excellence and highly competitive costs including attractive R&D incentives. Northern Ireland's AI start-up and SME tech community is thriving due to harnessing talent through incubation, a highly developed entrepreneurial ecosystem, and a vibrant networking scene.

## Did you know?

- Northern Ireland has several major clusters of excellence in AI research including cyber security, hardware, IoT, medicine, robotics, multi-media, analytics and economics.

- Academic AI capability in Northern Ireland is concentrated in its two main university institutions: Ulster University (UU), which has campuses in Belfast, Jordanstown, Derry~Londonderry and Coleraine; and Queen's University Belfast (QUB).
- The Centre for Secure Information Technology (CSIT) at QUB is the UK's National Innovation and Knowledge Centre (IKC) for cyber security, and the UK's largest cyber security focused university technology research, development and innovation centre.
- Ulster University has a long and proud history of expertise in Data Analytics both in terms of machine learning algorithms and the application of analytical techniques across a diverse range of domains.
- BT Ireland Innovation Centre (BTIIC) represents a major partnership between BT and Ulster University and is at the intersection of Artificial intelligence, the Internet of Things and Telecommunications.
- There are over 150 permanent staff involved in AI research across the two universities.
- There are over 100 companies in Northern Ireland currently working in the sector, including many spinouts from the universities.

### EXCEPTIONAL TALENT



#### 85%

of NI Students achieved the top three grades in A-Level exams (76% in UK).

#### 4000

Over 4,000 graduates in business and technology including over 1,100 postgraduates.

### COST EFFECTIVE



#### 30%

Operating costs up to 30% lower than in the rest of the UK and Europe.

#### 38%

reduction in typical salaries compared to London. 26% reduction compared to Dublin.

#### R&D

The effective cost of every £1 spent on R&D can be as little as 43p.

### PARTNERSHIP



Bespoke government support packages combine practical advice and financial assistance:

- Support for skills development and R&D
- Location selection intelligence
- Property search & selection
- People planning
- Business modelling & investment support
- Start-up incentives & infrastructure.

# Entrepreneurial AI Hub

## Adoreboard

Adoreboard uses emotional AI to unify human experiences for better business outcomes.

The company was asked by Easyjet, Europe's leading airline, operating on over 600 routes across more than 30 countries, to see if it could optimise customer engagement; creating more personalised and emotional experiences; and enhance the customer experience by understanding the importance of optimising all aspects of its communication.

Adoreboard used regression analysis on data to understand the relationship between emotion in content and behaviour, such as click-through rate.

Based on their analysis, Adoreboard was able to optimise email content in order to produce a 13% increased click-through rate.

## BrainWaveBank

BrainWaveBank makes it possible to measure and track brain activity and cognitive performance for anyone, anytime, anywhere. This easy-to-scale and distributable approach will help clinical professionals to transform understanding of brain health and develop the next generation of treatments.

It securely gathers, stores and analyses data from many thousands of users, building neurocognitive profiles of individuals and populations or demographic groups.

Using AI Group level data it can support clinical trials and the development of new therapies and diagnostics while individual level data can provide users with personalised insights into their cognitive health.

## Kainos

Kainos is a leading software development organisation and has been working with the UK's Driver and Vehicle Standards Agency (DVSA) which works to make Britain's roads safer and conducts over 42 million car tests each year.

Kainos worked with DVSA to pioneer a predictive analytics tool which has revolutionised the process for identifying fraud and inadequate standards. This machine learning (ML) tool enables DVSA to identify abnormal MOT testing behavioural patterns, effectively target enforcement and inspection activities, and ultimately improve Britain's road safety.

## Yedup

Yedup is a leading artificial intelligence research and exploitation hub.

It uses Low Latency AI Systems for Algorithmic Trading, Quantitative Hedge Funds and Market Makers.

It monitors global information flows continually in real time using its own technology. Using AI, it extracts current investor, consumer views and opinions about financial instruments, companies, industries and markets.

It produces streaming signals that may be used to identify advantageous trading opportunities.

By getting price-sensitive information to the market faster and more accurately than other channels, it ensures its clients will be first to know about impending market movements.

## Ampliphae

Ampliphae is an intelligent cloud-management solution built on artificial intelligence and machine learning.

Cloud delivery is complex which makes it highly difficult for administrators to really understand what tools and services are being used within an organisation. Everything is encrypted and tools and services are often on hyperscalers.

Ampliphae uses signal data to find clusters and also content analysis to look at the data being moved into apps to see if it appropriate for that app and business function.

The solution can also automatically identify data types and tag them. The additional benefit is that the business can identify cyber risks on a number of threat vectors by understanding the data being accessed, who/what is moving it and where it is going.

## Auromind

Auromind has developed an eXplainable Artificial Intelligence (XAI) software solution for businesses willing to assess the quality of their AI models and to explain the mechanisms of the decision-making process. This delivers three key benefits: safety, ethics, and trust:

- Safety - to identify unethical design, engineering omissions, signs of hacking and deliberate interference with AI models, and various external factors which can affect AI models performance;
- Ethics - to align AI model design and development with ethical values and principals;
- Trust - to provide full transparency for the decision-making process, where AI models no longer are treated as a black box.

## Analytics Engines

Analytics Engines worked with Belfast City Council who had estimated that it had sizeable lost revenue from uncollected non-domestic rates.

The solution developed uses multiple data points and advanced analytics to identify businesses not paying rates or the correct amount of rates. It combined internal data sources with external building rates data and environmental health data to create a comprehensive view of each property usage.

The solution identified £500k annually in additional revenue from unpaid non-domestic rates, not including backdated rates. It has also been proven to increase the efficiency of the inspector's teams by up to 250% through improved targeting of building visits.

## Diaceutics

Diaceutics, is helping patients to receive potentially lifesaving medicine through better diagnostic testing, is collaborating with computer hardware manufacturer Lenovo, and chip manufacturer Intel.

Using artificial intelligence to see whether patients can be grouped according to diagnostic test information, the company is hopeful that this data can help identify ways to improve diagnosis, treatment and outcomes for patients with similar characteristics.

After a number of biomarkers covering a variety of tumours and cancer types have been inputted, the machine learning system will be able to identify similarities and patterns within the testing data and to highlight what is happening among groups of patients.

## LIOPA

Belfast AI spin out LIOPA has announced that it is to deliver a prototype patient/carer communications aid for tracheostomy patients in critical care environments.

Working along with Lancashire Teaching Hospitals, NHS Foundation Trust and Queen's University Belfast, Liopa will develop SRAVI (Speech Recognition App for the Voice Impaired). This project will focus on a select group of tracheostomy patients (approximately 10,000 tracheostomies are performed annually in the UK). These patients struggle to vocalise but are able to move their lips normally.

The technology allows the translation of lip movement to text using a mobile app on a mobile device. It requires very little training and is inexpensive.

Invest Northern Ireland, the region's economic development agency, works in partnership with investors to offer advice and financial assistance to support business establishment, growth, capability development and international competitiveness.

For more information visit: [InvestNI.com](https://www.investni.com)

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