

Accelerating scientific invention and discovery with AI

Northstar worked with the STFC Hartree Centre with help from the LCR4 START programme to explore the potential of AI to act as a virtual research assistant to search through open literature quickly and cost-effectively, accelerating the process of research scientists generating new ideas and patents.

Challenge

From published academic research papers to patents filed in international patent databases, there are large amounts of publicly available data from open literature sources that are not currently being used. Northstar, a new company based in the Liverpool City Region, wanted to find a way to capture relevant data to repurpose scientific inventions, generate new ideas and patents more quickly and cost-effectively without relying on human researchers and information scientists. They wanted to understand how they could use AI to create a digital platform capable of acting as a virtual research scientist.

Approach

Funded by ERDF as part of the LCR4 START programme, Northstar worked with data scientists and AI experts at the Science and Technology Facilities Council (STFC) Hartree Centre to create a workflow capable of bridging a gap between the science and the application. The team had expertise in various aspects of data science, from data engineering and data standardisation to data exploitation, using their skills to deliver a proof-of-concept AI demonstrator.

Benefits

This tool is capable of searching the open literature in a fraction of the time and cost of a manual approach. Using AI to dive through the breadth and depth of scientific literature rather than humans selectively searching a narrow field of patents and papers offers greater breadth and depth to scientific discovery. This has the potential to significantly accelerate the pathway to scientific discovery for companies who are routinely looking for new inventions by removing the limitations of what traditional desk-based research can highlight.

Beyond LCR4 START, Northstar plans to continue this project. Now the company has a live demonstrator, it is working on creating a user interface and web portal for the tool that embeds machine learning to self-learn from both questions and answers, outputting results in accessible and graphical formats for researchers.

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All great innovations are built on what has happened previously. We wanted to find a way to capture the relevant open data that would enable us to repurpose scientific inventions quicker and generate new ideas. ”

Steve Kelly
Northstar



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This work can speed up the process of creating new patents and methodologies that can make the world a better place. Our ultimate goal is to bring the dark scientific data into the light and demonstrate the first AI at scale to achieve this.

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Steve Kelly
Northstar

At a glance

- New AI tools and techniques explored and evaluated
- Developed a data science workplan
- Accelerating scientific discovery and invention processes
- Removing limitations of traditional desk-based research by adding depth and breadth to the search field
- Proof of concept demonstrator developed to pave the way for further work and funding

Who we are

- 70+ computational scientists and technologists
- World-leading supercomputing and AI infrastructure
- Bespoke small teams built around your project
- Tailored business development support
- Access to our network of industry, academic and technology partners

What we do

- Boost productivity and enhance innovation for industry
- Big data analytics and artificial intelligence (AI)
- High performance computing and quantum simulation
- Training and skills development
- Insights into future technologies



Credit: STFC Hartree Centre

Our impact on UK industry and society

The Hartree Centre was created by UK Government to help businesses and public sector organisations accelerate the adoption of high performance computing (HPC), big data analytics and artificial intelligence (AI) technologies. We play a key role in realising UK Government's Industrial Strategy by stimulating applied digital research and innovation, creating value for the organisations we work with and generating economic and societal impact for the UK.

The Science and Technology Facilities Council (STFC) Hartree Centre is part of UK Research and Innovation.