Science and Technology Facilities Council

Hartree Centre

Streamlining Environmental Impact Assessments in construction with AI

Independent advisory firm Turley worked with STFC Hartree® Centre to simplify information extraction for Environmental Impact Assessments using AI. This initiative was supported by funding from the Innovate UK BridgeAI programme.

Challenge

Before large construction projects can move forward, their environmental impact must be carefully considered. Under Environmental Impact Assessment regulations, a project's cumulative effects such as noise, biodiversity and air quality, must be evaluated alongside those of nearby developments. This process is often labour-intensive, requiring the identification of relevant projects, collection of multiple technical reports, and analysis of their findings to assess the combined environmental impact. Simplifying and accelerating this process would allow Turley to focus more on applying their expertise and advising clients. To achieve this, Turley sought to automate data extraction and summarisation, streamlining the preparation of cumulative effects assessments.

Approach

To alleviate the need for Turley to manually retrieve vast amounts of information from multiple documents, our AI scientists developed a prototype chatbot interface to help extract data from text in PDF documents. This was made possible with support from a £15,000 Innovate UK BridgeAI Innovation Voucher, which enabled Turley to access the expertise of our data scientists. By combining various machine learning technologies and coding techniques, our researchers implemented data processing, storage and retrieval, and integrated large language models to build the chatbot interface. This combination of technologies was crucial for the successful development of this proof-of-concept, as individual technologies alone cannot effectively access data from PDF documents.

> **"AI isn't a magic wand. While powerful, it requires careful development to achieve meaningful results, as we've come to understand through our collaboration with the Hartree Centre."**

Carol Maughan
Director, Company Communication and Digital Innovation MBCS at Turley

Credit: Pexels

Benefits

Our data scientists developed a prototype chatbot interface designed to enable Turley to quickly extract relevant information from lengthy PDF documents, allowing them to focus on preparing cumulative effects assessments and providing strategic advice to clients. Beyond developing the proof-of-concept, our collaboration has strengthened Turley's understanding of AI, benefitting both individual growth and organisational development. Looking ahead, options for Turley include upgrading the prototype to process images and tables, further boosting productivity, enhancing consultancy services, and supporting compliance with environmental regulations in construction.

At a glance

- Developed a prototype chatbot interface that extracts data from texts in PDF documents using various machine learning and coding techniques
- Streamlined the process of preparing cumulative effects assessments
- Enabled Turley to dedicate more time for generating insights and advising clients more effectively
- Enhanced Turley's understanding of machine learning technologies, driving both individual and organisational development

Who we are

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, artificial intelligence (AI) and quantum 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. We are proud to be part of UK Research and Innovation.

What we do

- Boost productivity and innovation for industry
- Offer training and skills development
- Provide insights into future technologies
- Give tailored business development support
- Build bespoke small teams around your project