

# Finding cheaper and more sustainable ceramic glazes using data science

Through the Innovate UK BridgeAI programme, Box O Fun worked with the STFC Hartree Centre to develop a tool that will help ceramicists easily find alternative glazes that reduce costs and waste while maintaining the desired glaze properties.

## Challenge

Can you imagine a world without glazes for your ceramic ornaments and household items, or for your pottery classes? In ceramics, glazes are crucial as they affect not only the aesthetics but also the physical properties of ceramics articles, such as the ability to hold liquids. This means that choosing the appropriate glaze is an important part of ceramics work.

Although a myriad of glaze recipes can be found through open-sourced data online, users are unable to filter their search based on glaze ingredients. It is therefore challenging for ceramicists to find glaze recipes that match their budget and the availability of ingredients while providing the right glaze properties.

## Approach

Ceramics manufacturer Box O Fun produces ceramic articles and tools. The company wanted to help ceramicists explore glaze options that fulfil cost, functionality and aesthetic requirements. Using an Innovate UK BridgeAI £15,000 Innovation Voucher, the company was able to access the Hartree Centre's data science expertise. This allowed for data retrieval using automated methods, enabling the collation of data from approximately 25,000 glazes. Using the collated data, our team built the search function based on the properties and material compositions of these glazes. In this newly developed feature, users can input available materials and their quantities to find economical glaze recipes that deliver the desired properties.

“This project has helped us to explore the possibility of machine learning with materials. It led us to question what more could be done to transform the foundation industries through the use of technology, particularly when working towards net zero targets.”

**Layla Hashim**  
Box O Fun

Credit: Box O Fun

## Benefits

Using automation, our data science team was able to speed up and expand the scope for glaze data collation, such as material composition and carbon output for as many as 25,000 glazes. With the search function built upon the vast amounts of data collected, ceramicists at Box O Fun can now find appropriate glazes that they can create using available materials matching their budget. By helping ceramicists choose cost-effective ingredients including leftover materials, Box O Fun will benefit both in terms of cost and waste reduction, with the latter also driving environmental sustainability for the company.

## At a glance

- Automation enabled data collection on approximately 25,000 glazes
- Developed a glaze search function filtered based on materials and their quantities
- Enhanced the company's understanding of digital technologies
- Delivered cost savings and waste reduction for the company, enhancing efficiency and environmental sustainability
- Valued working with the STFC Hartree Centre as a trusted innovation partner

## 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

