Improving river traffic control using data science and machine learning

NASH Maritime is working with the STFC Hartree® Centre to develop methods that accurately track the speeds of watercraft to enhance river safety through the Innovate UK BridgeAI programme.

Challenge

With various shipping vessels and other watercraft sharing the same waterways, the risk of collisions can lead to devastating consequences. Therefore, closely monitoring watercraft is crucial for enhancing river traffic management and ensuring the safety of everyone navigating the river.

NASH Maritime (part of APEM Group), a consultancy specialising in shipping, navigation, and maritime risk, uses CCTV to monitor vessels and distinguish between various types, from canoes to cruise liners. However, enhancing river safety requires more accurate speed measurements of vessels on the river so that activities such as speeding above the safety limits can be identified.

Approach

NASH Maritime was able to access the Hartree Centre's expertise in data science and machine learning through an Innovate UK BridgeAI Innovation Voucher that provided £15,000 worth of technical support. Our scientists applied clustering algorithms and other advanced techniques to Light Detection and Ranging (LiDAR) data to map cars on roads. LiDAR uses pulsed light that reflects off surrounding objects to achieve precise 3D positioning of the objects. This LiDAR data on cars was analysed alongside CCTV footage to find the 3D locations of the cars in CCTV images. This method developed for cars can be adapted to detect and monitor waterborne vessels using LiDAR and CCTV data at NASH Maritime, enabling the accurate recording of their speeds on the river.

> "It has been a pleasure to collaborate with the Hartree Centre to deepen our AI knowledge and to accelerate our product and service development."

Chris Hutchings
NASH Maritime

Credit: Pexels

Benefits

The proof of concept developed by the Hartree Centre has provided the basis for method development specific to NASH Maritime's CCTV data. This advancement has expedited NASH Maritime's readiness to accurately determine vessel speeds, which will significantly improve river traffic control. With enhanced river traffic control, NASH Maritime can boost safety on the river by minimising the risks of accidents, preventing the loss of life and other damages that result from unfortunate collisions.

At a glance

- Developed a proof of concept using LiDAR data to map cars and their speeds, adaptable for monitoring vessels on rivers

- Progressed NASH Maritime's readiness in obtaining vessel speeds through CCTV data, which will enhance river traffic control

- Enhanced NASH Maritime's understanding of digital technologies and how they can enhance maritime safety on rivers

- 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