

Improving the accessibility of public transport with AI

STFC Hartree® Centre and InSignLanguage through the support of the Innovate UK BridgeAI programme are setting a new standard for AI-driven accessibility for public transport, by developing a British Sign Language-to-English translator.

Challenge

Public transport services can be difficult to use or even inaccessible to British Sign Language (BSL) users, such as people who are Deaf or Hard of Hearing. Being unable to efficiently communicate with non-BSL users, or access audio updates containing essential travel information can cause misunderstandings and frustrations, making public transport inaccessible and challenging to use. To address this, technology exists that allows the translation of English into BSL, for example, through the use of an AI avatar. This technology allows one-way communication between a hearing person and a Deaf person, but doesn't enable the Deaf person to respond through sign language. BSL translation has historically been underfunded and remains an open research question, and the additional element of visual input makes this a computationally expensive task to address.

Approach

We worked with InSignLanguage through an Innovate UK BridgeAI Innovation Voucher that provided £15,000 worth of technical support to provide insight into how to develop this technology. Through the research and expertise of our AI team, we evaluated and outlined the requirements of such a technology, giving InSignLanguage an understanding into what the requirements of this undertaking would be. To demonstrate how this technology could work, we then created a proof-of-concept. An AI model was trained using a simple labelled hand gesture data training set, and was able to classify the gestures successfully. This demonstrates the capability for further advancement of this technology, as we were able to successfully interpret basic signs from this early development stage.

At InSignLanguage, we provide accessibility that changes lives. Our collaboration with the Hartree Centre through the Innovate UK BridgeAI programme marks an important step toward breaking down communication barriers for the Deaf community.

John Hood

InSignLanguage

Credit: Adobe Stock

Benefits

By developing proof-of-concepts for cutting-edge AI-powered translation tools, we could potentially transform accessibility for the UK's public transport system. This breakthrough in BSL-to-English translation could bridge critical communication gaps, fostering a more inclusive society. Through this research, we are pushing the boundaries of AI's role in accessibility, demonstrating its potential to solve real-world challenges. InSignLanguage is committed to advancing this innovation into a commercialised tool that can seamlessly integrate across transport networks and potentially other industries, empowering Deaf individuals to navigate public spaces more easily.

At a glance

- Successful proof-of-concept created for sign language-to-English translation
- Potential for increased accessibility for Deaf individuals across further applications
- Demonstration of the potential of AI-driven accessibility technology
- Developing research into the use of AI for communication for the Deaf community

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

