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# Smooth sailing

**Date:** 2018**Sector:** Internet Of Things &  
Automation

AI

Automation And Optimisation

Data Analytics

Telematics



AI learns from captains' good sailing practices to ensure every voyage is as efficient as possible

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**Partners:** Major shipping company

## Can software save fuel?

For shipping companies, fuel is the next biggest expense after employees – and a major contributor to environmental impacts. So when Hitachi engaged a major shipping line with an idea for an artificial intelligence (AI)-based solution to reduce fuel use, the company was interested in partnering to develop it together. This passenger and freight business was already aiming to become a leader in the use of cognitive technologies, using internet of things (IOT) to connect its vessels and take advantage of data-driven analytics. The company also has a sustainability target to reduce fuel consumption annually. For the last 10 years, it has worked with energy-saving programmes and used onboard fuel management systems to successfully reduce fuel usage. However Hitachi's solution could make it possible for the company to use its fuel data in a smarter way, as well as leveraging the experience of skippers who have decades of experience working with fuel optimisation.

## Learning best practice

The co-creation proposal from Hitachi aimed to analyse data from the company's vessels to look for patterns and factors that lead to either high or low fuel consumption. The shipping company supplied five years of data from six of its vessels for the project. Using AI, classical machine learning and neural networks, we found that even when loading and weather conditions were the same on a specific route, fuel use could still vary. The source of this variation was the captain, who, being human, cannot apply precisely the same settings across a complex trip. So we trained the AI to learn 'best practice' trip behaviour so it could be replicated when the same conditions applied. In practice, this means that once weather, loading and route data are fed into the model, it will suggest the most efficient speed and trim profiles for each segment of the route. It

can also suggest the optimal amount of water ballast at the start of a trip, reducing the vessel's overall weight.

## Optimising consumption

Now that these tests have proven its value, we are installing the analytic engine on a specific vessel, and connecting it directly to the main engines' control system. This pilot study will be supervised by an experienced skipper who described how AI will complement human skills on board: "Planning a trip and handling a vessel in a safe and, at the same time, fuel efficient way is craftsmanship. Practice makes perfect, but when assisted by AI a new captain or officer could learn how to fuel optimise quicker. In return, this contributes to a more sustainable journey."

This pilot is the first of several studies that was evaluated at the end of 2018 to help the company decide how to continue with AI assistance on its ships. The company aims to have its entire fleet AI-assisted by 2021.

## An opportunity for the entire shipping industry

The benefits of this Hitachi collaboration needn't just be limited to one company. It's an open solution that's replicable. So in the near future, there's a chance that ships worldwide could be saving fuel by using best practice from their captains on every voyage.

## Labs Involved

Automotive and Industry Lab

[Contact Lab](#)

## The Team



Anthony Ohazulike, PhD  
Leader of Automotive Team and  
Senior researcher



I work with Hitachi customers on variety of automotive, industry and energy related use cases – from remaining useful life of mechanical parts to forecast of energy demand.

### Co-creation

Our co-creation approach develops breakthrough innovations with our partners.

[Find out more](#)

### People & Labs

Our labs are present across Europe, located in key areas related to our work.

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## Get in touch

Contact us for more information on how we can work together.

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