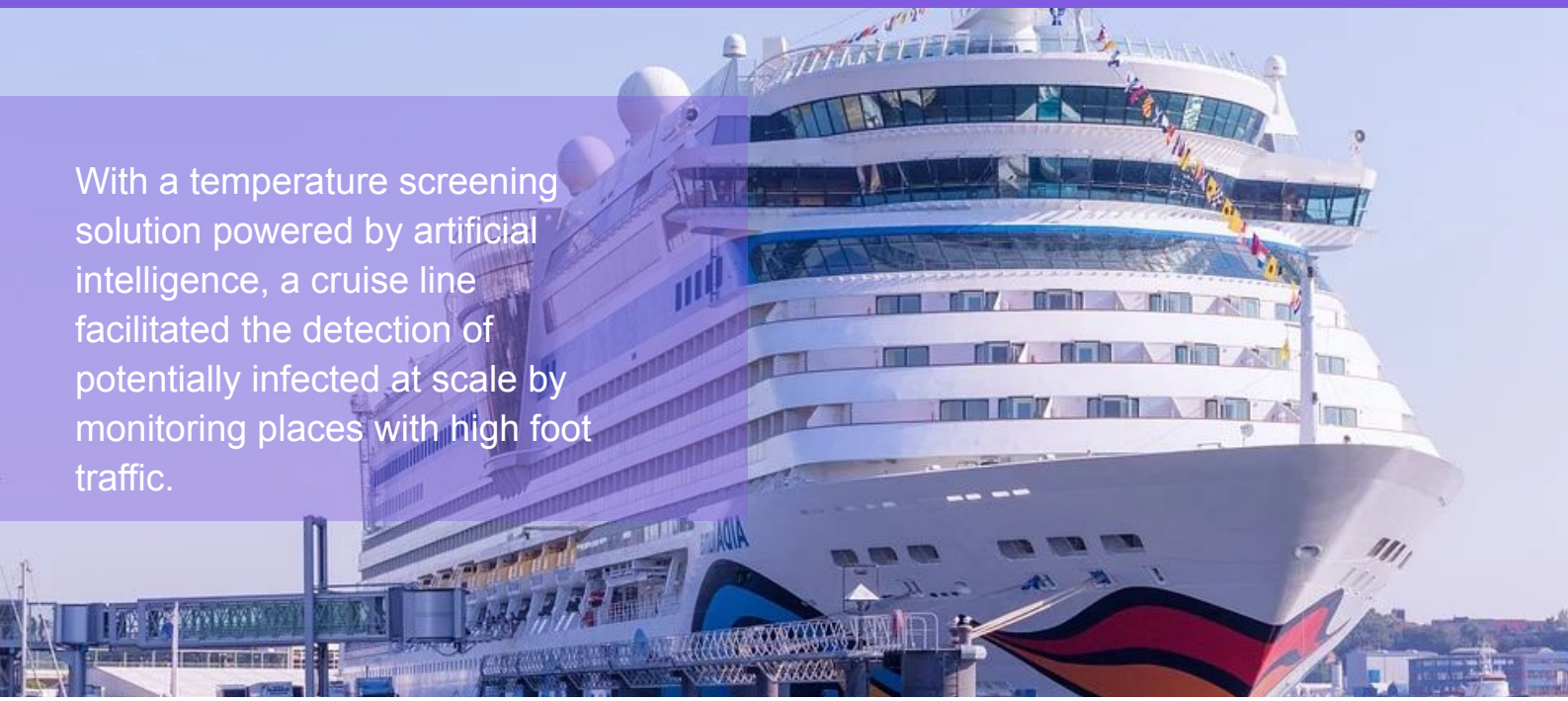
Tourism | Machine Learning

A Cruise Line Resumes Operation During COVID-19 with AI-Driven Fever Screening



With a temperature screening solution powered by artificial intelligence, a cruise line facilitated the detection of potentially infected at scale by monitoring places with high foot traffic.

Brief results of the collaboration:

- By installing an AI-driven temperature screening system at locations with high foot traffic, the customer safeguarded passengers and the crew, resuming operations in a matter of weeks.
- The company facilitated the mass screening of up to 1,080 people per hour to timely detect potentially infected individuals, tracing their route and close contacts.
- Through enforcing safety measures on board the ship, the cruise line addressed the loss of $16+ million daily.
- Now, it is possible to fully comply with safety recommendations from the World Health Organization, such as ensuring social distancing and wearing masks in public places.

The customer

The customer is among top 5 largest cruise lines in the world. The company's fleet has 20+ ships, sailing to 300+ destinations globally. Annually, the cruise line serves almost 5 million customers.

The need

In 2018, the cruise industry served 26 million passengers, generating around $45.6 billion. Due to the coronavirus pandemic, cruise lines were forced to stop operations. According to the World Travel and Tourism Council, the global GDP losses of the industry will amount to more than $2.6 trillion. To resume operations and ensure safety of passengers and the crew, it is crucial to prevent the disease from spreading on board the ship.

In this regard, the customer approached Altoros to enable early detection of the potentially infected by automating mass fever screening.

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The challenges

As fever is a common symptom of the coronavirus disease, temperature screening is now obligatory in places of mass gatherings. When done manually, it may significantly prolong the boarding time and expose people in the queue to the risk of infection.

Accuracy of temperature measurements is another issue. While regular thermal cameras are capable of mass screening, they do not account for external sources of temperature, such as hot beverages carried by passengers. Furthermore, such cameras may fail to recognize a human face covered with a mask, glasses, or headwear, making temperature measurements impossible or inaccurate.

Technology stack	
Platform	Amazon Web Services
Programming language	Java
Frameworks and tools	Spring Boot, Spring MVC, Hibernate, NGINX, Angular, Chart.js, OpenCV, WebSocket, Swagger, Maven 3, FFmpeg, Twilio
Data stores	Amazon S3, Amazon RDS

The solution

To ensure proper allocation of safety measures, the team at Altoros communicated with the customer to analyze cruise ship premises and identify places with high foot traffic. This way, the company organized technology-driven checkpoints at an entrance, decks, common leisure areas, shops, restaurants, etc.

For the purpose, Altoros delivered a turn-key temperature screening solution to install at the checkpoints. Powered by artificial intelligence (AI), the system comprises interconnected thermal cameras coupled with a cloud storage, a web dashboard, and a mobile app.

Ensuring mass screening, each AI-driven thermal camera can measure temperature of 30 individuals simultaneously at a 3-meter distance. To screen people whose faces are covered with masks or any accessories, developers at Altoros created and trained face recognition models achieving 95% accuracy. The system also detects external sources of temperature and excludes their readings from screening results. With integrated cameras, it is then possible to reproduce the route of a potentially infected, tracing close contacts.

Our team built a web dashboard to provide detailed reports on screening and a mobile app to notify about the detected cases. For instance, the system notifies if a person is not wearing a mask in public or if social distancing is violated.

1,080 individuals screened hourly

95% face recognition accuracy

30 people screened per second

The outcome

With an AI-powered temperature screening solution by Altoros, the cruise line ensured safety on board the ship and resumed operations in a matter of weeks. This helped to address the losses of $16+ million daily. The customer prevented the disease spread among passengers and the crew by mass screening 1,080 individuals per hour at locations with high foot traffic. With interconnected cameras, it is also possible to reconstruct the route of a potentially infected, thus tracing their close contacts. Relying on screening reports and alerts, it becomes easier to track violation of the recommendations by the World Health Organization and take immediate action.

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