POWERING HEALTH INNOVATION WITH AI

Global hackathon teams use AI to accelerate cancer breakthroughs, combat childhood obesity, prevent falls and more

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POWERING HEALTH INNOVATION WITH AI

There is no doubt: AI has the potential to transform health care. The most recent SAS Hackathon showcased how the transformative power of analytics can spark health care innovation.

The Hackathon was made possible with support and participation from partners Microsoft, Intel and Accenture and was entirely conducted on a Microsoft Azure cloud infrastructure to facilitate the agile analysis and visualization of big data.

One hundred teams from 31 countries around the world brought their data and challenges to the competition, hoping to have their ideas recognized – and potentially commercialized for public use.

In this e-book, we're covering just a few of the top hackathon projects, including:

- **Accelerating cancer breakthroughs** by using AI to provide vital clinical data for researchers while protecting patient privacy.
- **Monitoring patient stability and detecting disease** by incorporating biometrics to create an early warning system for falling risks or disease progression.
- **Combating childhood obesity** by creating a "digital city" to simulate an active lifestyle and guide families to make healthy choices.

Keep reading to find out how the power of AI could substantially improve patient outcomes and change the way we all experience health care.

Read more:
Accelerating cancer breakthroughs

Accelerating cancer breakthroughs with AI and synthetic data

CHALLENGE

10 million people die from cancer every year. To improve cancer prevention and treatment, researchers must have access to real-world patient data that can be freely analyzed and shared, while also protecting patient privacy.

Read more

SOLUTION

The hackathon team from SAS Partner Amesto NextBridge developed a system to take clinical data, add noise to it to keep individual patients from being identified and optimize it to create high-quality synthetic data for cancer researchers. The result? More (and better) data that researchers can analyze and share to speed up the search for a cure.

Project details

"If you start spreading data for research purposes, you risk revealing personal information about individuals, that you're not allowed to do, that could harm people. This is what we want to stop."

Kjetil Kalager
Vice President, AI Lab, Amesto NextBridge

Next story:
Monitoring patient stability, predicting disease

Analyzing patient motion to predict disease progression or quantify injury recovery

CHALLENGE

Health providers can learn a lot from watching patient movements, which has historically required an in-person visit. But using remote monitoring devices and AI algorithms, providers could get early warning signs from patient stability that could prevent falls or anticipate disease progression. Every year, 36 million older adults fall; 32,000 die from the fall, and 3 million are rushed to the emergency room for a fall-related injury. About 1 in 5 of these falls results in a severe injury, like a broken bone or a brain injury.

Read more

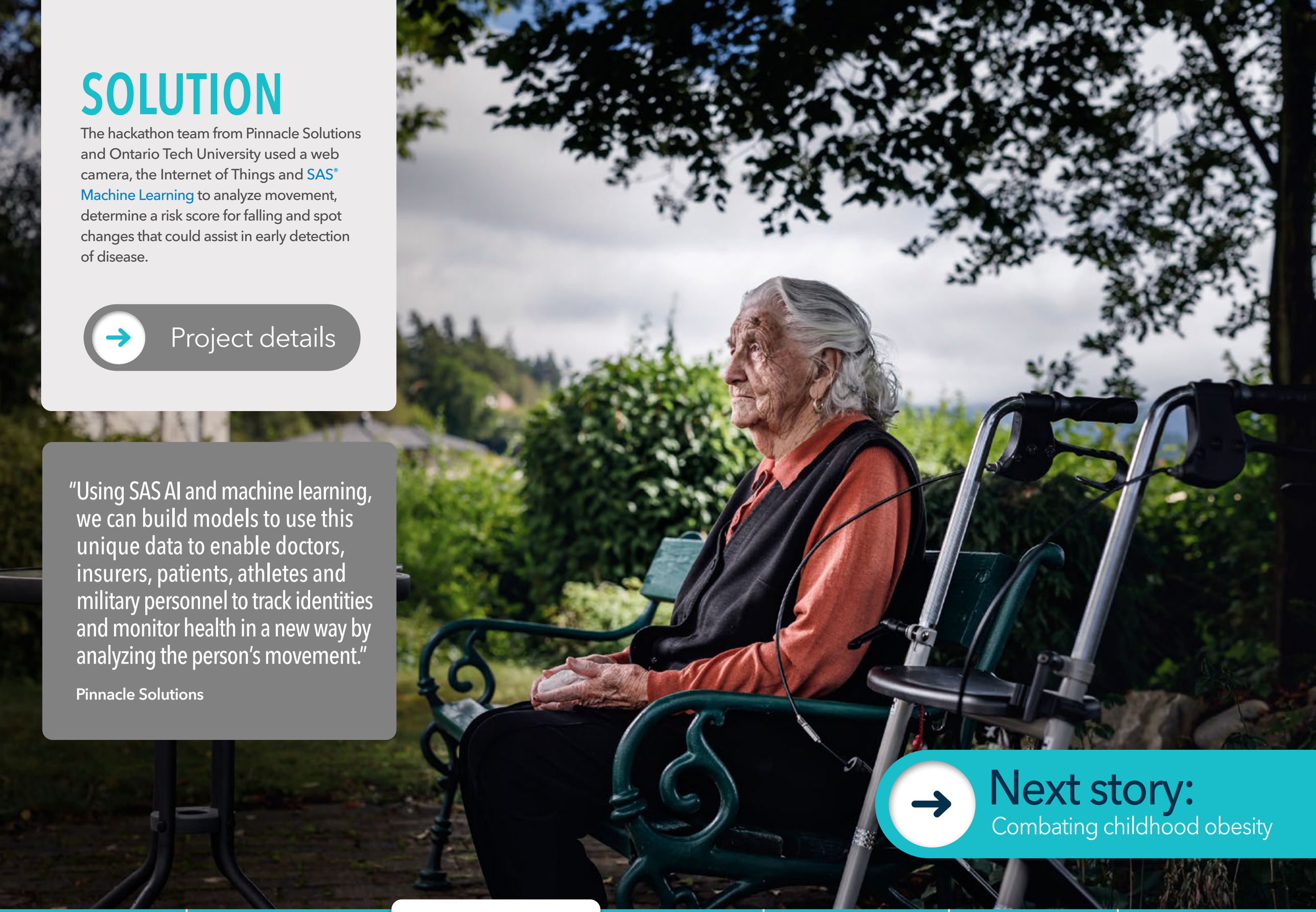
SOLUTION

The hackathon team from Pinnacle Solutions and Ontario Tech University used a web camera, the Internet of Things and SAS® Machine Learning to analyze movement, determine a risk score for falling and spot changes that could assist in early detection of disease.

Project details

"Using SAS AI and machine learning, we can build models to use this unique data to enable doctors, insurers, patients, athletes and military personnel to track identities and monitor health in a new way by analyzing the person's movement."

Pinnacle Solutions



Next story:
Combating childhood obesity

Digital tools help combat childhood obesity

CHALLENGE

Childhood obesity is one of the most serious public health challenges of the 21st century. Obesity can harm nearly every system in a child's body, and overweight youth have substantially higher odds of remaining overweight or obese into adulthood, increasing their risk of disease and disability later in life.

Read more

SOLUTION

Two top teams, one from Brazil and one from Sweden, tackled this problem. The Swedish team used AI and visual analytics to build a digital representation of a society. This "digital twin" provides new opportunities to collect and use childhood obesity data to carry out virtual interventions and simulations that help predict outcomes and prioritize actions and spending in the real world.

The Brazilian team built a digital tool that uses AI to interpret and connect data and people, providing information for families about their child's nutritional status and recommendations for dealing with the problems detected. Health care providers will have quick access to data so that they can monitor, diagnose and help solve problems.

Project details
SWEDISH TEAM:
DIGITAL COMMUNITY TWIN

Project details
BRAZILIAN TEAM: TUPÃ FIT

"By collecting municipal and regional data, a digital representation of society can be built. In the digital twin, data can be used to create a baseline and then continuously analyzed to see what effect different measures have on child health."

Maja Engsner
Epidemiology and health systems research, Uppsala University

"Our solution, called Brazil 2030, consists of two interconnected systems based on AI algorithms, an app for mobile devices and a website. The interface offers tailored recommendations on indicators gathered from governmental data sets, such as BMI and the family income, along with alerts about the child's nutritional state."

Adalcino Júnior Araújo Tavares
Researcher, Universidade Estadual da Paraiba

Next story:
Making surgeries safer

Computer vision increases surgical precision, ensures patient safety

CHALLENGE

Gall bladder removal is one of the most common surgeries worldwide. When the surgical team fails to recognize the anatomy properly, an injury to the bowel duct can occur, causing patients to face several more operations and, in some cases, lifetime disability.

Read more

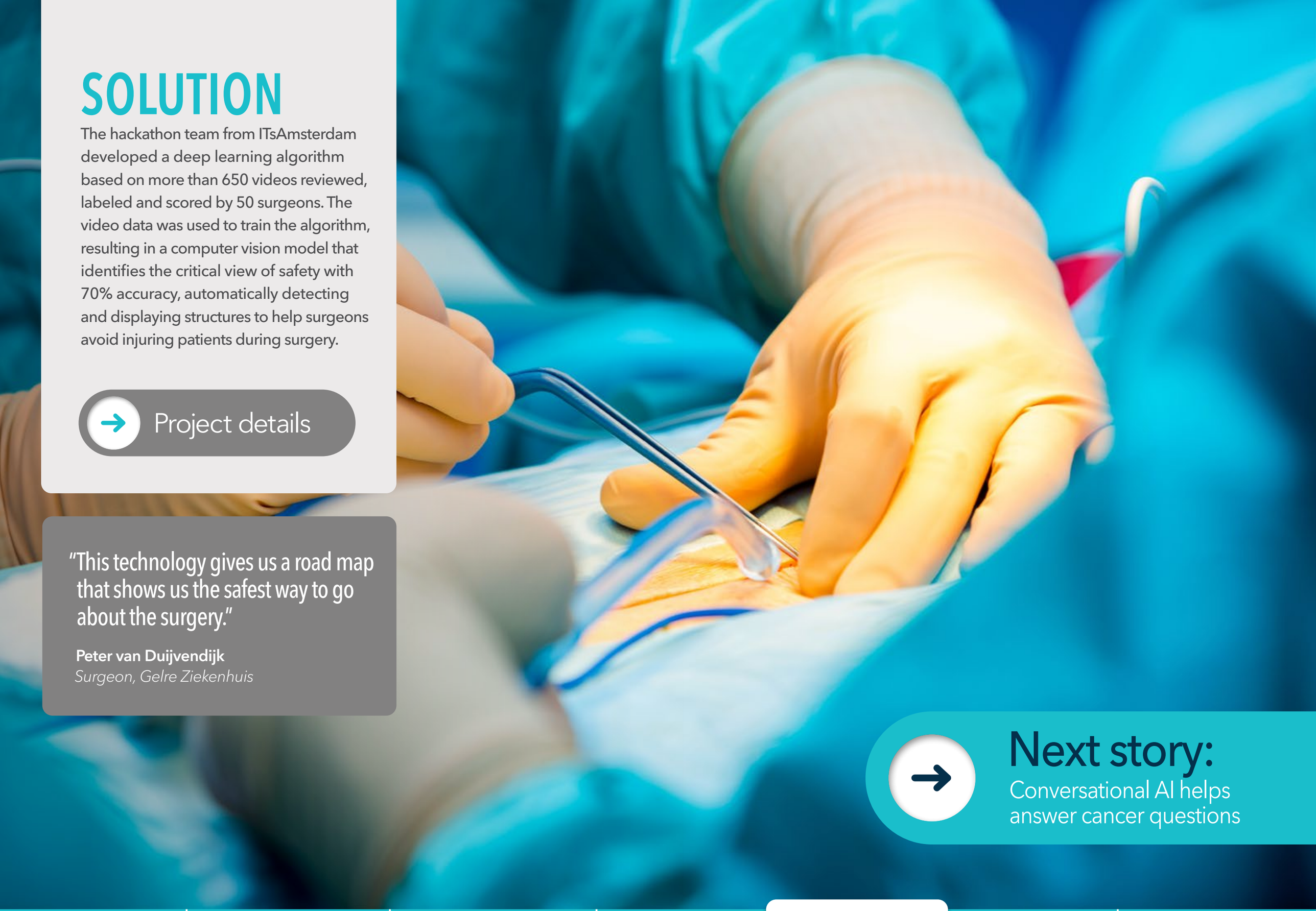
SOLUTION

The hackathon team from ITsAmsterdam developed a deep learning algorithm based on more than 650 videos reviewed, labeled and scored by 50 surgeons. The video data was used to train the algorithm, resulting in a computer vision model that identifies the critical view of safety with 70% accuracy, automatically detecting and displaying structures to help surgeons avoid injuring patients during surgery.

Project details

"This technology gives us a road map that shows us the safest way to go about the surgery."

Peter van Duijvendijk
Surgeon, Gelre Ziekenhuis



Next story:
Conversational AI helps answer cancer questions

Chatbot answers questions for cancer patients, friends and family

CHALLENGE

The pandemic stretched health care institutions to the breaking point, and it is estimated that there will be thousands more cancer deaths because beds and helplines were overwhelmed with COVID-19 patients.

Read more

SOLUTION

To relieve some of that burden, the team from Butterfly Data developed a dedicated chatbot that uses conversational AI to answer questions about the disease. The chatbot also points cancer patients, family and friends to useful resources and local health services. Example questions include “What can I do to make them feel better?”; “How long are they going to survive this type of cancer?”; “What kind of food should I eat if I’m having chemotherapy side effects?”

Project details

“We’re not trying to pretend that this is a substitute for a doctor or for a caring human, but when a patient – or a patient’s friends and relatives – want to ask a simple question and be directed to some reliable resources, our chatbot could be the right answer.”

Sara Boltman
Founder/Data Scientist, Butterfly Data

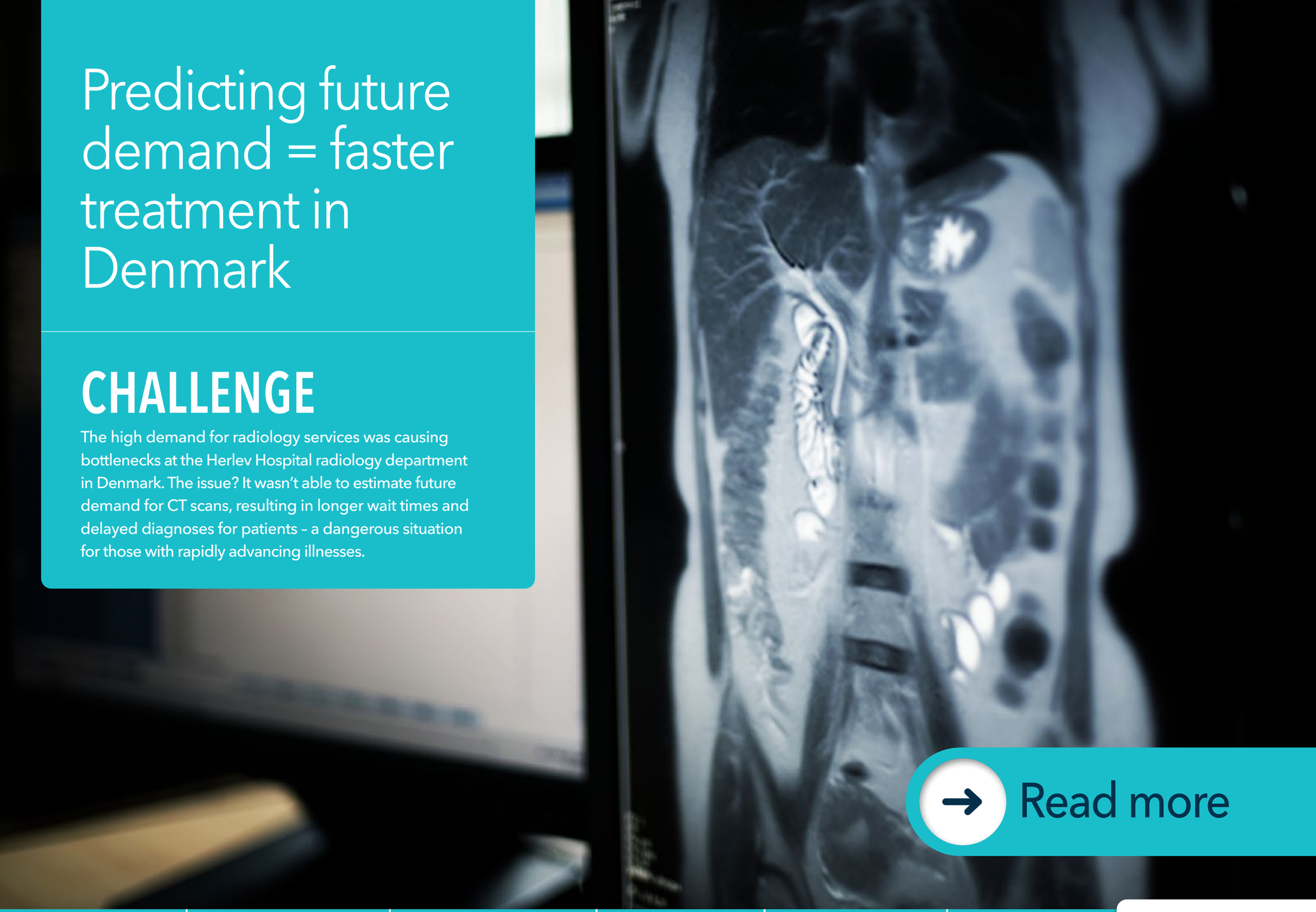
Next story:
Predicting demand = faster treatment

1 THE POWER OF AI | 2 ACCELERATING CANCER BREAKTHROUGHS | 3 MONITORING PATIENT STABILITY, PREDICTING DISEASE. | 4 COMBATING CHILDHOOD OBESITY | 5 MAKING SURGERIES SAFER | 6 ANSWERING QUESTIONS ABOUT CANCER | 7 PREDICTING DEMAND = FASTER TREATMENT

Predicting future demand = faster treatment in Denmark

CHALLENGE

The high demand for radiology services was causing bottlenecks at the Herlev Hospital radiology department in Denmark. The issue? It wasn't able to estimate future demand for CT scans, resulting in longer wait times and delayed diagnoses for patients – a dangerous situation for those with rapidly advancing illnesses.



Read more

SOLUTION

The consultants from SAS Partner Carve used SAS® Viya® and historical data to create visual analytics that model detailed forecasts of CT scanner capacities for up to 12 weeks. This allows Herlev Hospital to understand demand and schedule staff and appointments accordingly, helping both the patients and the doctors.

Project details

"We can use [the model] as a management tool. Instead of fighting against lack of capacity, we could focus on increasing capacity."

– Preben Thomassen, Head of Radiography, Herlev Hospital

How can SAS inspire you? These stories are just the beginning – explore what SAS Viya on Microsoft Azure could achieve for your organization.

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POWER OF THE PARTNER

At SAS, we love bold questions. And when we combine our analytics leadership with the innovative technology and expertise of our partners, we help our customers turn data into answers. That's the kind of curiosity that moves the world forward. That's the **Power of the Partner**.

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