

IMPROVING DIAGNOSIS ACCURACY AND SAVING LIVES

BACKGROUND

The echocardiogram is one of the most prescribed diagnostic tests in cardiology. It provides an incredibly complex and multidimensional data set, impossible to process entirely at the brain level. When physicians record the echocardiogram of a patient, the information is tracked in a spreadsheet of approximately 30 columns and more than 50 rows—all of which the physician must review manually line by line. Moreover, when physicians use echocardiograms to diagnose a patient, they commonly use only seven attributes among the thousands of attributes available in the data to make a diagnosis. This in itself reduces the potential accuracy of the diagnosis.

CHALLENGE

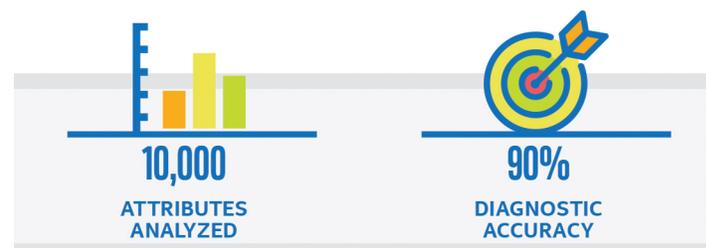
The director of cardiac ultrasound research and associate professor of medicine at a large New York City hospital, needed a way to accurately identify disease patterns resulting from echocardiograms in order to improve diagnostics and save more lives. Specifically, he wanted to distinguish between two disparate diseases: cardiomyopathy, which directly impacts the heart muscle and often leads to heart failure, and pericarditis, which acts as if the heart is involved but doesn't actually affect the heart. While both diseases present with similar heart conditions, the treatments are vastly different. For pericarditis, the treatment may include medication and, rarely, surgery. However, if the diagnosis is cardiomyopathy the patient undergoes medical management (i.e., a pacemaker), or in extreme cases, a heart transplant. Misdiagnosis of these disease conditions can put the patient's life at risk and be very expensive for the hospital. The physician, therefore, looked to Intel® SaffronMemoryBase™ to help his team increase the diagnosis accuracy of these medical conditions.

SOLUTION

Working with the Intel® Saffron™ Cognitive Solution, the cardiologist initiated a blind study comprising 15 patients with constrictive pericarditis and 15 patients with restrictive cardiomyopathy. When the multi-dimensional echocardiography diagnostic data was ingested into Intel Saffron Memory Base, the data consisted of 10,000 attributes per heartbeat per patient compared with only seven attributes commonly used by physicians. The attributes were collected from 90 metrics in six locations of the heart and 20 times within a single heartbeat.

RESULT

The Saffron Cognitive Solution was not only superior in computational speed than the traditional tools physicians normally use, but also significantly better in diagnostic accuracy. Participating physicians overall had a 56% rate of diagnostic accuracy. The doctor discerned the similar heart conditions with 76% accuracy by comparison. In order to compare these results to a traditional reference method commonly used in this clinical setting, the doctor also used a widely accepted statistical approach like R's program C-trees, which resulted in only 54% accuracy. The Saffron Cognitive Solution's accuracy rate proved significantly greater at 90%; the cognitive computing technology has demonstrated the ability to identify patterns and classify distinct disease states more quickly and accurately than even the most highly trained cardiologists.



WHY SAFFRON COGNITIVE SOLUTIONS



Unprecedented Accuracy

Provides customers with the highest degree of data accuracy—the proof is in our results.



Speed-to-insight

Provides customers faster speed-to-insight to quickly see the actionable knowledge in their data.



Full Transparency

Gives customers the explanation and reasoning behind the results of their data.



Model-free and rule-free

Dynamic and not constrained by rules and models—incrementally learns and adapts in real-time from incoming data and human feedback.



Learns on Sparse Data

Learns on sparse data so customers don't need volumes of data to get started.



High ROI

Proven track record of high ROI for leading enterprises across industries and use cases.



Time-to-value

Customers can rapidly unlock value in their data (i.e., weeks rather than months).

LEARN MORE

To find more information about Intel Saffron Cognitive Solutions, go to www.saffrontech.com.