CASE STUDY

Body Biolytics Applies RapidMiner Predictive Analytics to Biometric Big Data, Wins Under Armour Challenge

Customer
Body Biolytics

Location
US

Industry
Wearable Devices

"RapidMiner is extremely powerful, has the best operators, and can handle Big Data from wearables. It also allows us to rapidly prototype very sophisticated analytics, machine learning and classification applications, saving significant time and money."

- Kevin Logan
CEO

The Situation

Based in Stonington, Conn., Body Biolytics is focused on applying activity-recognition software to the sport, fitness and health industries. The company's technology is field-proven, having been installed on over 40 U.S. Navy ships to keep a close watch on machinery health, by collecting data from hundreds of on board sensors. Using predictive analytics on this data, the software predicts machinery failures, allowing maintenance crews to take corrective action in advance of any problems. Similarly, Body Biolytics can capture physical activity data from multiple body sensors on wearable devices, and apply the same technology to classify activities, improve performance, and anticipate harmful conditions that may arise during physical activities.

"Wearable devices are by far one of the leading and most popular Internet of Things (IoT) innovations. So we're working on sports and fitness monitoring, and the growing demand for useful, actionable information that can be produced from body sensor data generated at a rate of hundreds of times per second," said Kevin Logan, CEO and founder of Body Biolytics. "At this rate, state of the art, wearable sensor data quickly becomes Big Data, which is much more valuable than the often inaccurate and less frequently recorded data from pedometer and other traditional activity reporting devices. This Big Data allows us to go far beyond reporting, and establish performance baselines, precisely track performance improvements, and predict things like over-exertion."

The Solution

One important tool for Logan is RapidMiner predictive analytics software. "I found RapidMiner about five years ago, when I was at MACSEA developing health monitoring solutions for Navy ships. A friend had been using the software while working on Wall Street, and retired very comfortably, so I figured there must be something to RapidMiner," he said. "I downloaded the software and was surprised at how fast I was able to use it and get a lot of work done very quickly. RapidMiner's intuitive drag and drop interface for designing predictive models is powerful stuff , especially when being able to connect to any data source."

Logan also uses the software's neural network, support vector machine (SVM) and Bayes classification functions. Because neural networks are based on a typical body's central nervous system, they are ideal for machine learning that can build computing systems using wearable device data. Complementing this, SVM models can automatically learn from the data and accurately classify it. Finally, Bayes classifiers minimize the probability of misclassification of data.

"Altogether, RapidMiner's features and functionality enable Body Biolytics to process and analyze a lot of wearables data quickly, accurately and intelligently. This provided us with a significant advantage in developing the winning technology earlier this year for the Under Armour Armour39 Challenge to improve the performance of the company's performance monitoring system," said Logan. "Out of the four Challenge categories, we focused on accurately identifying what exercise a user was doing while wearing an Armour39 chest strap. Using its accelerometer data, which is generated 100 times per second, on three axes, with RapidMiner, we were able to accurately classify which gym weight training exercises the user was doing. Because there was such a short deadline, it would've been impossible to build and test 11 classifier design models without RapidMiner. It dramatically shortened the prototyping cycle."

Body Biolytics is now applying this technology to other wearables, which are being bought by millions of consumers every year. "There is a huge market for highly accurate information that can be produced from wearables data, and we're capitalizing on that with RapidMiner to move from recording data to engaging with those who use wearables. RapidMiner is extremely powerful, has the best operators, and can handle Big Data from wearables. It also allows us to rapidly prototype very sophisticated analytics, machine learning and classification applications, saving significant time and money."

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