Finding the next football star with artificial intelligence

SCISPORTS

SAS Viya enables real-time analysis of streaming soccer data.

Artificial Intelligence

In Practice

SciSports achieved this using • SAS® Viya® • SAS® Visual Data Mining and Machine Learning • SAS® Visual Analytics • SAS® Visual Statistics

Dutch sports analytics company SciSports uses emerging tech to innovate on the pitch

Football. Soccer. The beautiful game. Whatever you call it, the world's most popular sport is being transformed by a Dutch startup bringing artificial intelligence to the pitch.

SciSports, founded in 2012 by two self-proclaimed football addicts and data geeks, is innovating on the edge of what's possible. The sports analytics company uses streaming data and applies machine learning, deep learning and artificial intelligence to capture and analyze this data, making way for innovations in everything from player recruitment to virtual reality for fans.

Our ambition is to bring real-time data analytics to billions of soccer fans all over the world. By partnering with SAS, we can make that happen.

Giels Brouwer · Founder and CEO · SciSports

Player selection goes high tech

In the era of eight-figure contracts, player recruitment is a high-stakes game. The best teams aren't those with the best players, but the best combination of players. Scouts and coaches used observation, rudimentary data and intuition for decades, but savvy clubs are using advanced analytics to identify rising stars and undervalued players.

"The SciSkill Index evaluates every professional football player in the world in one universal index," says SciSports founder and CEO Giels Brouwer. The company uses machine learning algorithms to calculate the quality, talent and value of more than 200,000 players. This helps clubs find talent, look for players that fit a certain profile and analyze their opponents.

Every week, more than 1,500 matches in 210 leagues are analyzed by the SciSkill technology. Armed with this insight, SciSports partners with elite football clubs across Europe and other continents to help them sign the right players. This has led to several unexpected – and in some cases lucrative – player acquisitions.

For example, a second-division Dutch player didn't want to renew his contract, so he went out as a free agent. A new club reviewed the SciSkill index and found his data intriguing. That club wasn't too sure at first, because they thought he looked clumsy in scouting – but the data told the true story.

They signed him as the third striker, and he quickly moved into a starting role and became their top goal scorer. His rights were sold at a large premium within two years, and now he's one of the top goal scorers in Dutch professional football.

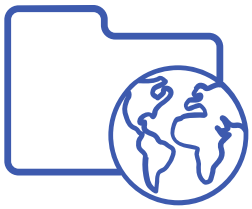
Real-time 3-D game analysis

Traditional football data companies generate data only on players who have the ball, leaving everything else undocumented. This provides an incomplete picture of player quality. Seeing an opportunity to capture the immense amount of data happening away from the ball, SciSports developed a camera system called BallJames.

BallJames is a real-time tracking technology that automatically generates 3-D data from video. Fourteen cameras placed around the stadium record every movement on the field. BallJames then generates data such as the precision, direction and speed of the passing, sprinting strength and jumping strength.

“This forms a complete picture of the game,” says Brouwer. “The data can be used in lots of cool ways, from allowing fans to experience the game from any angle using virtual reality, to sports betting and fantasy sports.” He added that it can even help coaches on the bench. “When they want to know if a player is getting tired, they can substitute players based on analytics.”

SciSports – Facts & Figures



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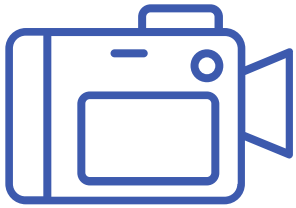
Universal index with every professional football player

200,000

Players analyzed in SciSkill Index



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Cameras around the pitch enable real-time analysis

Machine learning and deep learning

SciSports models on-field movements using machine learning algorithms, which by nature improve on performing a task as they gain more experience. On the pitch, BallJames works by automatically assigning a value to each action, such as a corner kick. Over time, these values change based on their success rate. A goal, for example, has a high value, but a contributing action – which may have previously had a low value – can become more valuable as the platform masters the game.

Wouter Roosenburg, SciSports Chief Technology Officer, says artificial intelligence and machine learning will play an important role in the future of SciSports and football analytics in general. “Existing mathematical models model existing knowledge and insights in football, while artificial intelligence and machine learning will make it possible to discover new connections that people wouldn’t make themselves.”

To accurately compile 3-D images, BallJames must distinguish between players, referees and the ball. SAS Event Stream Processing enables real-time image recognition using deep learning models. “By combining our deep learning models into SAS® Viya®, we can train our models in-memory in the cloud, on our cameras or wherever our resources are,” says Roosenburg.

The ability to deploy deep learning models in memory onto cameras and then do the inferencing in real time is cutting-edge science. “Having one uniform platform to manage the entire 3-D production chain is invaluable,” says Roosenburg. “Without SAS Viya, this project would not be possible.”

Adding oomph to open source

Previously SciSports used exclusively open source to build models. They now benefit from an end-to-end platform that allows analytical teams to work in their language of choice and share a single, managed analytical asset inventory across the organization. According to Brouwer, this enables them to attract employees with different open source skills yet still manage the production chain using one platform.

“My CTO tells me he loves that our data scientists can do all the research in open source and he doesn’t have to worry about the production of the models,” says Brouwer. “What takes 100 lines of code in Python only takes five in SAS. This speeds our time to market, which is crucial in sports analytics.”

Since its inception, SciSports has quickly become one of the world’s fastest-growing sports analytics companies. Brouwer says the versatility of the SAS Platform has also been a major factor. “With SAS, we’ve got the ability to scale processing power up or down as needed, put models into production in real time, develop everything in one platform and integrate with open source.

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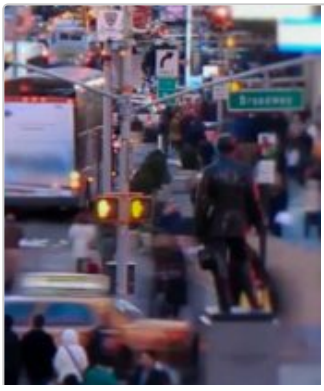
Next steps



Customer Stories

SAS Analytics in Action

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