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EDITOR'S NOTE

Machine learning for everyone

It's how YouTube is able to suggest videos for you, based on others you've watched or liked, and why you're shown particular adverts online, after googling for similar products. It's why you get a call from the bank if an unusual transaction on your account indicates you might have been the victim of fraud, and how certain email gets flagged as spam. It's why Google Maps and Waze can recommend driving routes and provide estimated travel times at different times of day, and how Google Assistant and Siri can interpret what you're saying.

Machine learning is part of our everyday lives, and is increasingly being used in new and innovative ways as various industries recognise its potential. It has already been widely adopted by sports analytics companies, for example, to predict outcomes of each game and overall match winners for betting organisations, and to help team managers recruit promising players or tweak game strategy based on past performance. SciSports' BallJames system even allows real-time analysis of soccer games, because every movement on the pitch is captured from three or four angles by 14 video cameras around the stadium and automatically processed into 3D data. In recognition of the advances made in this field, the January 2019 issue of the Springer US journal *Machine Learning* was devoted entirely to machine learning in soccer.

More recently, the prestigious *New England Journal of Medicine* published an article on 4 April by scientists at Harvard Medical School and Google, offering a blueprint for integrating machine learning into the practice of medicine. In an accompanying press release, lead author Dr Isaac Kohane noted that machine learning models can be trained on tens of millions of

electronic medical records, while a human physician would not see more than a few tens of thousands of patients in an entire career. He stressed, however, that the models would only be as good as the data inputted, and that physicians need to understand the models' limitations and not rely on them at the expense of their own vigilance in diagnosing disease and recommending treatment protocols.

Google is doing much to advance the uptake of machine learning, offering free courses online and making its software library TensorFlow available as an open-source platform to build and deploy machine learning models. The TensorFlow website features a number of excellent videos showing how the platform has been used, from transcribing and interpreting medieval manuscripts in the Vatican archives, to predicting extreme weather events globally and identifying diseases of cassava crops in Tanzania. Google has also opened a research centre for artificial intelligence in Ghana to take on Africa-specific challenges, such as those in healthcare, education and agriculture, and supports the African Master's in Machine Intelligence, a fully funded graduate programme at Rwanda's branch of the African Institute of Mathematical Sciences (AIMS).

In this issue, we highlight some machine learning applications from the South African science and engineering community.

Sue Matthews
QUEST Editor



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