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By RACHAEL KING



Left to right: Xavier Quintana, senior IT architect, and Georges Nahon, CEO at Orange Silicon Valley — Rachael King / WSJ

French telecom operator Orange SA has begun to test machine-learning software to help it prevent fraud that occurs on its mobile network.

Orange is trying to stop a type of fraud that happens when people illegally use part of Orange's network for cut-rate telephone calls. "The problem is that the fraud moves so quickly that it has been difficult for Orange's static algorithms to detect it," Georges Nahon, CEO of Orange Silicon Valley, a research and development division of the operator, told CIO Journal.

Orange began testing software from startup Skymind that uses deep learning, an advanced form of machine learning, a system designed to better identify patterns and make predictions as its algorithms are exposed to more and more new data. The software sorts through huge quantities of telephone records to recognize changing patterns of fraud.

Skymind uses so-called neural networks that are inspired by the way biological nervous systems such as the brain process information. The end result, said Mr. Nahon, is that the software can begin to ask questions about the data that humans wouldn't necessarily think to ask, and detect in the data patterns relating to fraud that might otherwise evade detection.

Fraud detection is just one of the many burgeoning enterprise applications for deep learning. The market for deep-learning applications will continue to grow as businesses see revenue potential in the data generated by smartphones and sensors. Other areas that are ripe for deep learning include electronic medical records and telecom networks.

The annual software revenue for enterprise applications of deep learning will increase to

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\$10.4 billion in 2024 from \$109 million in 2015, according to a November report from market intelligence firm Tractia.

For Orange, which has moved its deep-learning testing from proof of concept to pilot, the goal is preventing fraudsters from offering cut-rate calling by routing calls over the Internet and illegally using Orange's mobile network for the last mile of the call. That illegal traffic can make the network slow for legitimate customers.

But it's not easy for Orange to determine real from illegal traffic, given the hackers access to sophisticated technology for evading detection.

The software is looking for ever-changing telephone numbers associated with the fraudulent carriers. The criminals pick up and drop telephone numbers in much the same way a hacker would use some else's credit card number. Once a number is identified as being potentially fraudulent, it is passed to a human expert who will determine if it is indeed fraud by investigating it, said Xavier Quintuna, senior IT architect at Orange Silicon Valley. Those security officers then teach the machine which cases were indeed fraudulent, validating new methods the software comes up with for detecting fraud, and the system gets smarter.

Part of the goal is to better utilize those security officers by surfacing incidents that are more likely to be fraud. "If we have 20 security officers and they have 1,000 records to find and now we give them 50, they'll be faster to detect them," said Mr. Quintuna.

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