TRENDS IN DATA SCIENCE 2019

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Here at Mudano, we're always on the lookout for new and exciting opportunities. We believe that technology plays a key transformational role in today's world. Staying on top of the innovation wave is critical to our success and is a key part of how we deliver even greater value to our customers.

That's why we dedicate significant resources to horizon-scanning: looking for the next generation of development in data technology.
Based on their extensive research, our Data Science experts have picked out their top 7 trends for machine learning in 2019:

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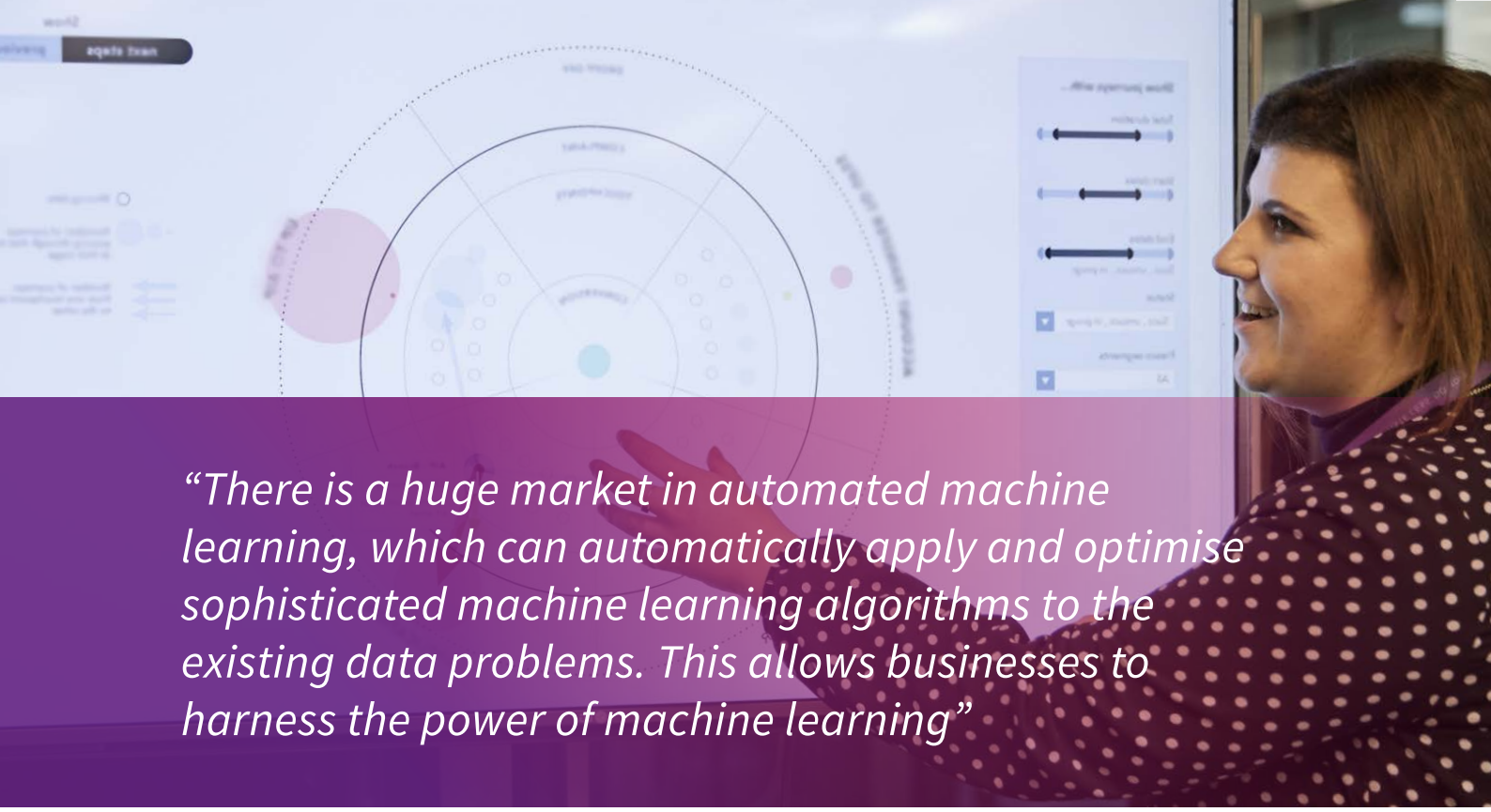
1. This year reinforcement learning is maturing and moving out into real world applications. We've seen the most complex board games played at a superhuman level by a game-agnostic algorithm called AlphaZero, developed by a Google company called DeepMind. The amazing fact is that this algorithm wasn't given any information about the game apart from the basic rules. It plays against itself, slowly learning and improving after each game. After millions of games have been played it can outperform any human, or even any human designed game specific program. Why does this matter? Such reinforcement learning algorithms can now be applied to any problem that has well-defined rules, such as protein folding, which is used to create new drugs that save lives.

2. Autonomous vehicles are moving out of the lab and transforming the world around us. This application was enabled by advances in reinforcement learning, imaging technology and the amount of computing power available. The barrier to entry isn't technological anymore - autonomous cars are already an order of magnitude safer than human drivers on some roads. The introduction of autonomous cars will have a large impact on the economy. What happens to millions of truck and taxi drivers? What about businesses next to the highway that rely on truck drivers? What happens to the car insurance industry when there'll be virtually no accidents, and what happens to responsibility? These are just some of the questions that will need to be addressed before the technology becomes embedded in the mainstream.

3. Methodology and tools are being rapidly developed so machine learning practitioners can open the "black box" of their model



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to explain what it’s doing underneath. Big financial services companies are investing millions into developing explainable AI. Making your model explainable can increase confidence in your model, customer trust and reduce time to adoption. New accessible tools are constantly being developed and made freely available.

4. AI fairness, privacy and compliance. How do you modify your ML models to be fully compliant with GDPR? The benefits of GDPR are well documented from an individual’s perspective - but present legal and ethical challenges that must be resolved before Machine Learning models can be applied.

5. There is a huge market in automated machine learning (AutoML), which can automatically apply and optimise sophisticated machine learning algorithms to the existing data problems. This allows businesses to harness the power of machine learning without needing to hire very scarce (and expensive) ML professionals, and to focus on their business specific problems.

6. Machine learning for health. CRISPR gene editing technology enabled precise editing of genetic sequence in live patients. Designing a molecule in such a way that it edits the correct part of the genetic sequence is a complex and expensive procedure, however recently machine learning has entered this domain and shown promising results of being able to reduce costs drastically. This technique is already being used to find cures for some types of cancer, such as leukemia.

7. Language applications are on the rise. There are a couple of reasons for this: advancements in transfer learning and the availability of free tools. Transfer learning is the process of reusing a model trained in one area in another context. For example, you might train a Machine Learning model to predict the number of removed words from sentences using data drawn from all the Wikipedia entries, then use the learnt model to solve your language problems. This technique has been used to train an automated Debater, that competed against a debating champion in front of the live audience! The technology is also used to solve a more common problem of improving customer service by using chatbots to automate simpler customer-facing tasks.

Whatever your interest in Data Science is, we think 2019 is going to be a massive year in the application of data technology to real-world business problems. We will keep you regularly updated on the trends and their realisation.

Experiment with the power of data science in some of your core business processes.