



Technology and Innovation

Next-Gen Data Analytics Insights with Graph Technology

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Biography

Alicia Frame is the Lead Product Manager and Data Scientist at Neo4j (<https://neo4j.com/>), where she works on the company's Product Management team to set the roadmap and strategy for developing graph-based machine learning tools.

She earned her Ph.D. in Computational Biology from the University of North Carolina at Chapel Hill and a B.S. in Biology and Mathematics from the College of William and Mary in Virginia.

Alicia has over eight years of experience in enterprise data science at BenevolentAI, Dow AgroSciences, and the EPA.

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Abstract

Graph technology is increasingly at the heart of new waves of graph-powered analytics. But what's driving this revolution? This powerful and innovative technique can calculate the 'shape' of the surrounding network of each piece of data through graph 'embeddings' – enabling far better machine learning predictions. In this article, the author discusses why the future of the next wave of data science lies with graph data approaches, as well as recent research in this area, and the potential of graph-powered data science for clever predictive AI.

Introduction

The pace of data science adoption by business is accelerating. Increasingly, organizations are applying graph-powered analytics to connected data to discover insights and power innovation.

So what's driving this revolution? Graph-powered data science – which will be an essential part of the enterprise data scientist's toolbox over the next decade. Most data science teams in the corporate world are still learning how to leverage connected data in their machine learning work. However, adopters of graph data science report their best machine learning work is unlocked with graph technology.



A powerful technique

In its 2020 report on data and analytics tech trends, Gartner¹ predicts that “Finding relationships in combinations of diverse data, using graph techniques at scale, will form the foundation of modern data and analytics,” and graph data science proves highly successful in many contexts, leveraging the connections between data points for more accurate and interpretable predictions.

Graph data science is typically used to power strategic predictions to help data scientists answer exacting business questions and explain outcomes. That is because it is an inherently powerful technique that can reason about the ‘shape’ of connected context for each piece of data through graph algorithms. As a result, graph data science enables rich machine learning predictions.

Gartner has polled companies about their use of AI and machine learning techniques and found a remarkably high 92%² said they plan to employ graph technology within five years.

Graph data science in action

One example of graph data science success is New York-Presbyterian Hospital’s analytics team’s use to track and contain infections. The hospital’s developer team says graph data science offers an efficient way to connect all the dimensions of an event – the what, when and where it happened.

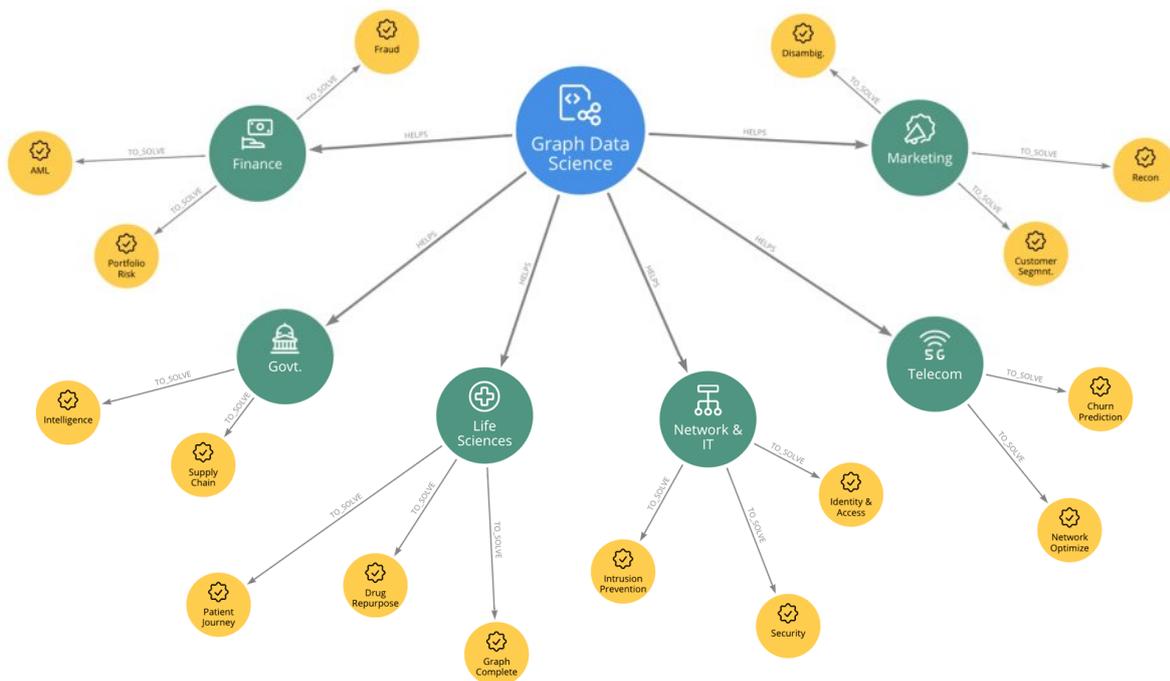


The team created a ‘time’ and ‘space’ tree to model all the treatment rooms onsite, surfacing a large number of inter-relationships. A separate ‘event’ entity was subsequently included to connect the time and location trees. The resulting graph-enriched data model is empowering the hospital to identify and contain any outbreaks before they spread. Even better, this positions the analytics team to analyze numerous other kinds of hospital events, from tests to surgeries.



Graph data science is also supporting global medical device manufacturer Boston Scientific isolate the causes of product faults. Prior to the introduction of graph data science, separate internal teams, often in different countries, collaborated on such problems together, but staff had to resort to analyzing data in spreadsheets. This led to inconsistencies and difficulty tracking down the underlying sources of defects. Now Boston Scientific says its new graph data science approach has initiated a more streamlined means for analyzing, coordinating and improving its manufacturing methods across its locations.

Meanwhile, the UK government’s central online presence, GOV.UK is exploring the power of graph data science. By using graph technology, a new GOV.UK application learns continuous feature representations that can be used for various machine learning tasks, such as recommending content. Finally, leading media and marketing services company Meredith reports that graph algorithms allow the transformation of page views into pseudonymous identifiers with rich browsing profiles. This step translates into significant revenue gains and much improved customer experience (CX).



In conclusion

Businesses are being faced with extremely complex challenges and opportunities which require more flexible, intelligent approaches, so now is the perfect time to evaluate the proven potential of graph data science.

Reference

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