Interactive Media for Understanding ML Methods

A Case-Study on Graph Neural Networks

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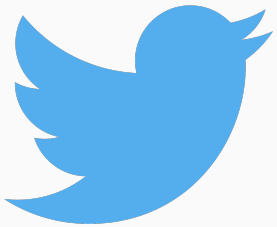
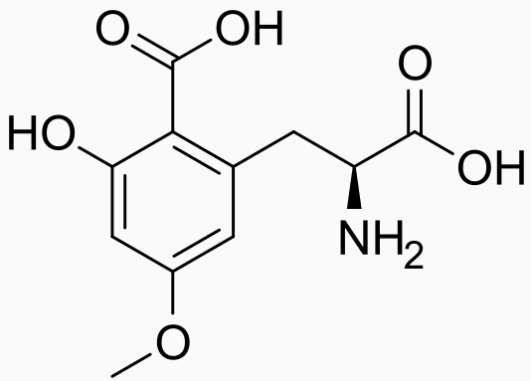
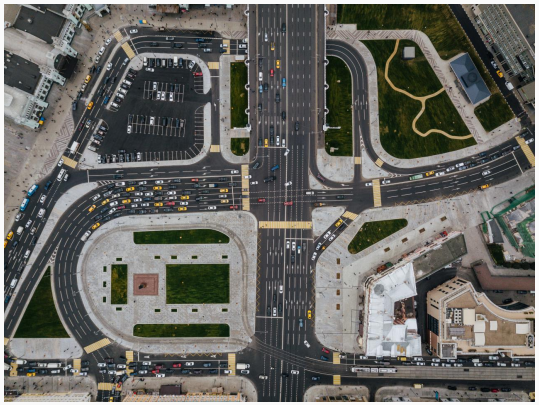
Graph Neural Networks

A family of neural networks that operate naturally on graphs!







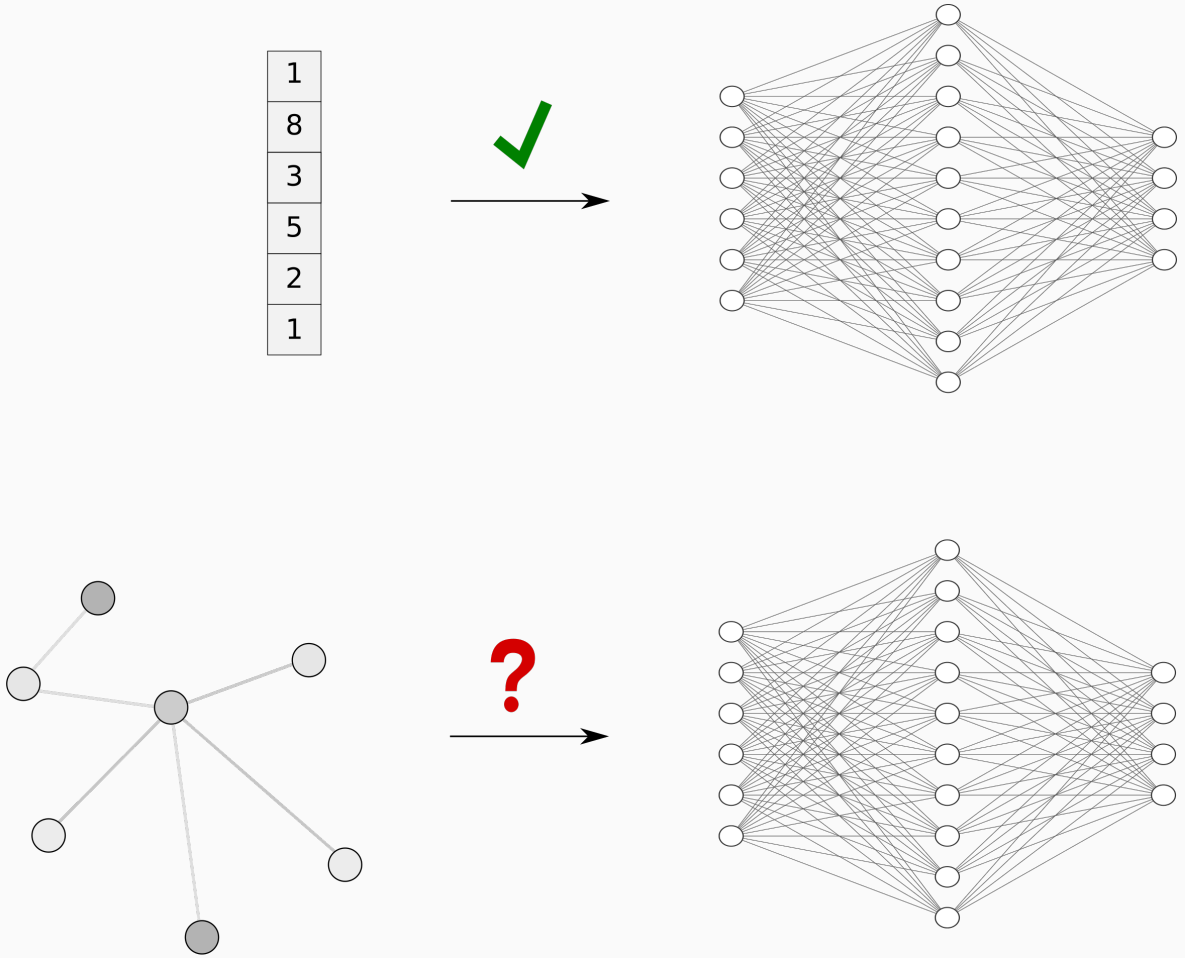
Graphs are everywhere: Social networks, molecules, and even traffic on the roads!

Graph Neural Networks

GNNs have become extremely popular for:

- Relational modelling.
- Physics simulations.
- Knowledge-graph completion.
- Molecular prediction.
- Model-based reinforcement learning.
- ...and many more interesting domains!

But how do GNNs work?



How do we compute over graphs? It is not clear what exactly GNNs do!

CNNs as Motivation

GNNs are inspired by CNNs (Convolutional Neural Networks)!

- CNNs are great on many image-related tasks!
- Images can be thought of as grid graphs.
- Can we generalize convolutions over grids to convolutions over arbitrary graphs?

We trace the story of GNNs, but interactively!

Our Contributions in Context?

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But, GNNs have traditionally been depicted by static images:

Visual descriptions of the GCN model (left) from Kipf & Welling (2017) and the GAT model (right) from Veličković et al. (2018) in their original papers.

It’s demo time!

Conclusion

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Exhibit currently under review at Distill.

Thank you!

You can reach me for feedback and questions at ameyasd@google.com.