Topological and geometric deep learning

TODO FIXME

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1 Definitions

CGN *(Convolutional Graph Neural Network)* — A type of GNN which generalizes the convolution operation to graphs. Often we encounter convolution while we work with grid-structured data like images, but here we use same idea (aggregate features of the neighbors) on nodes instead of pixels[2].

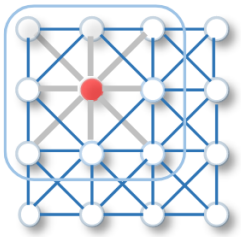

Figure 1: Convolution on image

Figure 2: Convolution on graph

GAT *(Graph attention network)* — A type of GNN which uses attention mechanism (also borrowed from 'casual' neural networks) which allows us to work with inputs of variable sizes and to focus on the most important features [1].

References

[1] Petar Veličković et al. “Graph Attention Networks”. In: *International Conference on Learning Representations* (2018). accepted as poster. URL: https://openreview.net/forum?id=rJXMpikCZ.

[2] Zonghan Wu et al. “A Comprehensive Survey on Graph Neural Networks”. In: *IEEE Transactions on Neural Networks and Learning Systems* 32.1 (2021), pp. 4–24. DOI: 10.1109/TNNLS.2020.2978386.