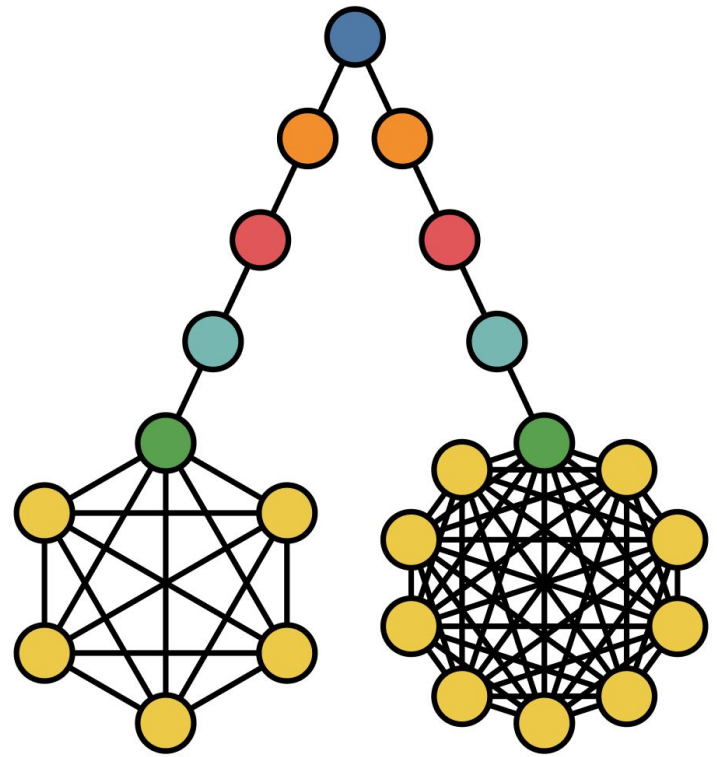
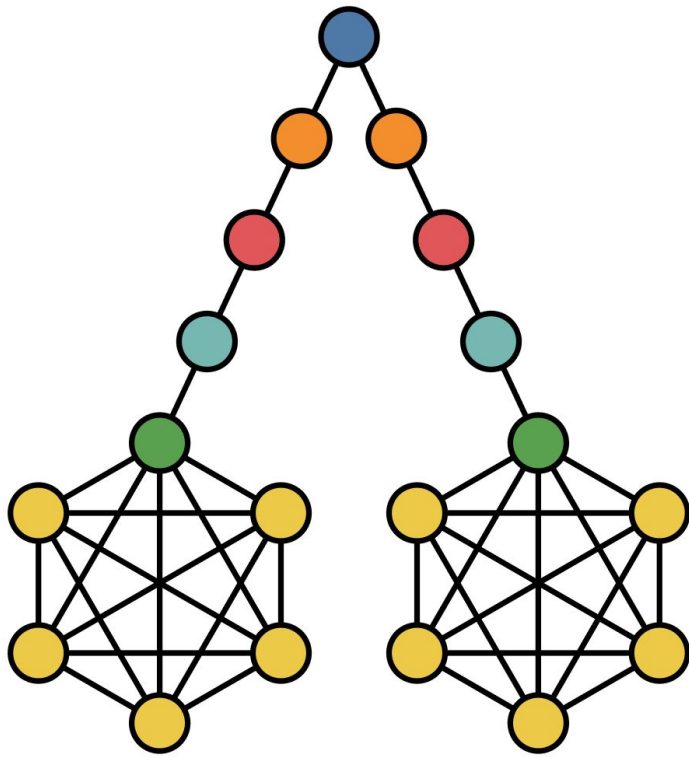


Real-time Analytics for Internet of Sports

| *Marie Curie European Training Network*

What I'm up to

Susanna Pozzoli, KTH



Not Only Degree Matters: Diffusion-Driven Role-Recognition presents an algorithm designed to recognize nodes playing the same role, even if different in degree, that is, number of neighbors.



Graph Neural Networks (GNNs) have established themselves as the state of the art of encoding the nodes in a graph into a low-dimensional space.

However, the parallel between *neural message passing* and *diffusion*, and thus *community detection*, suggests that GNNs tend to capture the *community* rather than the *role memberships* of the nodes.

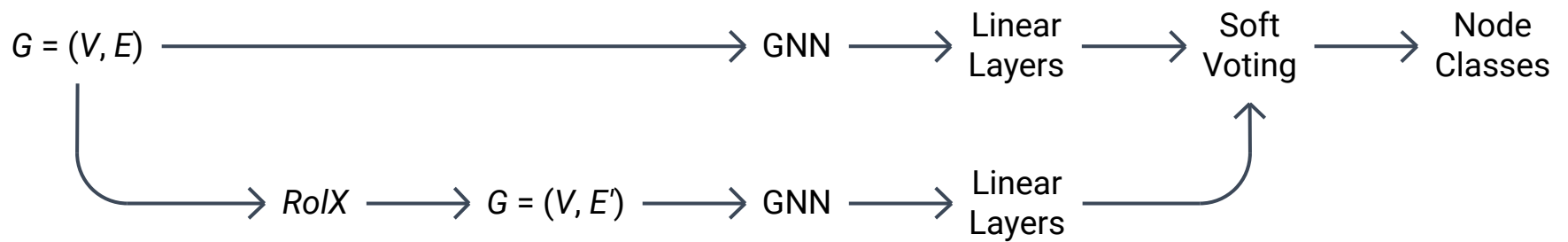
RC-GNNs

Embeddings at the Intersection of Communities and Roles presents RC-GNNs, which are a category of GNNs extended for the purpose of learning node embeddings at the intersection of *communities* and *roles*, as well as *features*.

RC-GNNs take advantage of both the embeddings learned by a GNN that is fed the graph as is and the embeddings learned by another GNN running in parallel that is fed a higher-order version of the graph, in which the nodes are connected according to the role memberships.



Attempt #1. Classes are predicted from the concatenation of the embeddings learned by the GNNs.



Attempt #2. Classes are predicted from the average of the probabilities learned by the GNNs.



- **Soft Voting.** Is it possible to learn the weights of the probabilities?
- Is it possible to compare RC-GNNs with GCNs, GATs, GINs, *etc.*?

Acknowledgements



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Tack! Tack!