NANYANG TECHNOLOGICAL UNIVERSITY
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Graph Neural Networks with Knowledge Graph

Solving Link Prediction tasks on Knowledge Graphs

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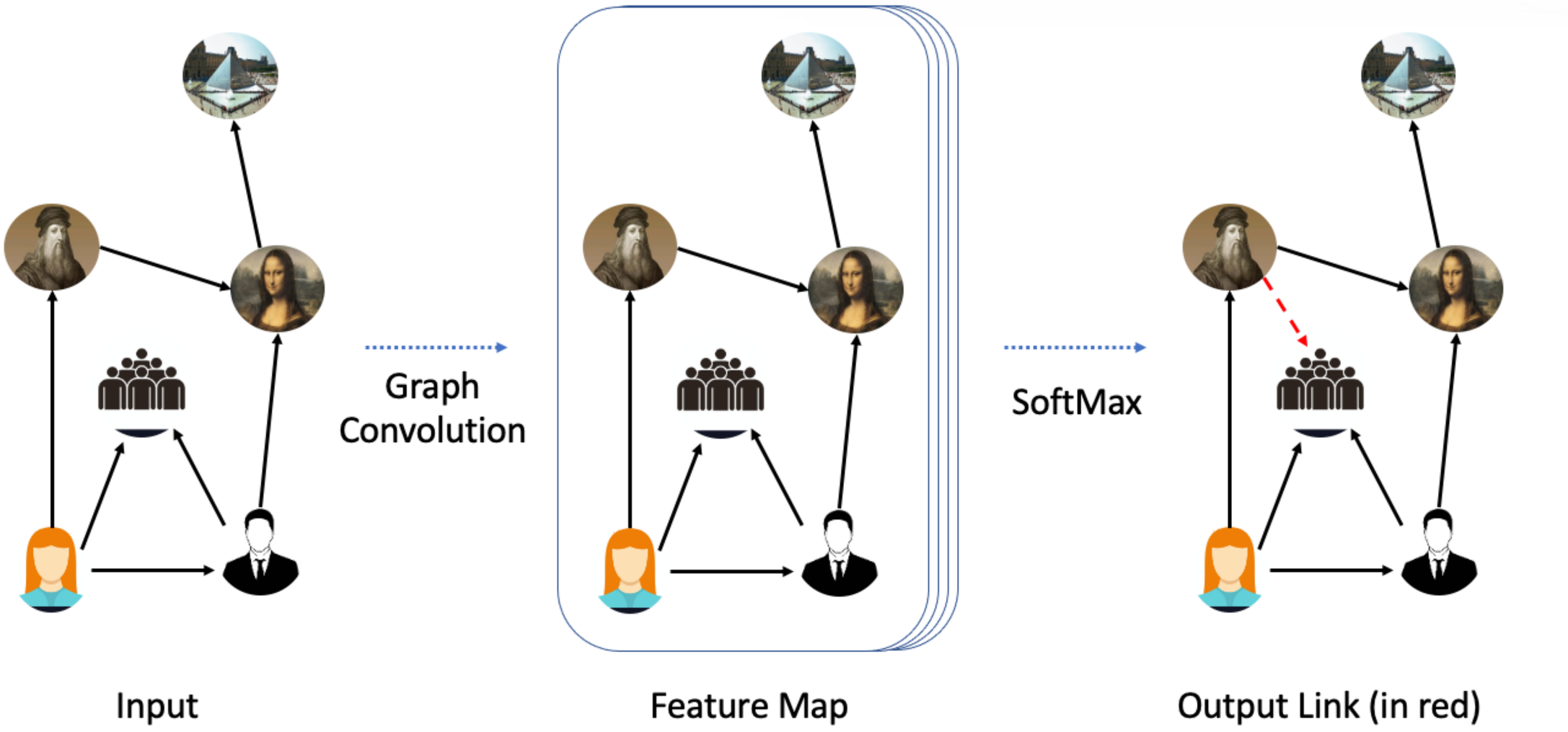
Motivation

Knowledge graphs contain factual information about the real-world. However, current knowledge graphs only contain a subset of the available information of the world. *Link Prediction* aims to uncover the unknown information through predicting new links between existing entities in the Knowledge Graph.



Graph Convnet

Procedure

1. Construct a **sub-graph** of the current Knowledge Graph
2. Using **Graph Convolutional Neural Network** to extract feature vectors of all the nodes in the graph.
3. **Multi-Layer Perceptron** uses the concatenated feature vectors of 2 neighboring nodes to predict the connecting edge class

Results Comparison (Mean Reciprocal Rank)

Models	FB15k-237	WN18	OGB-Wikikg	OGB-Biokg
GCN	0.347	0.615	0.107	0.485
R-GCN	0.748	0.724	0.195	0.619
Gated-GCN	0.749	0.684	0.192	0.506
RELG (our model)	**0.894**	**0.815**	**0.216**	**0.663**