

# Network Inference from Node Embedding: Deep Autoencoding

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# 1 Introduction

I started from the Zekarias T. Kefato's paper: *DeepInfer: Diffusion Network Inference through Representation Learning*.

The problem tackled in this paper (as described by its title) is inferring a network starting from series of interactions between the elements in play. The goal is to obtain a reconstruction as precise as possible of the actual **Interaction Network** without using any kind of exact information on the actual graph.

**Note:** for simplicity and immediacy sake, during the explanation I will make references to a specific example in order to show an instance of the problem:

**Twitter:** the interactions observed are formed by:

- *contagiant element*: the ones taken in consideration are the *hash-tags*

- *infection spreading*: and for each hashtag there's a list of users (with its respective time) that used it.

## 2 Reproduction of the SoA Technique

### 2.1 Brief Overview

The State of Art technique has precise, consequential steps:

- Cascade Linearization
- Node embedding
- Top Pairs fetching
- Inference evaluation

### 2.2 Description