

Neural Relational Inference for Interacting Systems

International Conference on Machine Learning (ICML 2018)

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2020-05-08

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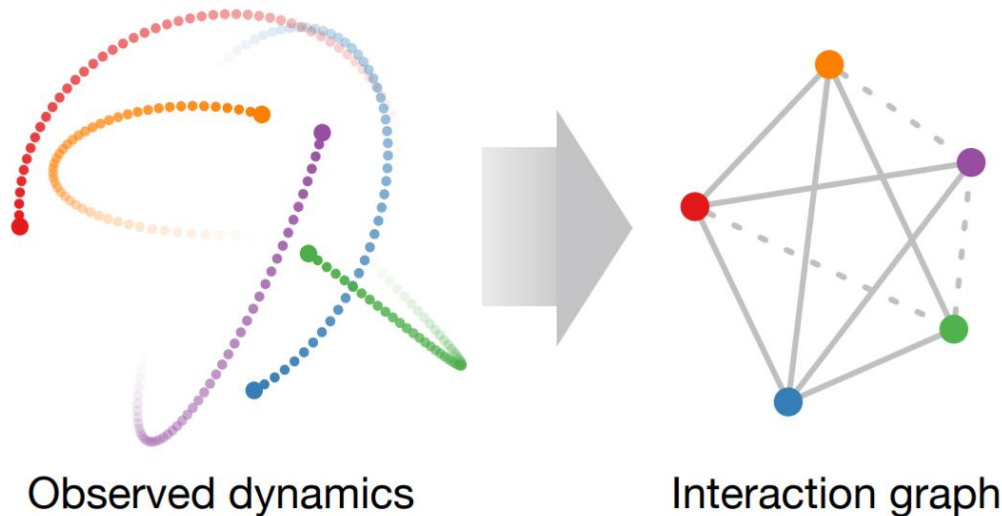


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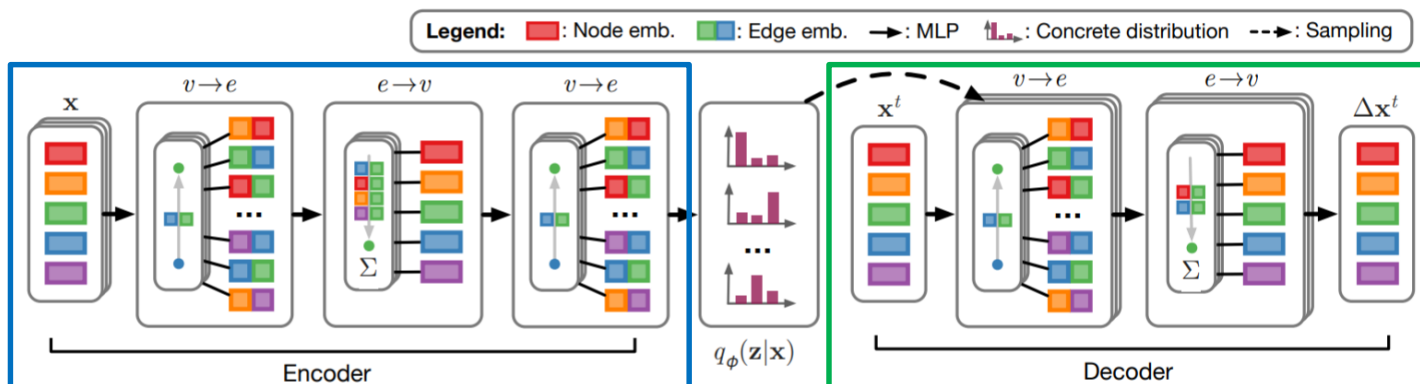
Introduction: Interacting System

- ❖ Interacting system is an **interplay of components** in dynamics
 - Example: A movement of basketball player can influence other basketball player
- ❖ Authors have proposed **Neural Relational Inference (NRI)** for modeling interacting system of physical dynamics



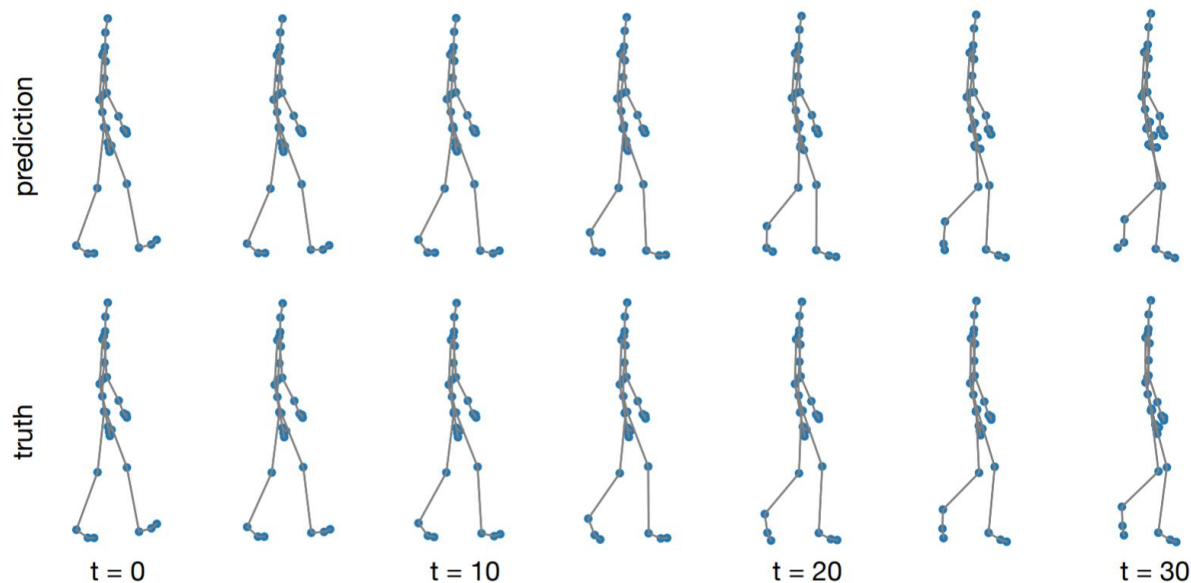
Methodology: Neural Relational Inference (NRI)

- ❖ An unsupervised model that address the problem of inferring an explicit interaction structure while simultaneously learning the dynamical model of the interacting system
- ❖ Takes the form of a variational auto-encoder based on Graph Neural Network (GNN)
 - Encoder: **Generates** latent interaction probability dist. (q_ϕ)
 - Decoder: **Learns** dynamical model (trajectory prediction)



Experiment & Conclusion

- ❖ Experiments for simulated physical systems shows that the NRI model can **accurately recover ground-truth interactions** in an unsupervised manner
- ❖ NRI model shows that it can **predict complex dynamics** and **find interpretable structures** in real motion capture and sports tracking data



Any questions?

