

Temporal Graph Neural Networks with Time-Continuous Latent States

Continuous Time Methods for Machine Learning,
ICML 2022 Workshop

Joel Oskarsson¹

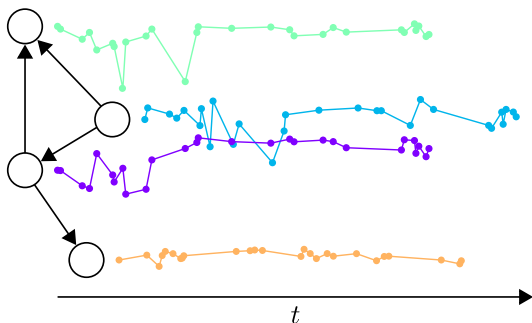
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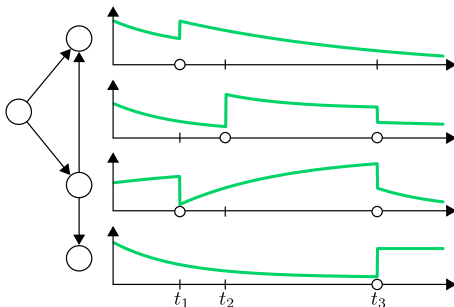
² Arriver Software AB

Modeling Irregular Graph-Structured Time Series



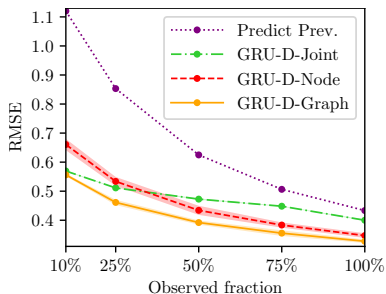
- One time series at each node
- Temporal graph neural networks
- Irregular observations
 - Irregular time-steps
 - Observing subset of nodes

Model with Time-Continuous Latent States



- Time-continuous latent state in each node
- Between observations: Exponential decay
- When observed: GRU-like update
- Graph neural networks in GRU-update and predictive model

Experiments on Traffic Data



- Predict next observed value at each node
- Time-continuous latent states + graph structure improves predictions

Links and Contact Information

Code available:

github.com/joeloskarsson/continuous-temporal-gnn



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