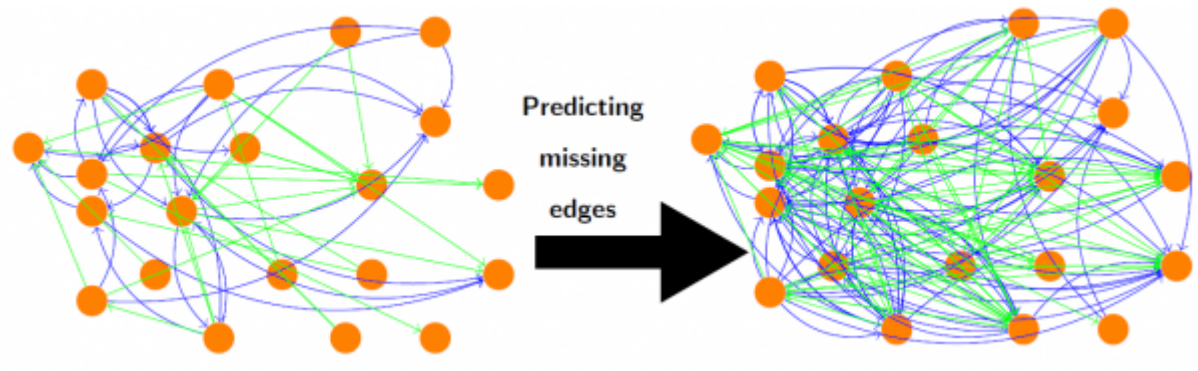
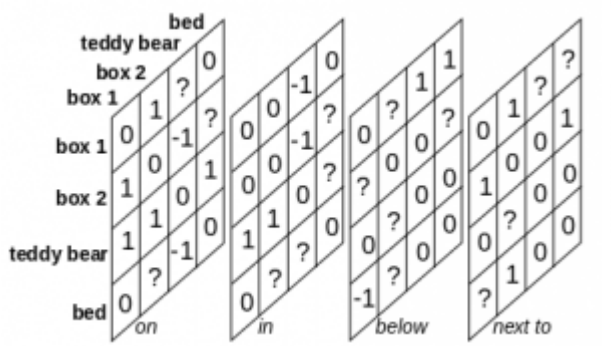
Innsbruck Object Relations Dataset

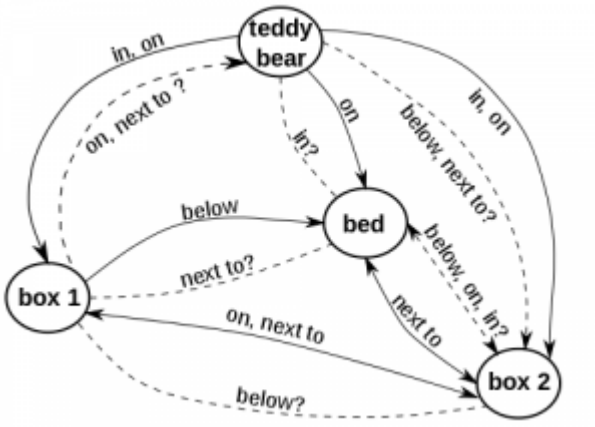
This dataset contains the set of possible object-object spatial relations. Learning object-object relations is a difficult problem with sparse, noisy, corrupted and incomplete information which makes it an interesting and challenging machine problem. We treated this problem as the learning missing edges in a multigraph problem.

Keywords: data inputation, matrix completion, low-rank



The learning scenario based on which this database was created is a toy clean-up task in a room of kids, where an agent needs to plan how to transform a messy child's room into a tidy one by moving objects to their storage locations and creating order. An agent can integrate knowledge on possible spatial relations of objects into the planning process and use it to renew the world model. Large numbers of objects and their potential interactions in this scenario make this task a large-scale problem. Estimating the missing relations based on those already known can accelerate planning procedures.





Dataset Features

- Dataset is generated based on the Princeton Shape Benchmark database
- Dataset contains 4 sets for the each possible connection between objects (*in*, *on*, *below* and *next to*). The problem is formulated that all possible relations should be treated so two objects can have mulitple connections.
- Links between objects are determined by values:
  - **0** - no connection
  - **1** - direct connection
  - **-1** - reverse connection
  - **empty** - unknown connection
- You can downlaoad dataset here

Reference

"*Learning missing edges via kernels in partially-known graphs*", Senka Krivic, Sandor Szedmak, Hanchen Xiong, Justus Piater, European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning 2015. PDF Please cite this paper if you are using this database.

BibTex @InProceedings{Krivic-2015-ESANN,

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title = {{Learning missing edges via kernels in partially-known graphs}},
author = {Krivi\'{c}, Senka and Szedmak, Sandor and Xiong, Hanchen and
Piater, Justus},
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Computational Intelligence and Machine Learning}},
year = 2015,
url = {https://iis.uibk.ac.at/public/papers/Krivic-2015-ESANN.pdf}
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