

# Knowledge Graph Completion With TransE vs Boltzmann Machines

## AUTHORS

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## AFFILIATIONS

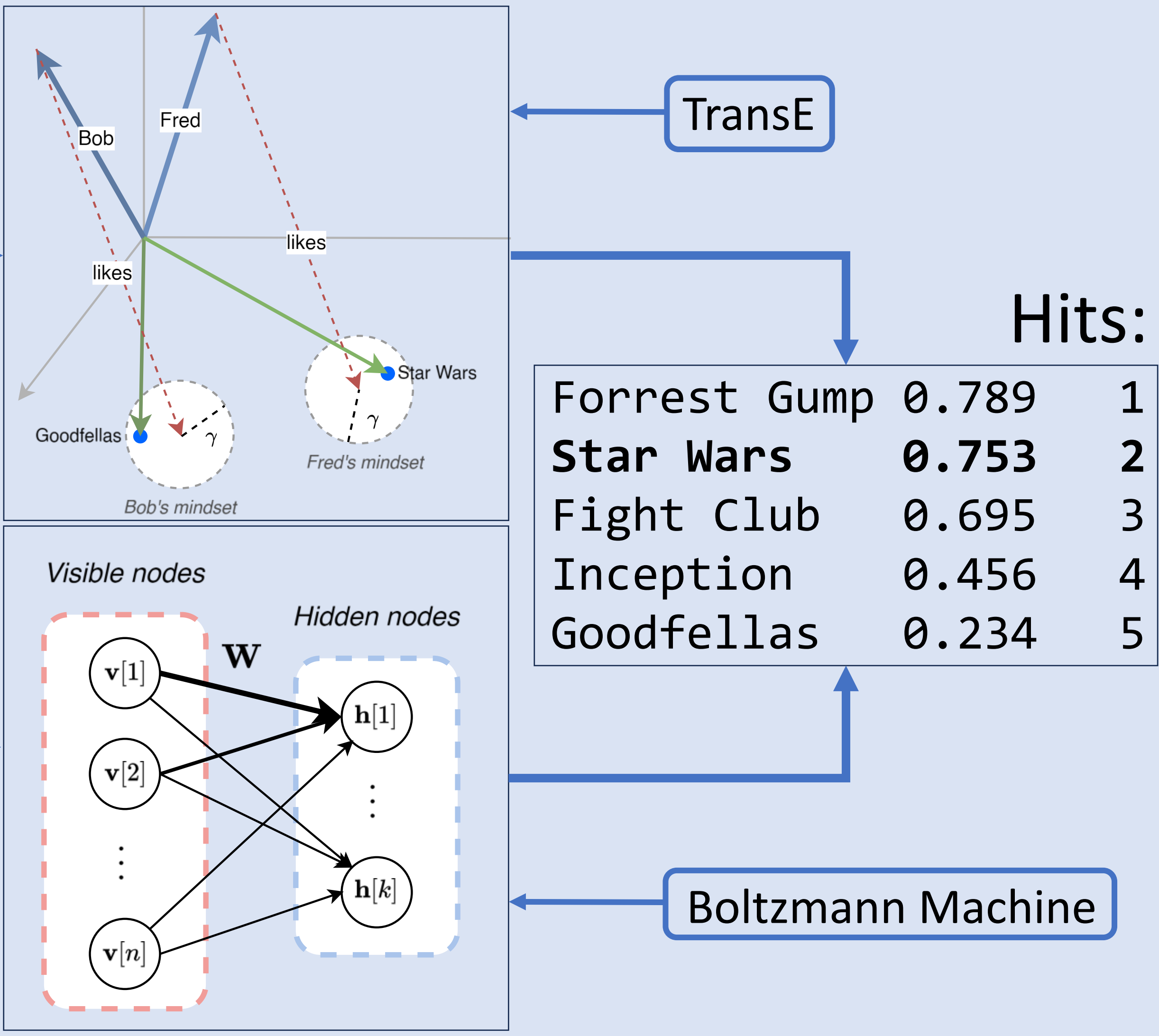
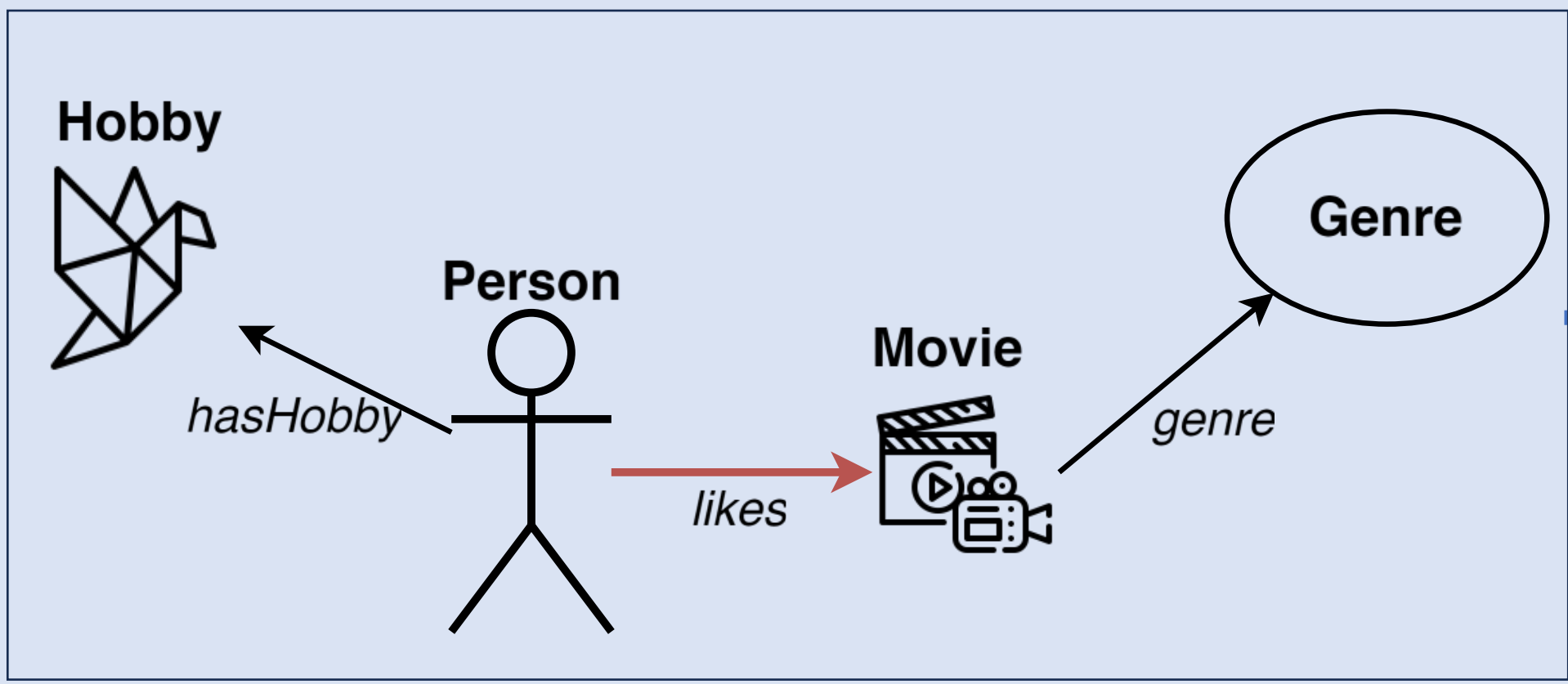
Technical University of Munich, TUM school of  
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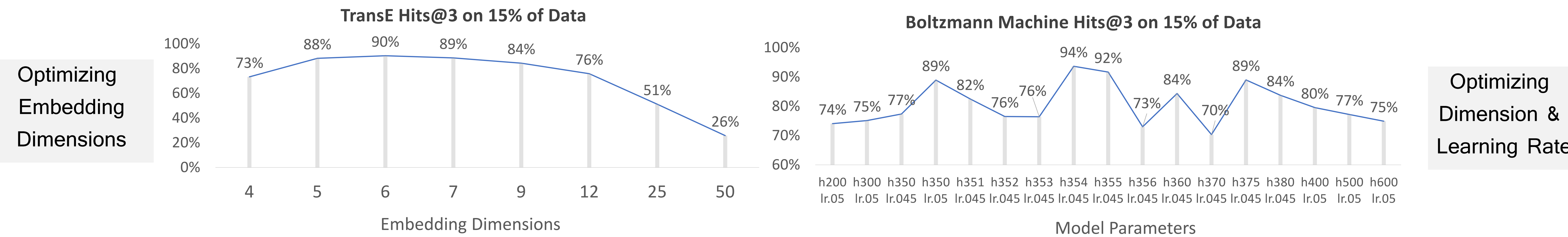
This project aims to explore ways to improve recommendation algorithms by using knowledge graph completion methods.

## Approach

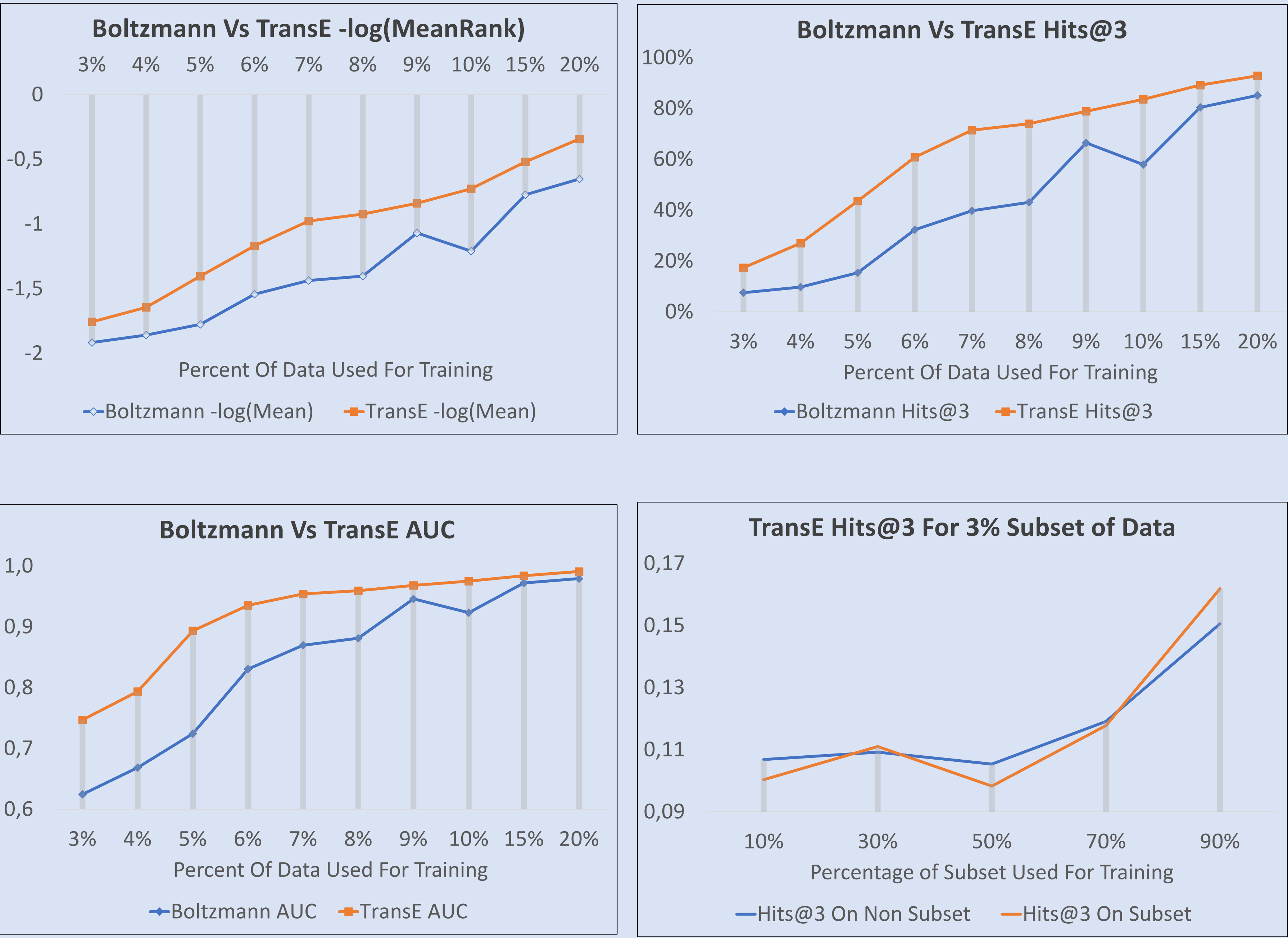
- Analyze and Split Data
- Train Models on Data
- Evaluate Models



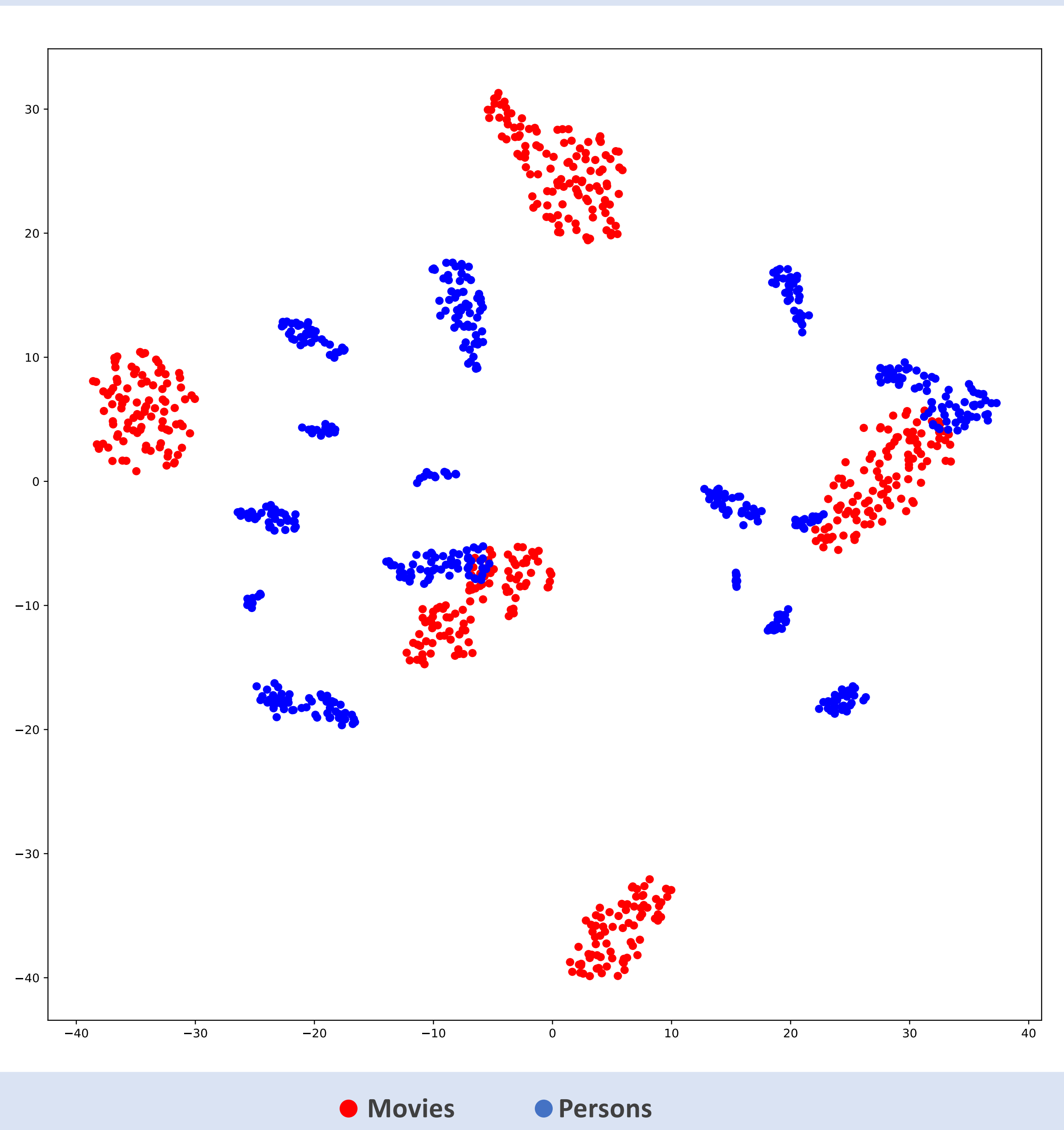
## Hyper-Parameter Tuning



## Results:



TransE embeddings of movies and persons



## Conclusion

- Training of TransE was far easier to handle and we were able to get it to perform better than Boltzmann
- With 9% of the original dataset, TransE can recreate it with 95% AUC score and 79% Hits@3

## Future Work

We would attempt to improve the Boltzmann machine further to see if it could outperform TransE with more modifications

## References

- R. Salakhutdinov, A. Mnih, and G. Hinton, "Restricted Boltzmann machines for collaborative filtering," in Proceedings of the 24th International Conference on Machine Learning, 2007, pp. 791-798. doi: 10.1145/1273496.1273596.
- A. Bordes, N. Usunier, A. Garcia-Duran, J. Weston, and O. Yakhnenko, "Translating Embeddings for Modeling Multi-relational Data," in Advances in Neural Information Processing Systems, 2013, vol. 26. [Online]. Available: [https://proceedings.neurips.cc/paper\\_files/paper/2013/file/1cecc7a77928ca8133fa24680a88d2f9-Paper.pdf](https://proceedings.neurips.cc/paper_files/paper/2013/file/1cecc7a77928ca8133fa24680a88d2f9-Paper.pdf)