# Knowledge Graph Completion With TransE vs Boltzmann Machines

AUTHORS

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#### **AFFILIATIONS**

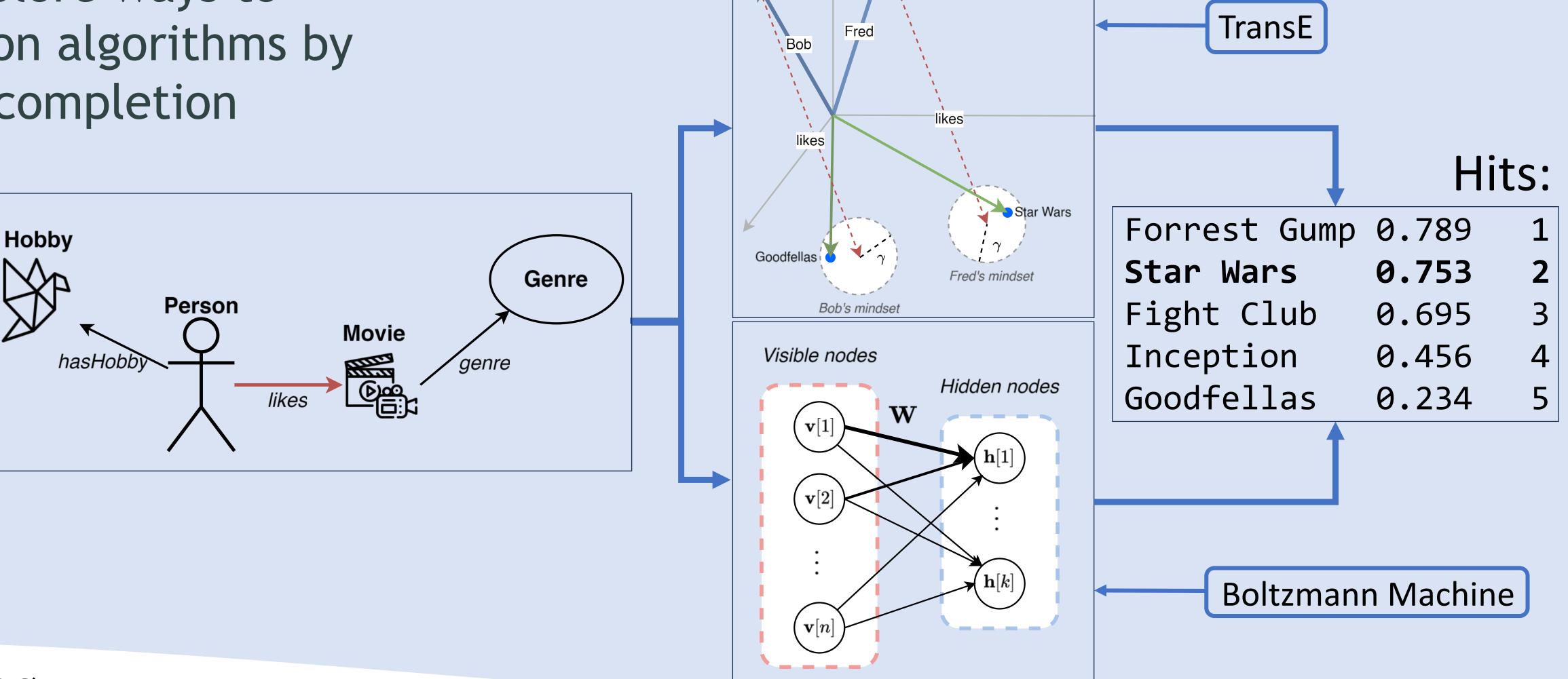
Technical University of Munich, TUM school of Computation, Information and Technology Bachelor Practical course in Data Engineering

Advisor: M.Sc. Tim Schwabe

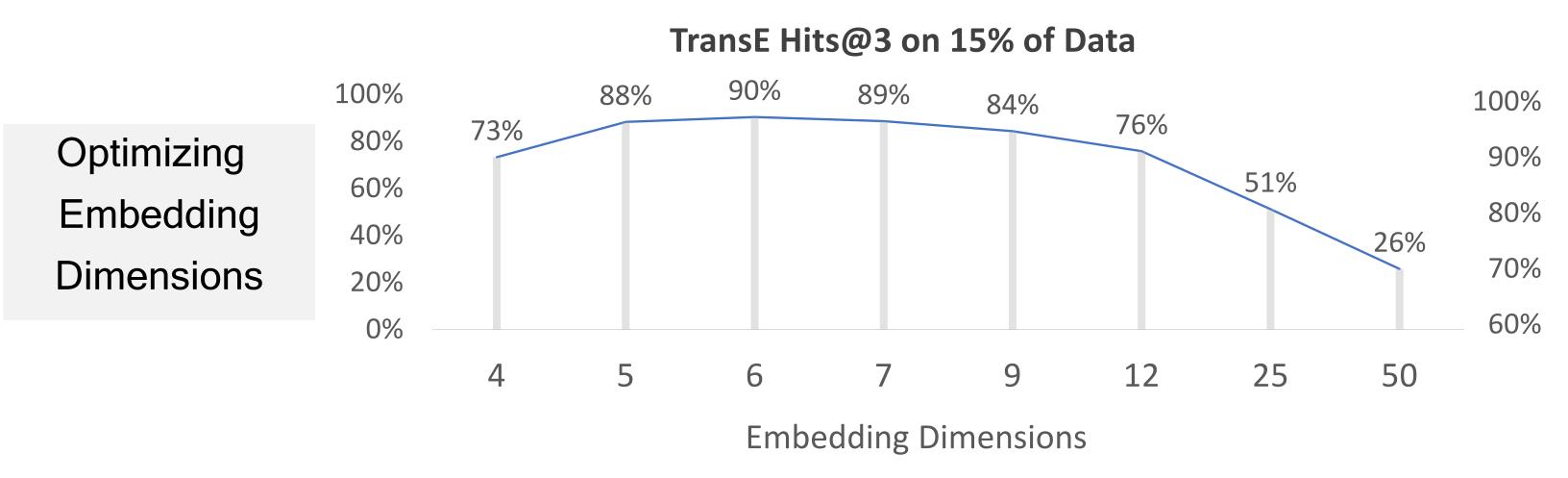
This project aims to explore ways to improve recommendation algorithms by using knowledge graph completion methods.

### Approach

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



### Hyper-Parameter Tuning

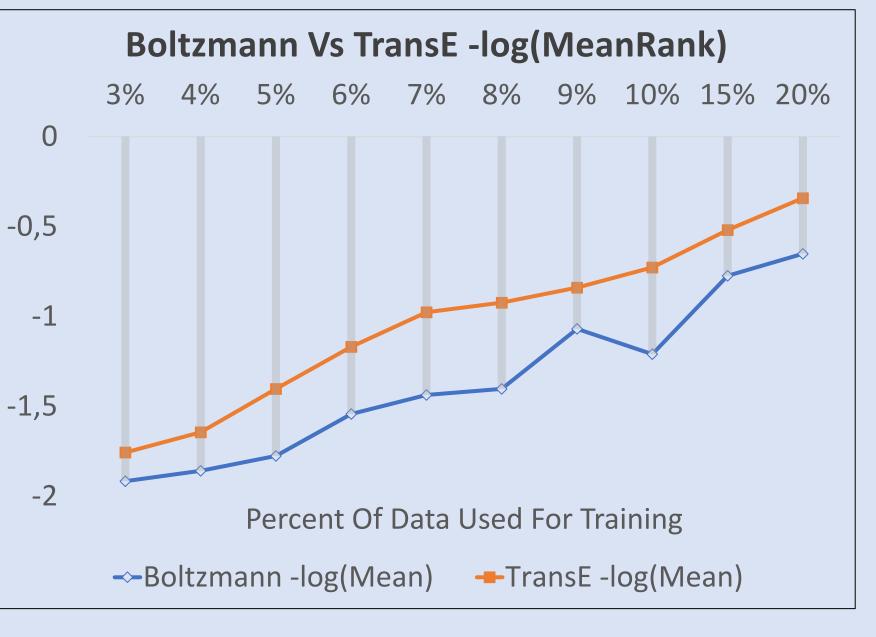


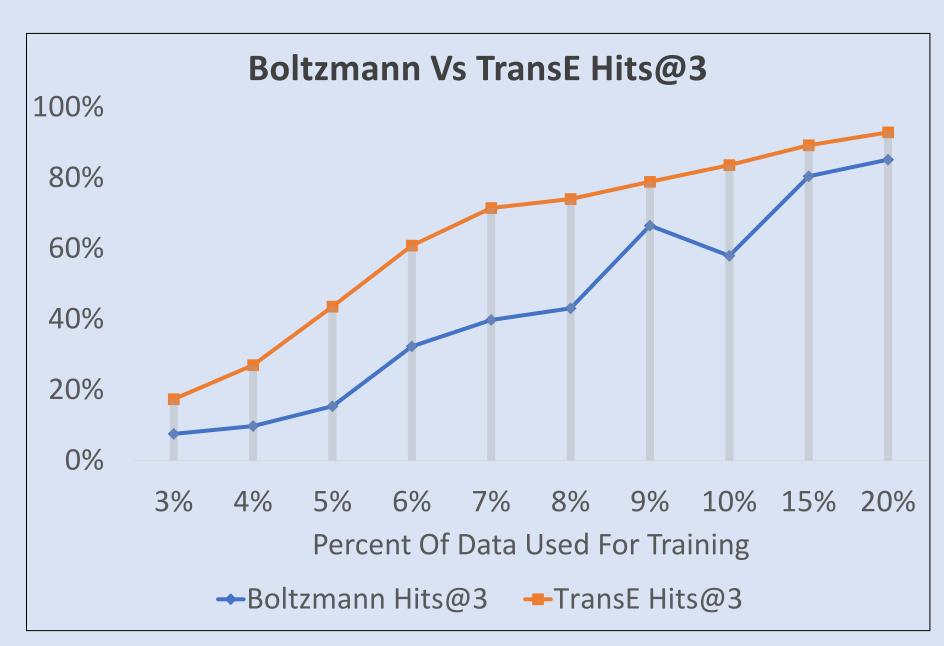
#### Boltzmann Machine Hits@3 on 15% of Data 94% 92% 89% 89% 84% 84% 76% 80% 77% 75% 74% 75% 77% h200 h300 h350 h350 h351 h352 h353 h354 h355 h356 h360 h370 h375 h380 h400 h500 h600 lr.05 lr.05 lr.045 lr.05 lr.05

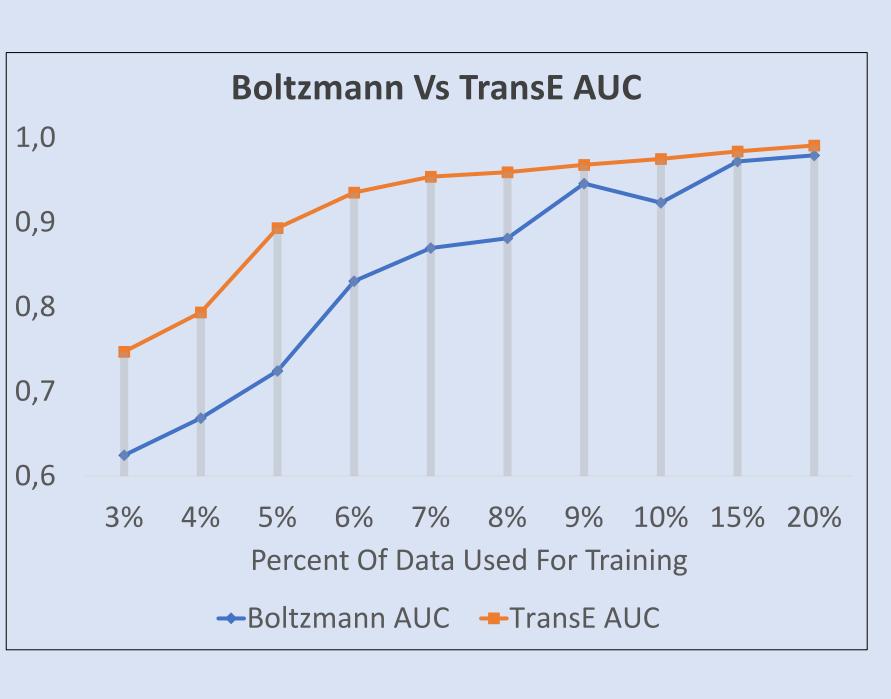
**Model Parameters** 

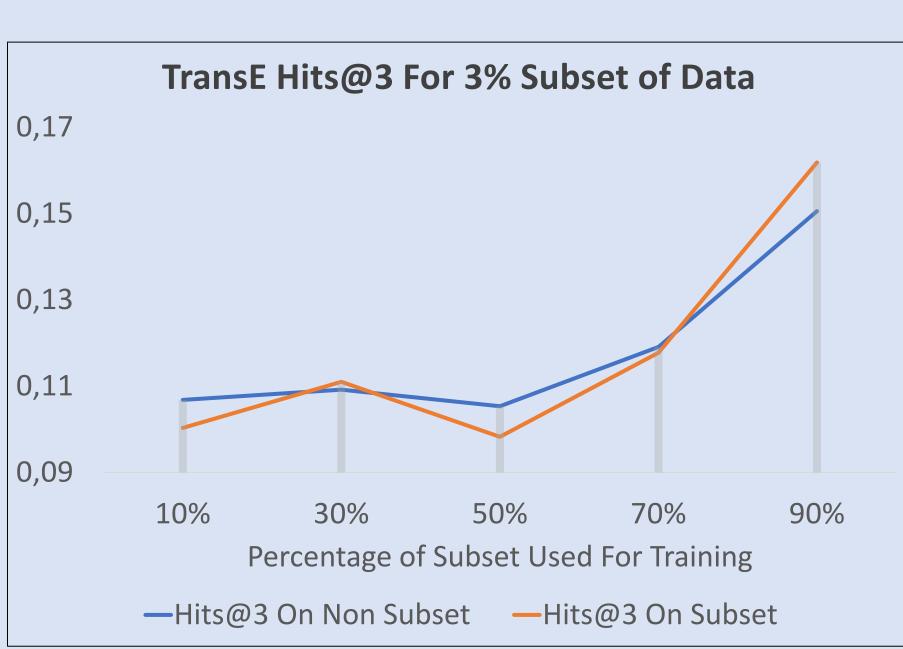
### **Optimizing** Dimension & Learning Rate

## Results:

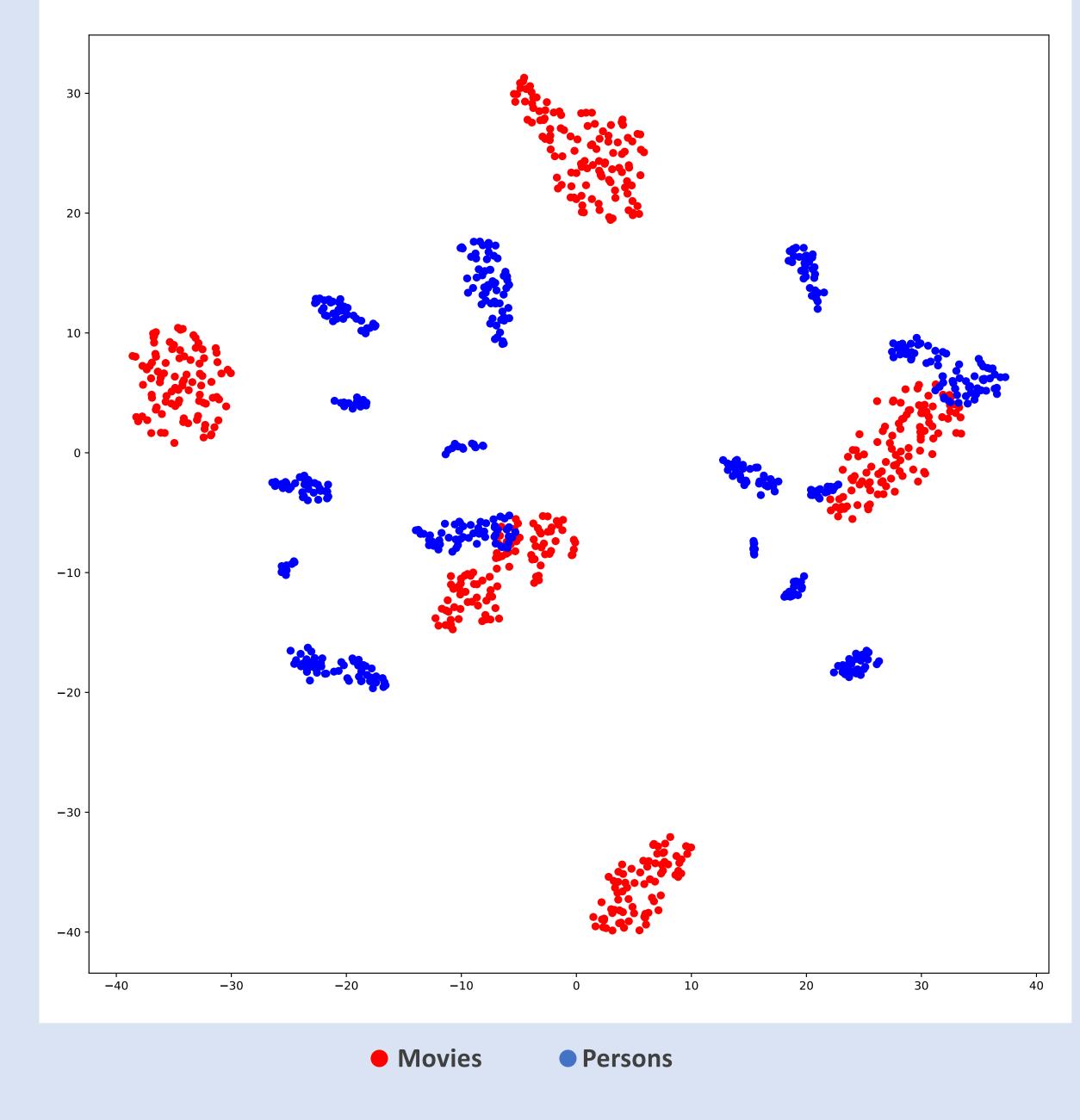












### Conclusion

#### 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