Making Matches – Recommending the right Personalities

Current Tpoics in Web Applications, Information Management and Semantics
Summer Term 2018

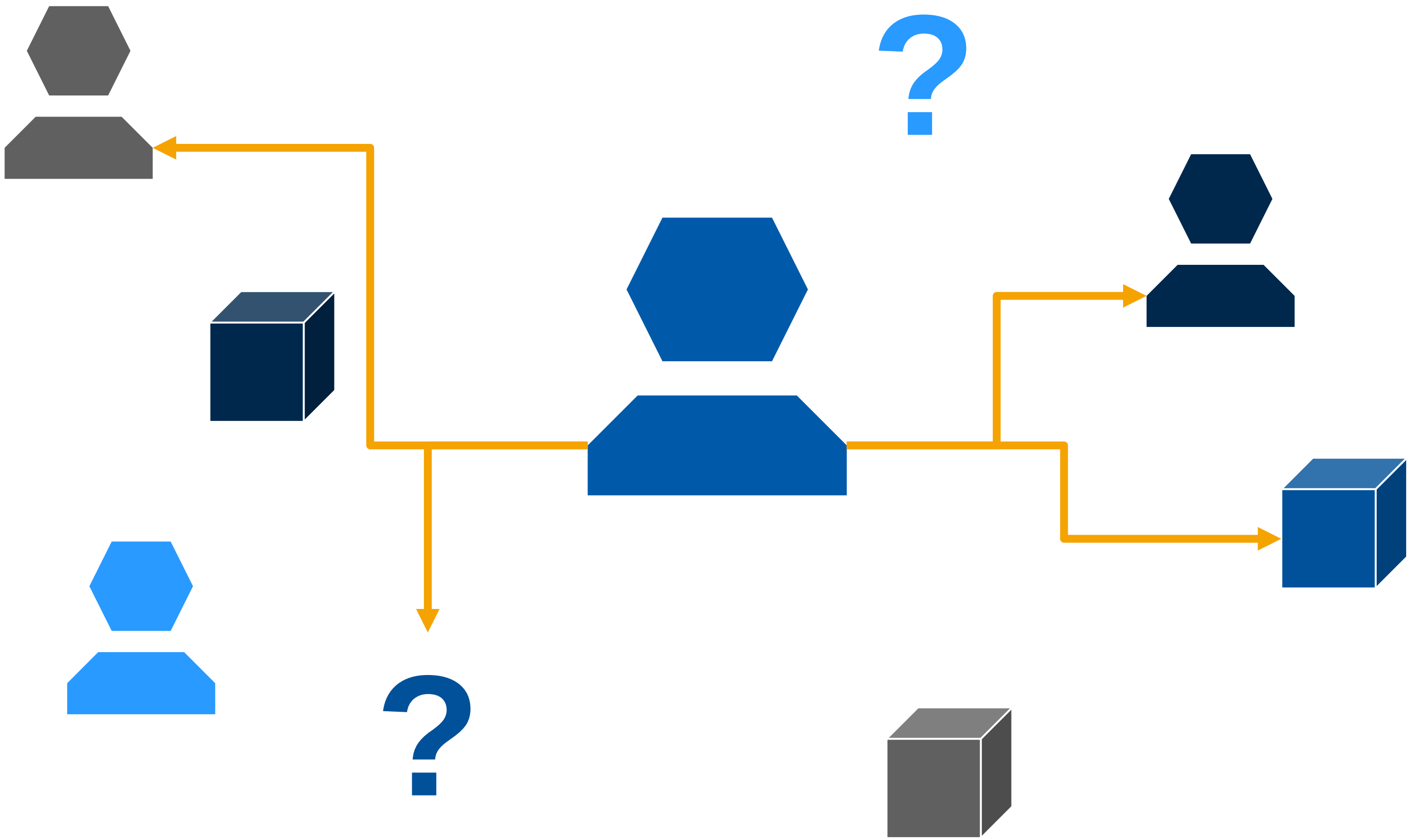
KOM - Multimedia Communications Lab
Prof. Dr.-Ing. Ralf Steinmetz (Director)
Dept. of Electrical Engineering and Information Technology
Dept. of Computer Science (adjunct Professor)
TUD – Technische Universität Darmstadt
Merckstr. 25, D-64283 Darmstadt, Germany
Tel.+49 6151 166150, Fax. +49 6151 166152
www.KOM.tu-darmstadt.de

Presented by: Paul Schweiger

Paul.schweiger@stud.tu-darmstadt.de

Introduction

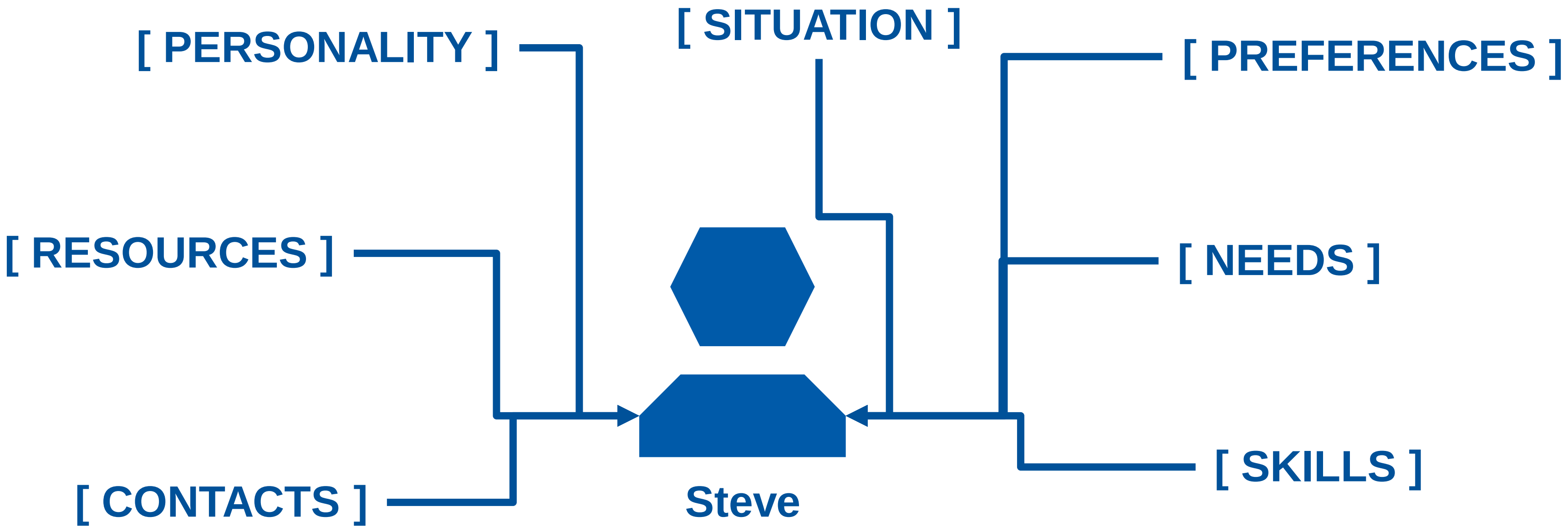
Recommender Systems help people to engage in meaningful ways



Core Concepts: User Modeling

User Modeling

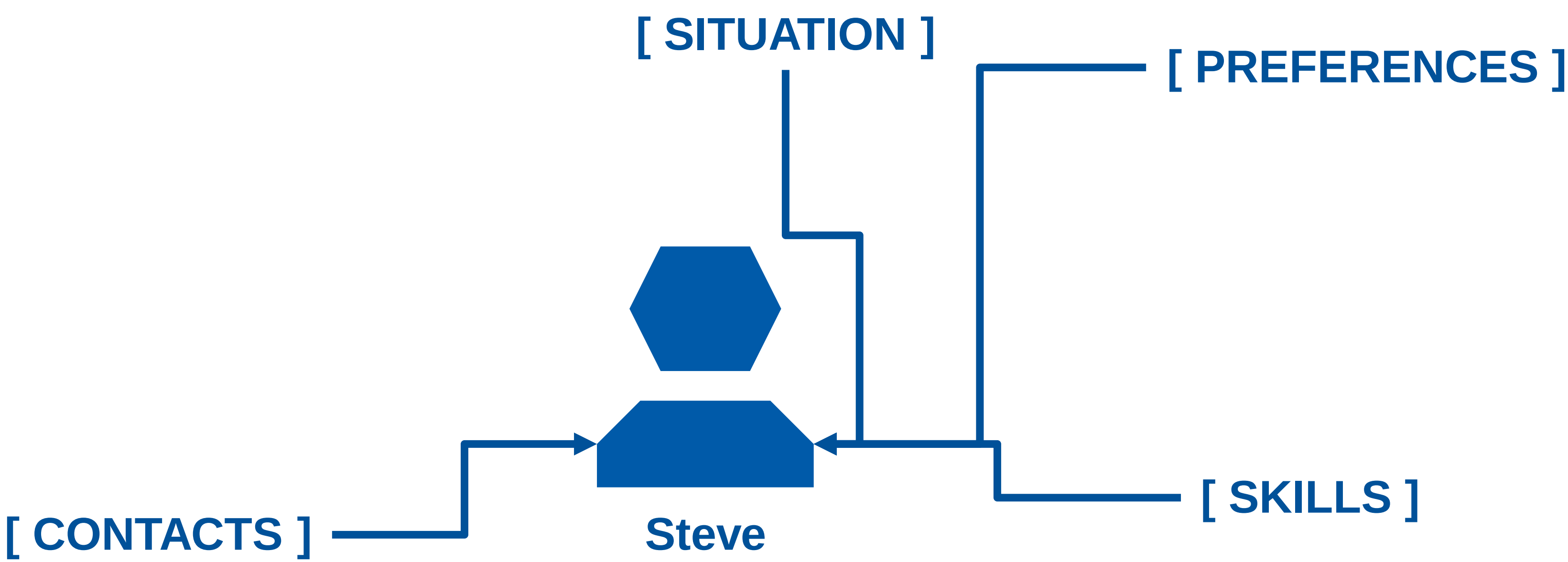
- Recommendations have to be adjusted for an individual user
- User Models encompass everything we deem relevant about our user



Core Concepts: User Modeling

User Modeling

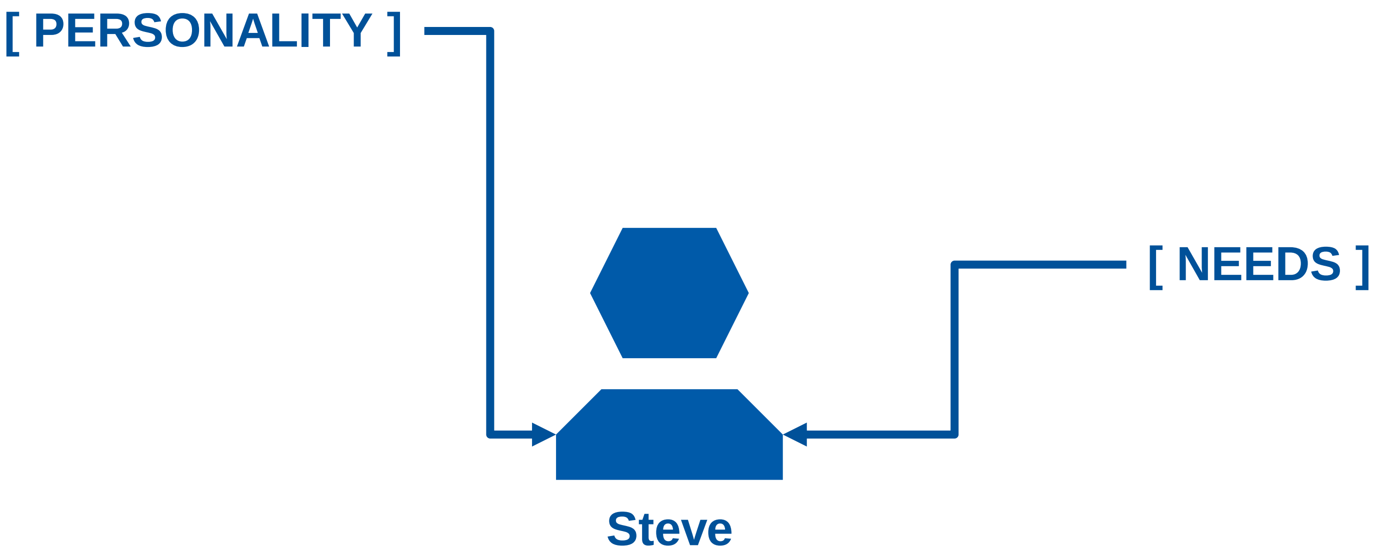
- Recommendations have to be adjusted for an individual user
- User Models encompass everything we deem relevant about our user



Core Concepts: User Modeling

User Modeling

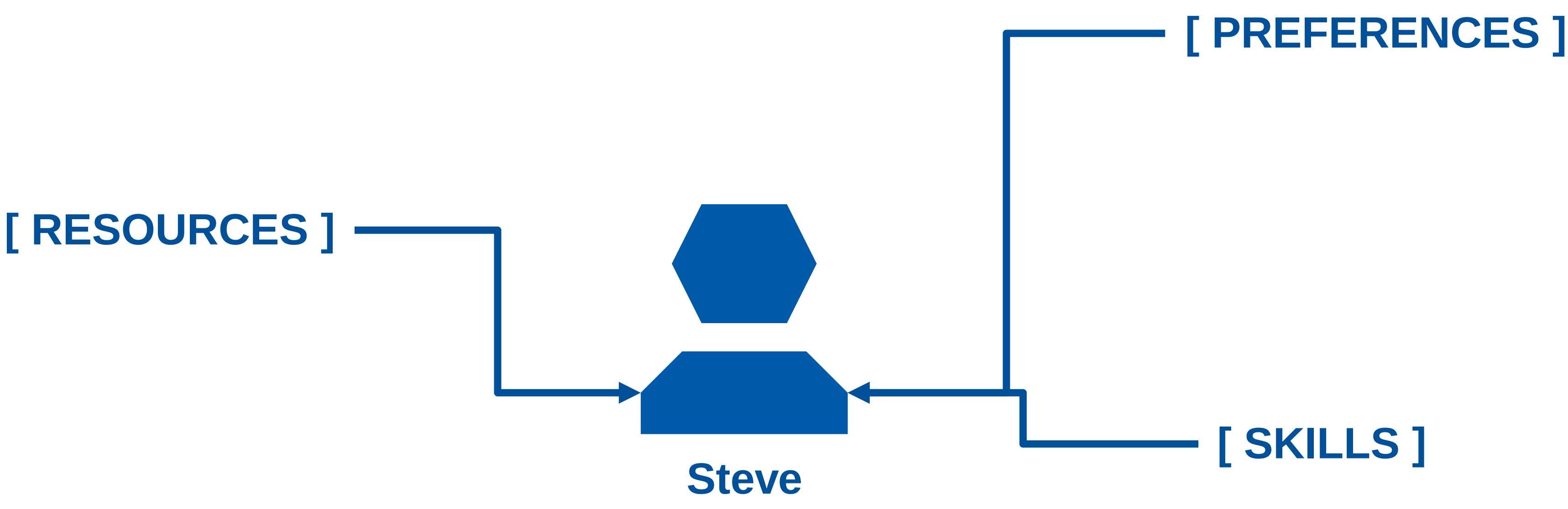
- Recommendations have to be adjusted for an individual user
- User Models encompass everything we deem relevant about our user



Core Concepts: User Modeling

User Modeling

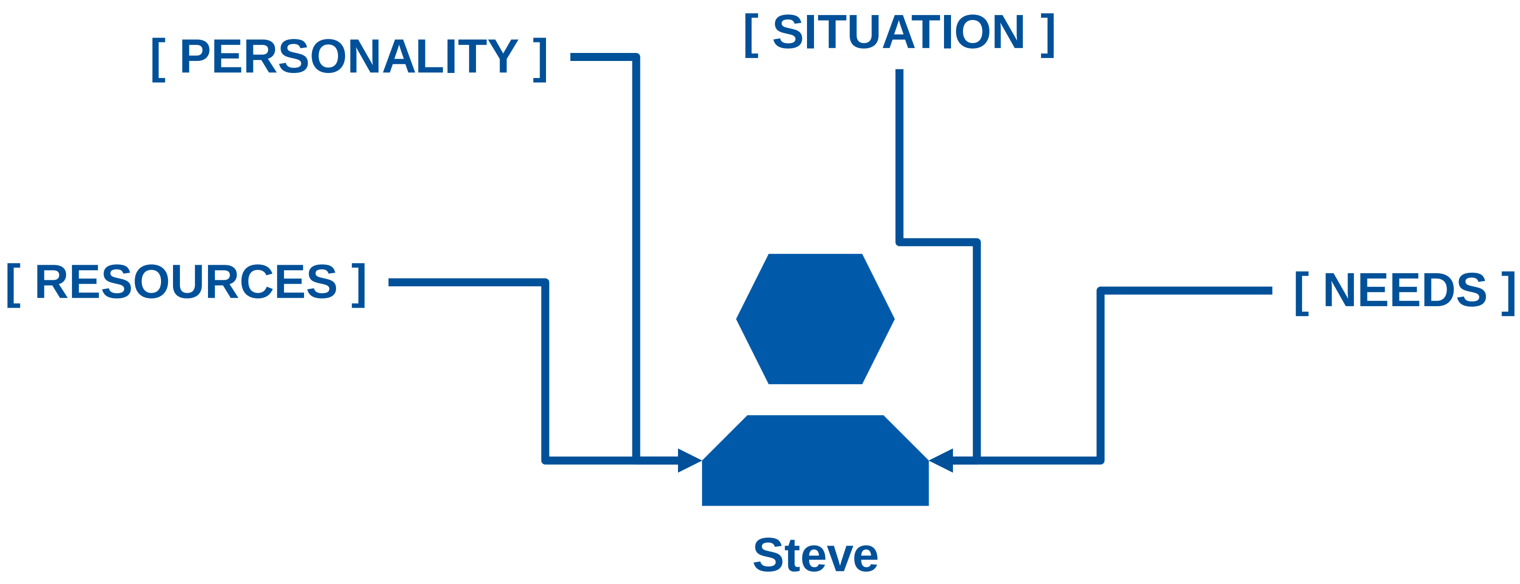
- Recommendations have to be adjusted for an individual user
- User Models encompass everything we deem relevant about our user



Core Concepts: User Modeling

User Modeling

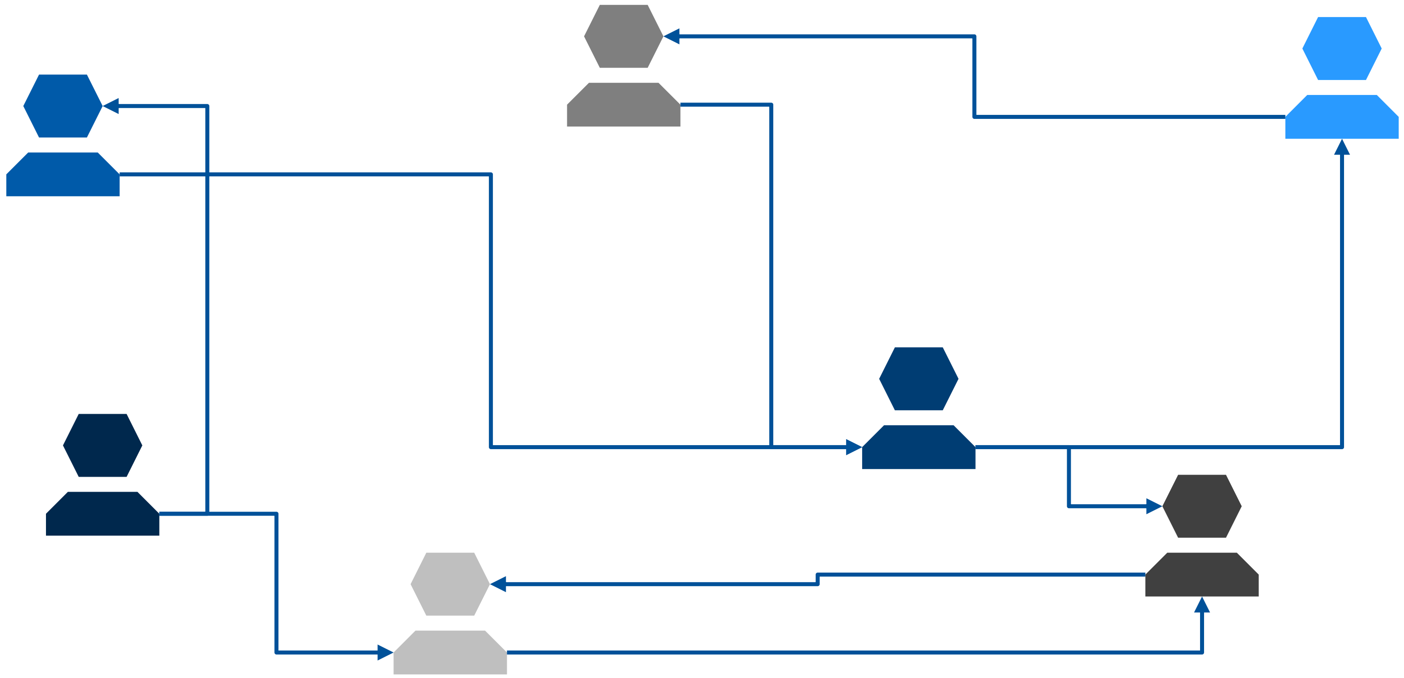
- Recommendations have to be adjusted for an individual user
- User Models encompass everything we deem relevant about our user



Core Concepts: Reciprocal Recommendations

Reciprocal Recommendations

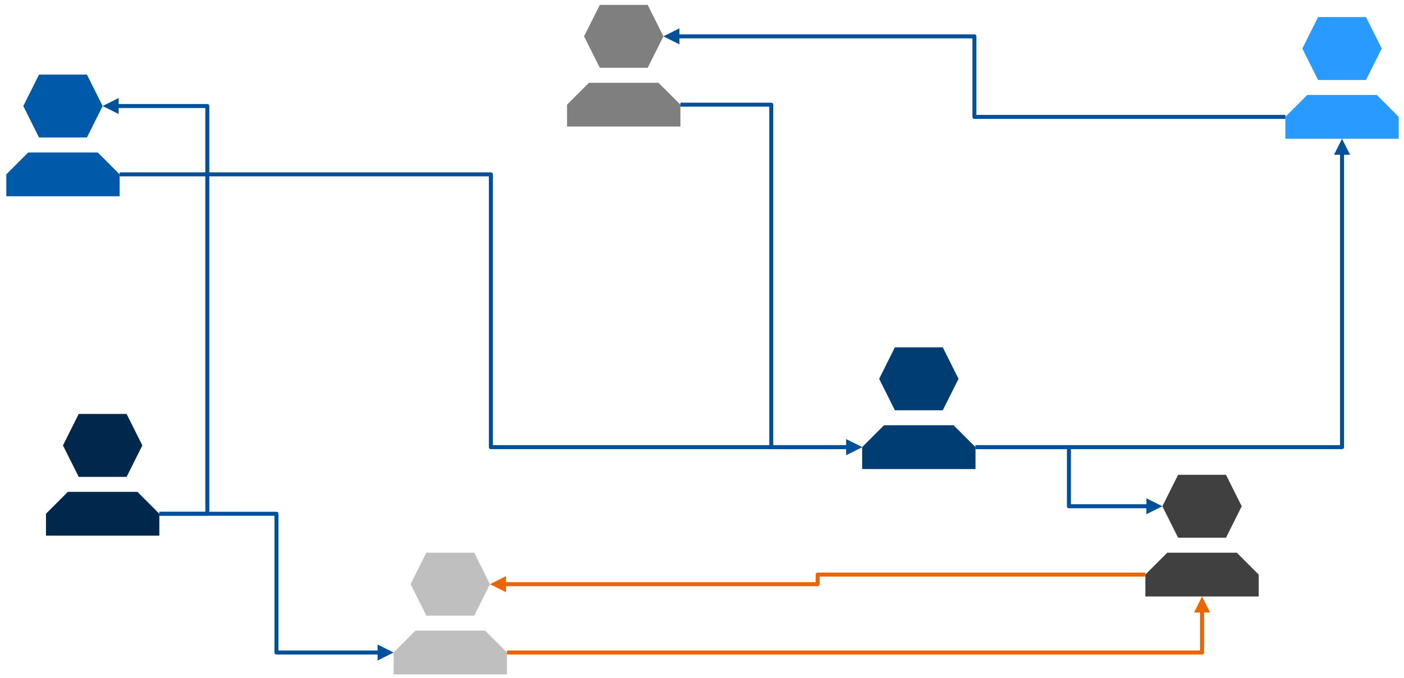
- Users receive users as recommendations and is in turn a recommended item
- Truly reciprocal when a user is recommended to his own recommended users
- Online dating, gaming matchmaking, social networks, group formation, …



What is this talk about?

Reciprocal Recommendations

- Users receive users as recommendations and is in turn a recommended item
- Truly reciprocal when a user is recommended to his own recommended users
- Online dating, gaming matchmaking, social networks, group formation, …



Reciprocal Peer Recommendation for Learning Purposes

System

- adaptive, web-based, student-facing, multi-purpose learning platform
- Classical e-learning platform capabilities and recommendation of learning capabilities
- RiPPLE -> „Recommendation in Personalized Peer Learning Environments“

User Model

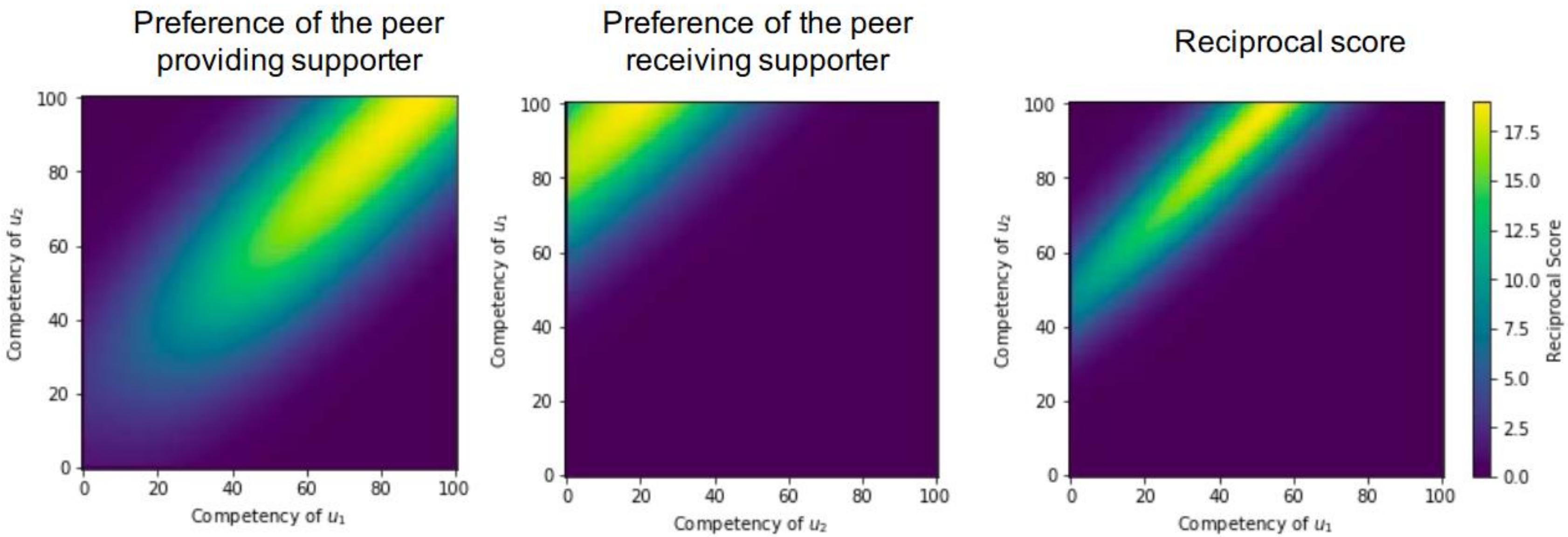
- Topic-wise competency (derived from e-learning results)
- Available timeslots
- Roles: Topics in which a user would like to
  - Find a learning partner
  - Receive peer support
  - Give peer support
- Preferences regarding competency differences for each role

Combine user‘s learning needs and capabilitiies

Reciprocal Peer Recommendation for Learning Purposes

Recommendations

- If their timeslots and roles are compatible, calculate two one-directional scores for every pair of users
- Calculate the harmonic mean of these two values, leading to a reciprocal, symmetric score for each match
- Return a list of k recommendations to each user



Reciprocal Peer Recommendation for Learning Purposes

TECHNISCHE UNIVERSITÄT DARMSTADT

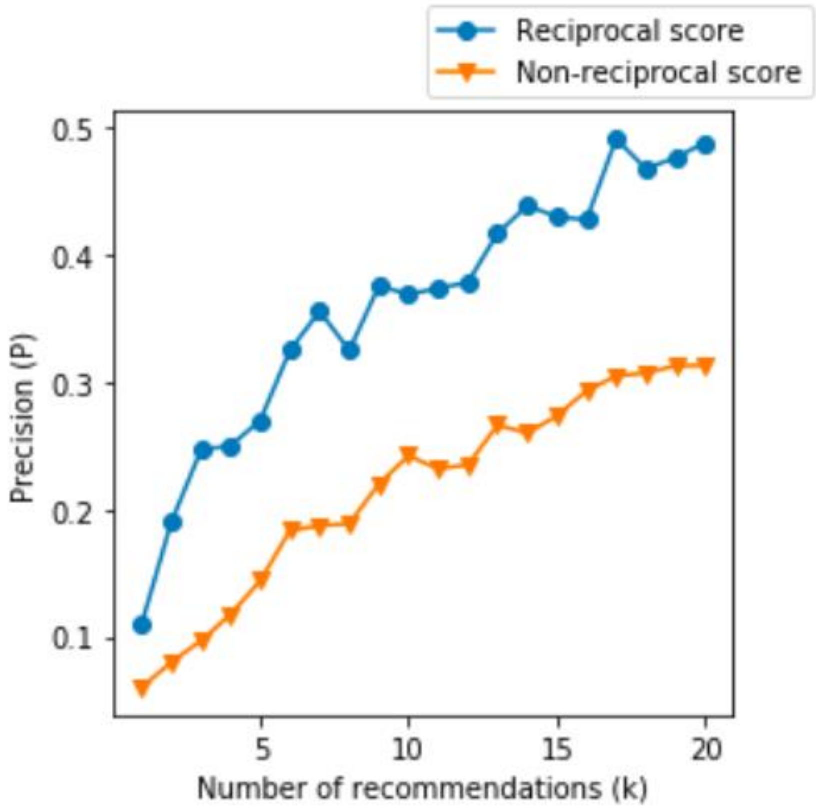
Evaluation

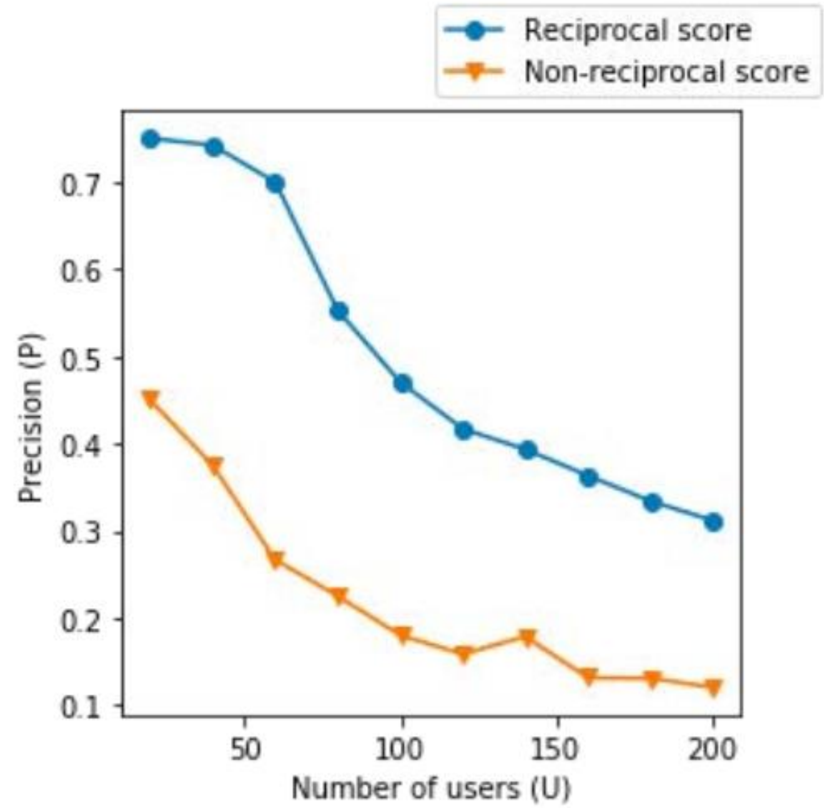
- Completely artificial data
- Main question: How would the system perform in real life?
- Quality metrics:
  - **Scalability**
  - **Reciprocality**
  - **Coverage**
  - **Quality**
- No specific goals set

Future Plans

- Practical evaluation in college courses during 2018

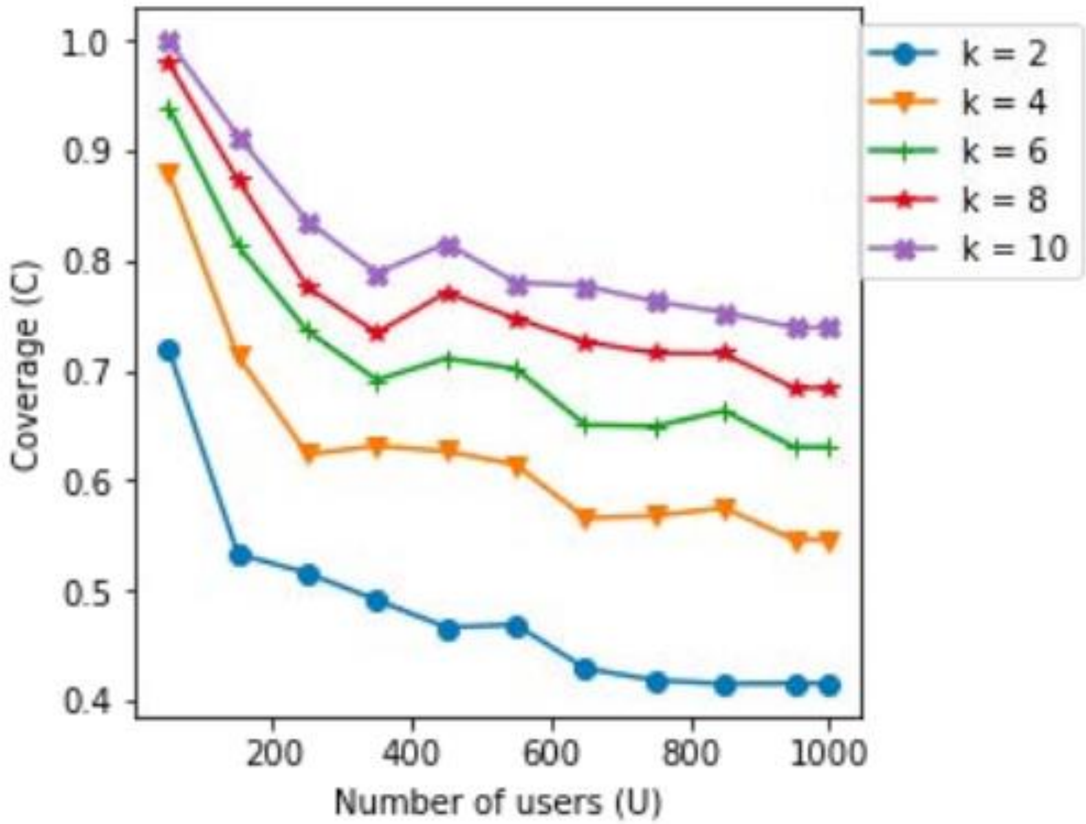
Reciprocality





Coverage

TECHNISCHE
UNIVERSITÄT
DARMSTADT



Discussion

RiPPLE‘s shortcomings

- No consideration of abandoned users
- No learning groups, only pairing
- How would users know their competency difference preferences?

User Modeling

- Especially important in reciprocal scenarios, where users are items
- Overspecification leads to random recommendations
- Data Collection Problems [See next slide]

Discussion – Data Collection Problems

TECHNISCHE UNIVERSITÄT DARMSTADT

Explicit user data

- Self-reported by users about themselves (e.g. feedback, ratings, …)
- biased by inability to properly report information
  - Source: Dude, trust me. [Doing my Masters in Psychology in IT]
- Psychology was founded to collect information about people, e.g. via tests

Implicit user data

- Online data collected during usage
- Cold start problem: Users would have to be randomly assigned at first
- Operationalization problems:
  - How do we measure „fun“ in games? How do we measure sympathy between users?
  - Source: Dude, trust me.

Summary

TECHNISCHE UNIVERSITÄT DARMSTADT

User Modeling

- Highly important to be able to properly recommend items
- Depending on many different factors
- Data can be hard to acquire

Reciprocal Recommendations

- Valuable mechanism to help people find meaningful engagements
- Ensure benefits for all participants

References

TECHNISCHE UNIVERSITÄT DARMSTADT

- Potts, B. A., Khosravi, H., Reidsema, C., Bakharia, A., Belonogoff, M., & Fleming, M. (2018, March). Reciprocal peer recommendation for learning purposes. In *Proceedings of the 8th International Conference on Learning Analytics and Knowledge* (pp. 226-235). ACM.
- Aaaand lots more, found in the paper. Seriously, I couldn‘t list them here.