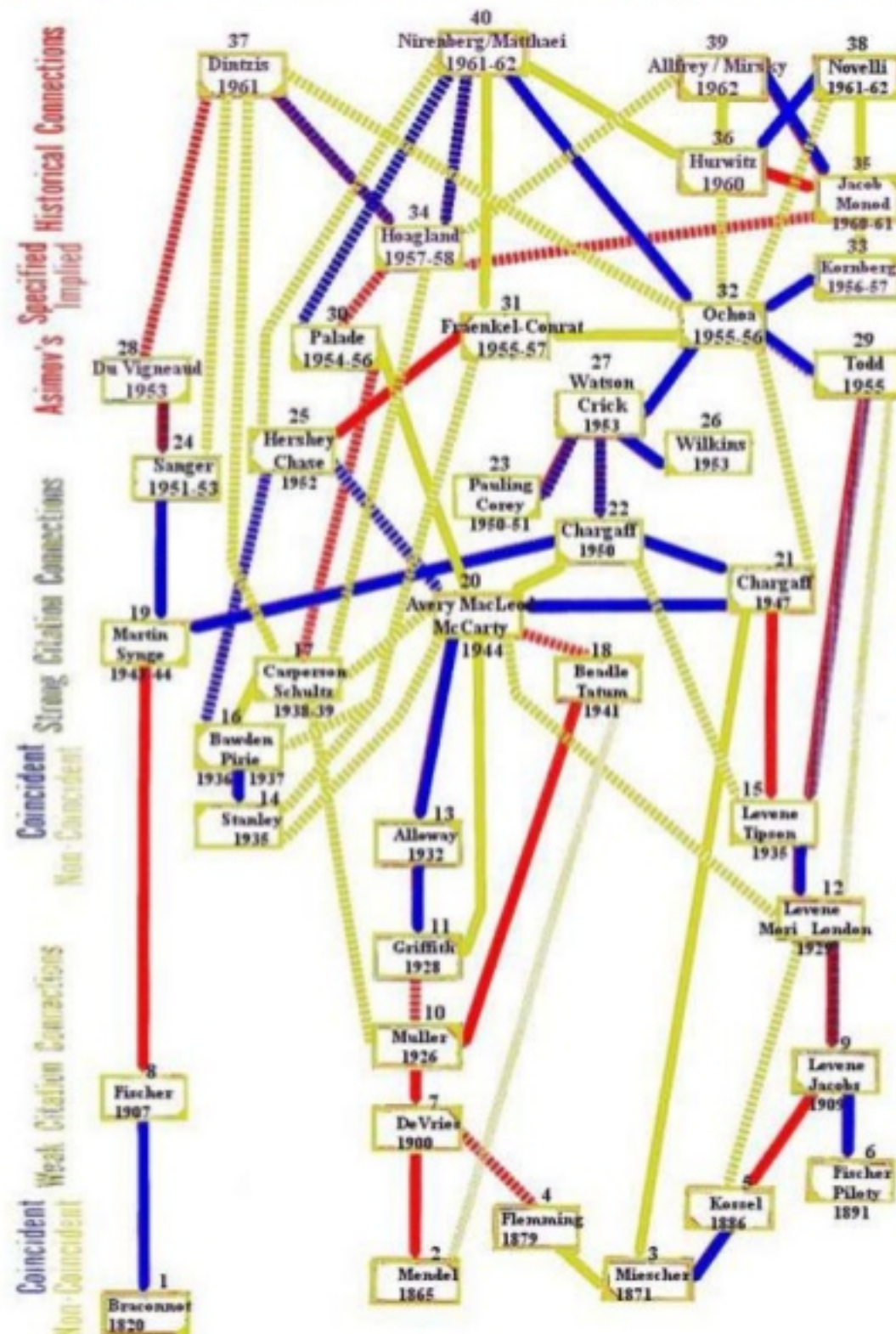




Altmetrics-based Visualizations Depicting the Evolution of a Knowledge Domain

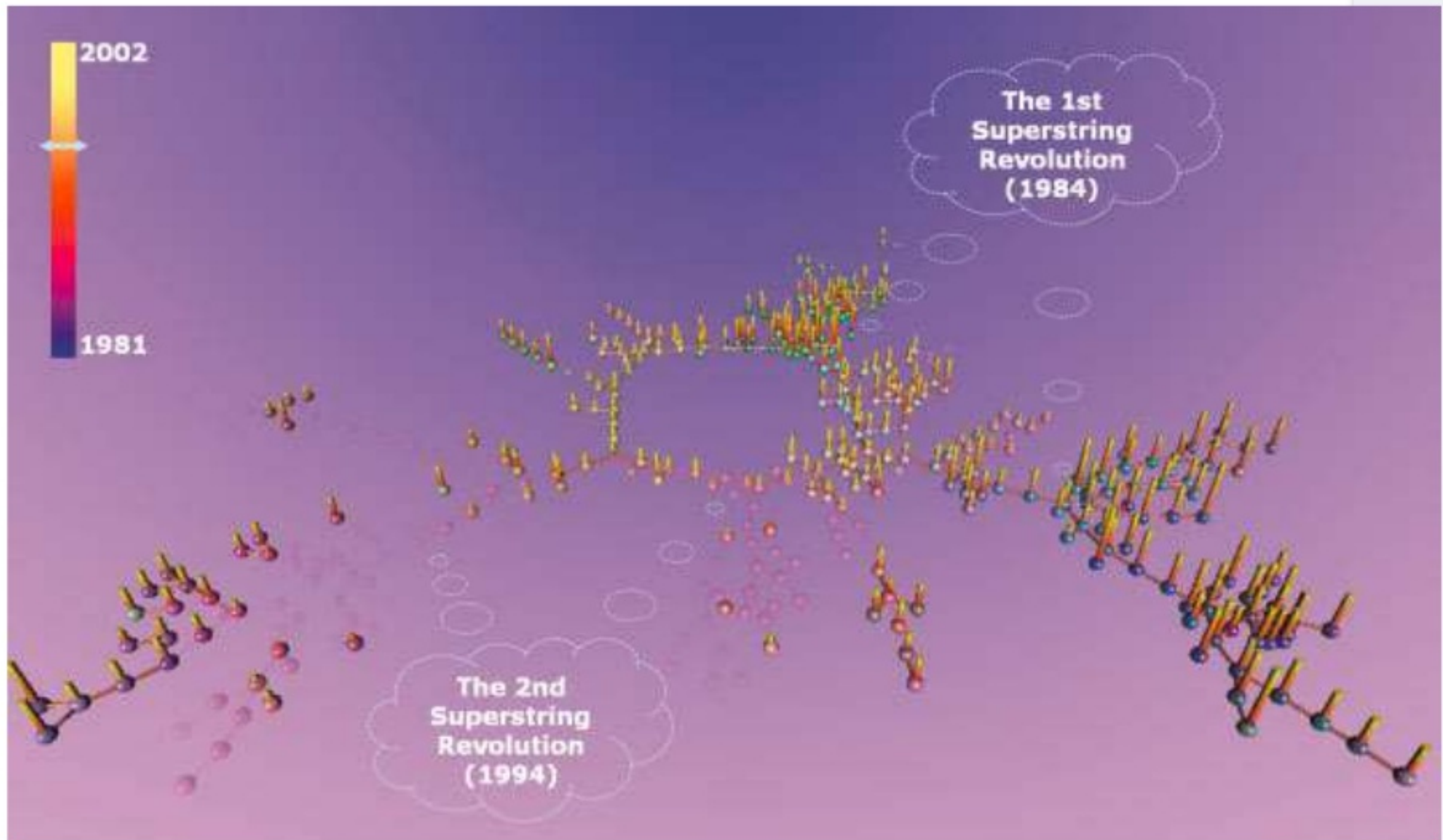
Peter Kraker (Know-Center)
Philipp Weißensteiner (TU Graz)
**Peter Brusilovsky (University of
Pittsburgh)**

Evolution of a Knowledge Domain



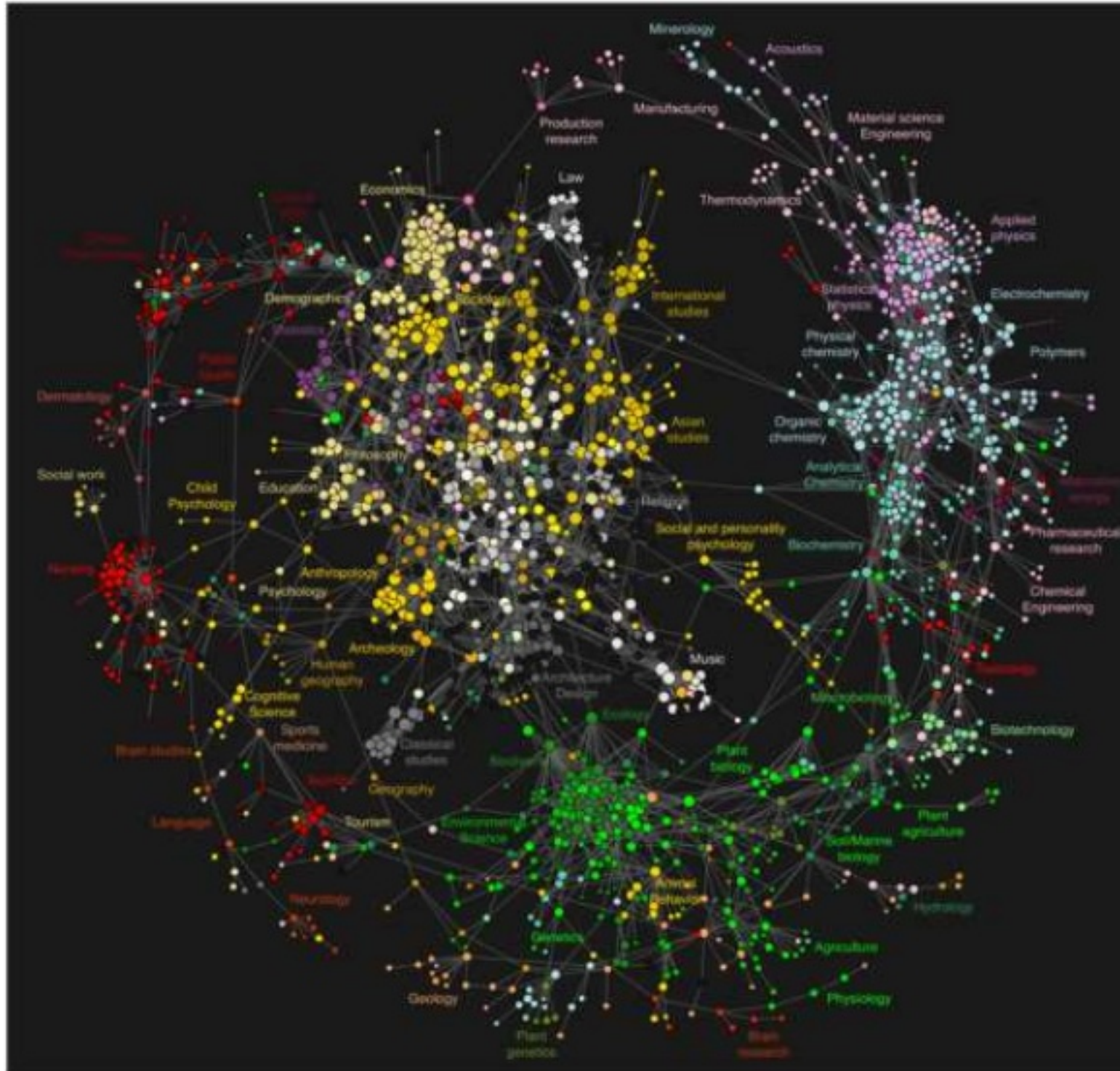
Introduction

Evolution of a Knowledge Domain



Chen and Kuljis (2003)

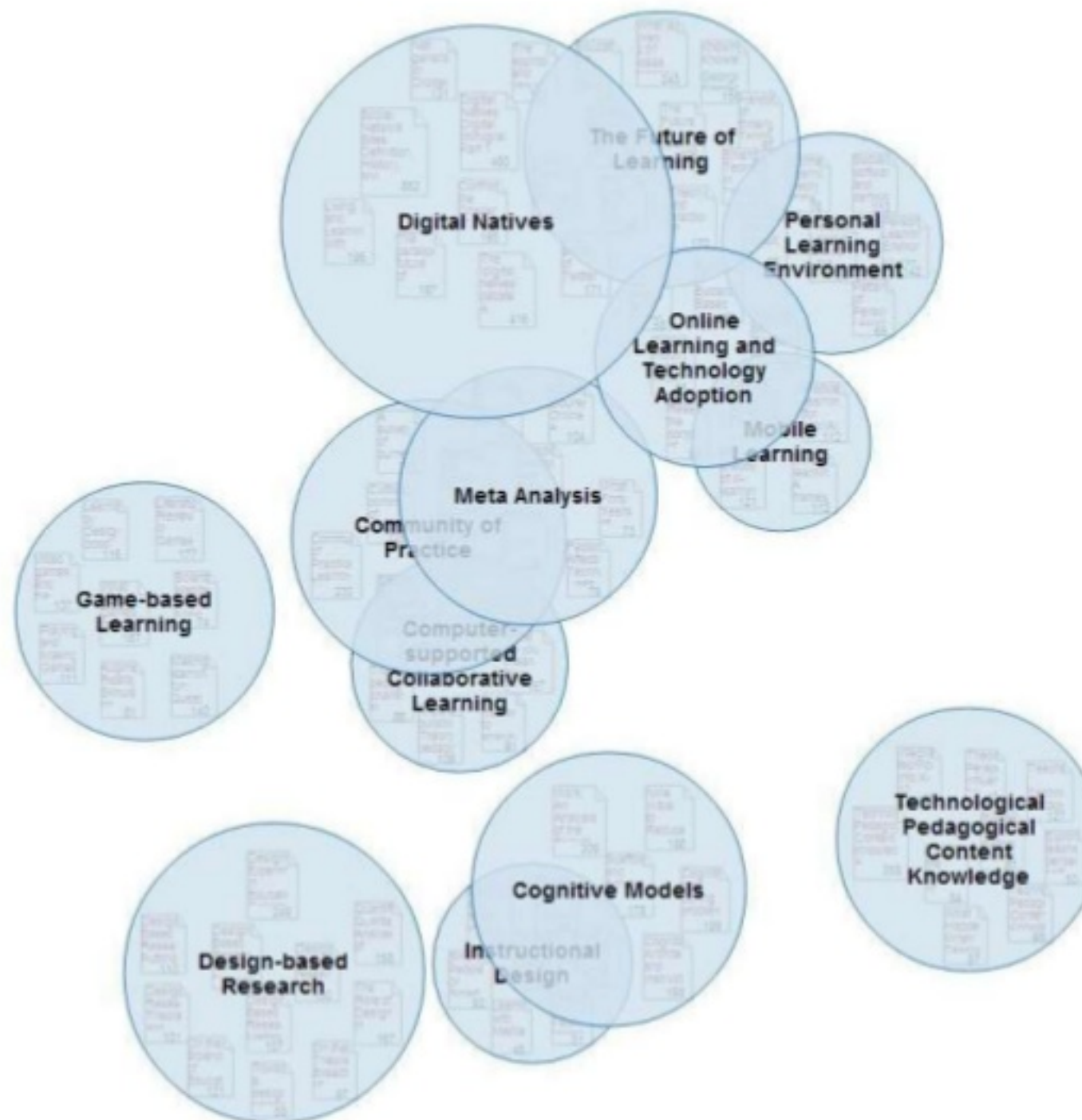
Altmetrics-based Visualizations



Bollen et al.⁴
(2009)

Introduction

Altmetrics-based Visualizations



Introduction

Approach

Knowledge domain: scientific conferences

Research Questions

- How to automatically determine the intellectual structure of a scientific conference?
- How to visualize the evolution of this intellectual structure?
- How to design the visualization so that it facilitates unsupervised exploration?

Base: scheduling data in Conference Navigator (Parra et al. 2012)

Use Case: 19th and 20th Conference on User Modelling, Adaptation and Personalization

Article metadata and co-bookmarking data

UMAP 2012

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Rating Prediction Using Preference Relations Based Matrix Factorization

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Authors: Maunendra Sankar Desarkar [Sudeepna Sarkar](#)

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Track: FactMod-2012

Scheduled: 2012-07-17 09:00-09:45

Room: SH3420 @UQAM

DOI: [10.1145/factmod2012_paper_3.pdf](#)

Abstract: Rating prediction is an important problem for rating based recommender systems. In Rating Prediction, the task is to predict the rating that a user would give to an item that he/she has not rated in the past. Most of the existing algorithms for the task concentrate on the absolute ratings given to different items by different users in the past. However, there are few recent research work that point out some drawbacks of absolute rating based systems and algorithms, and suggest the use of preference relations between pair of items to capture the users' interests about the items. In this paper, we propose a rating prediction algorithm that considers the relative ratings given by users for different pairs of items. The algorithm models the users and items using a matrix factorization framework. The learned model of users and items are first used to predict the personalized utility of an item for a user. This utility is then converted to a valid rating value in a predefined rating scale by employing a 'lemph(personalized scaling). Experimental evaluation on a benchmark dataset reveals that better prediction accuracies may be achieved by modeling the users and items using relative rating information.

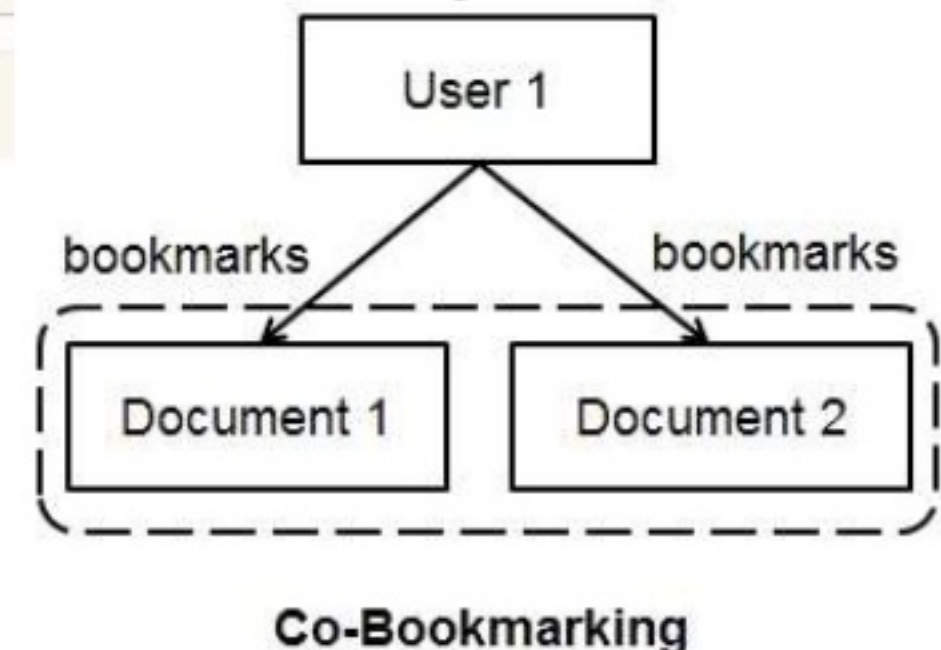
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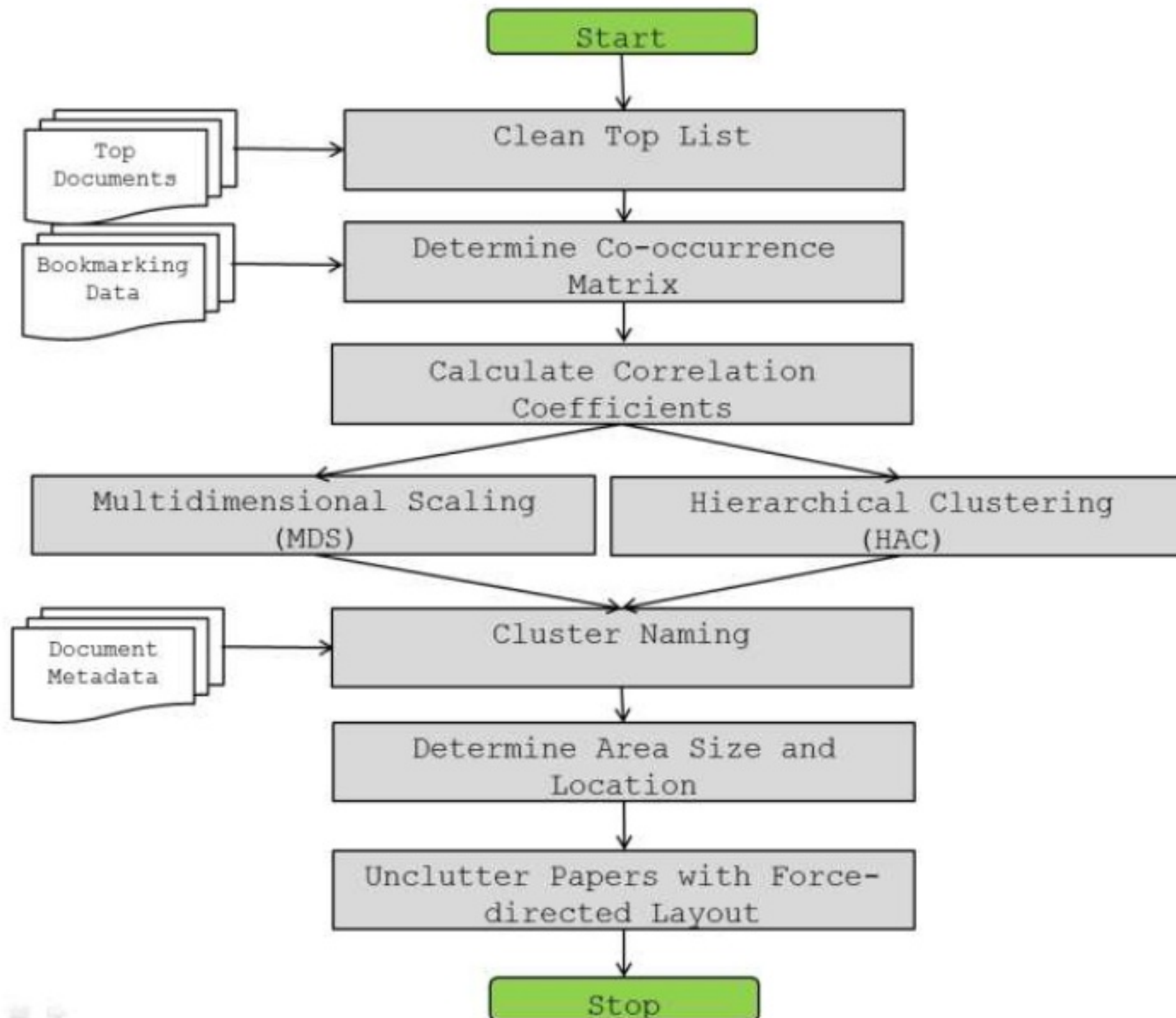
Rate the relevance of this talk to your interests. (not relevant at all) 1 2 3 4 5 (strongly relevant)

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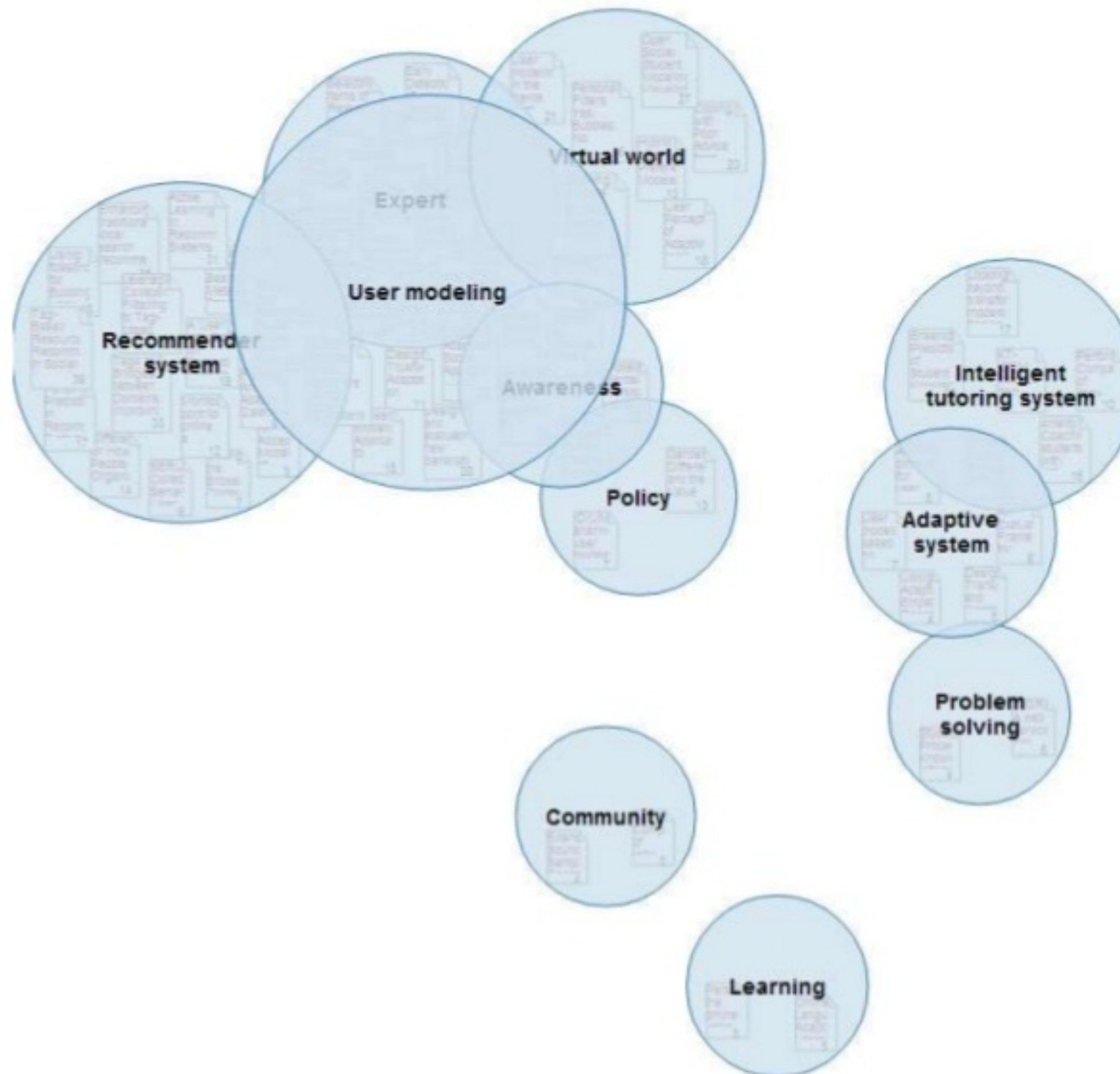
[Factorization techniques for student performance classification and ranking \(2\)](#) [Modeling the Learner in 4-D \(2\)](#) [A Simple but Effective Method to Incorporate Trusted Neighbors in Recommender Systems \(2\)](#)



Method



Results



<http://stellar.know-center.tugraz.at/umap/>

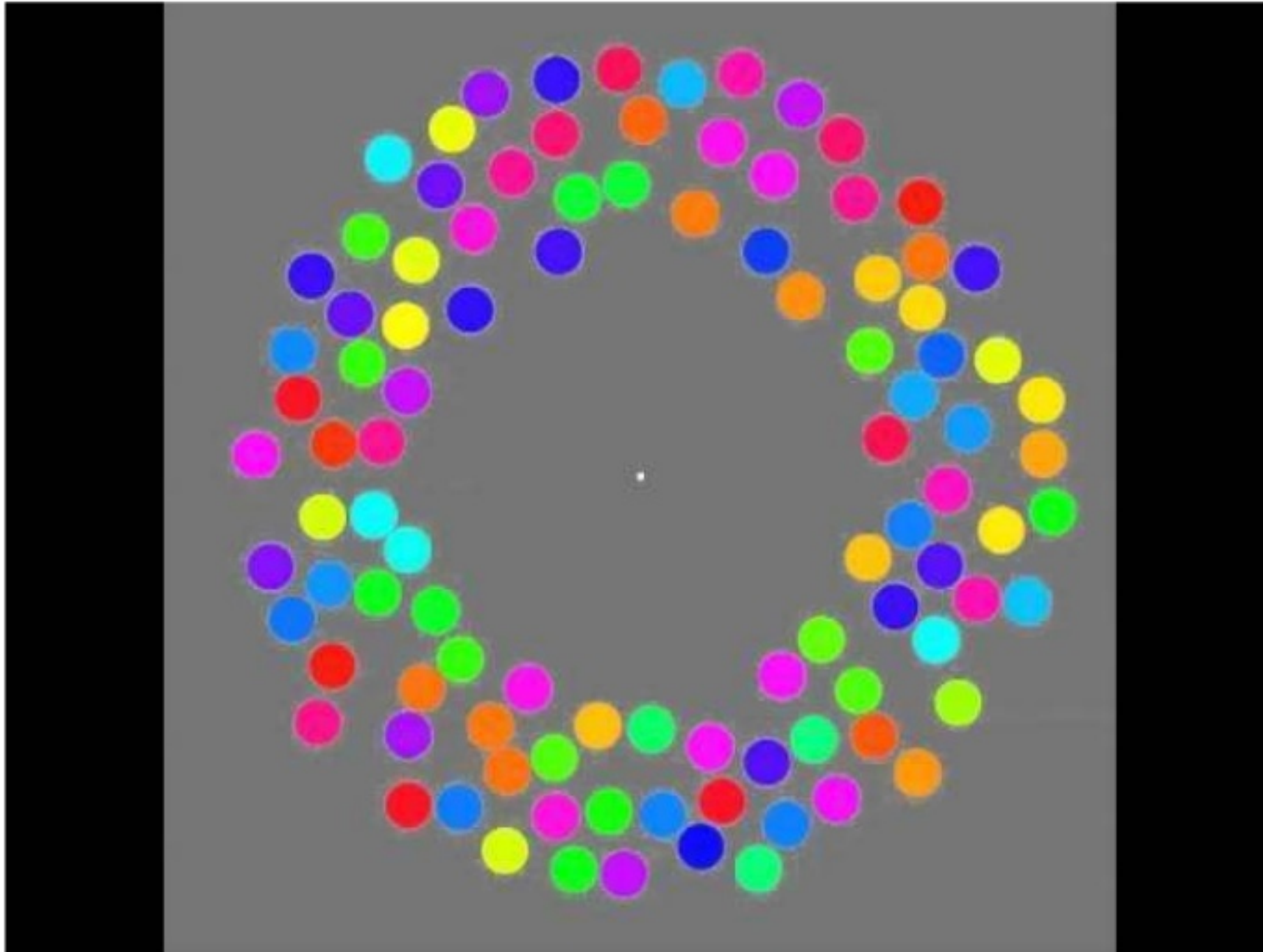
Visualization of Time-Series Data

Simple visualizations are not able to convey all necessary dimensions of the data

Animation

- ❑ Change blindness: people have difficulties recognizing change in an object or a scene (Simons and Rensink, 2005)
- ❑ The effect can also be observed in animation

Visualization of Time-Series Data



Suchow & Alvarez (2011)

<http://vimeo.com/18074674>

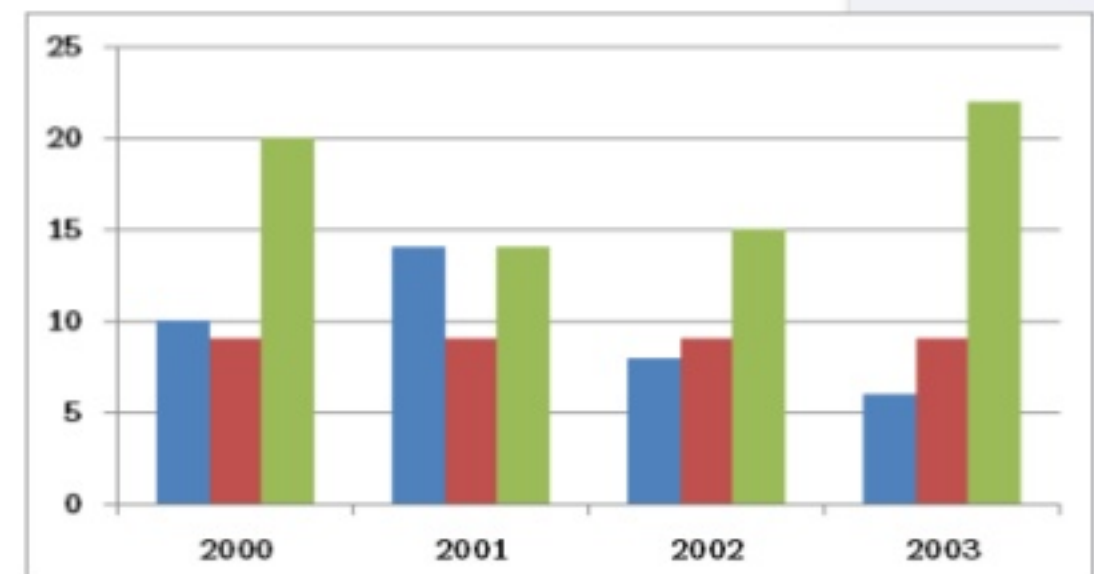
Visualization of Time-Series Data

Simple visualizations are not able to convey all necessary dimensions of the data

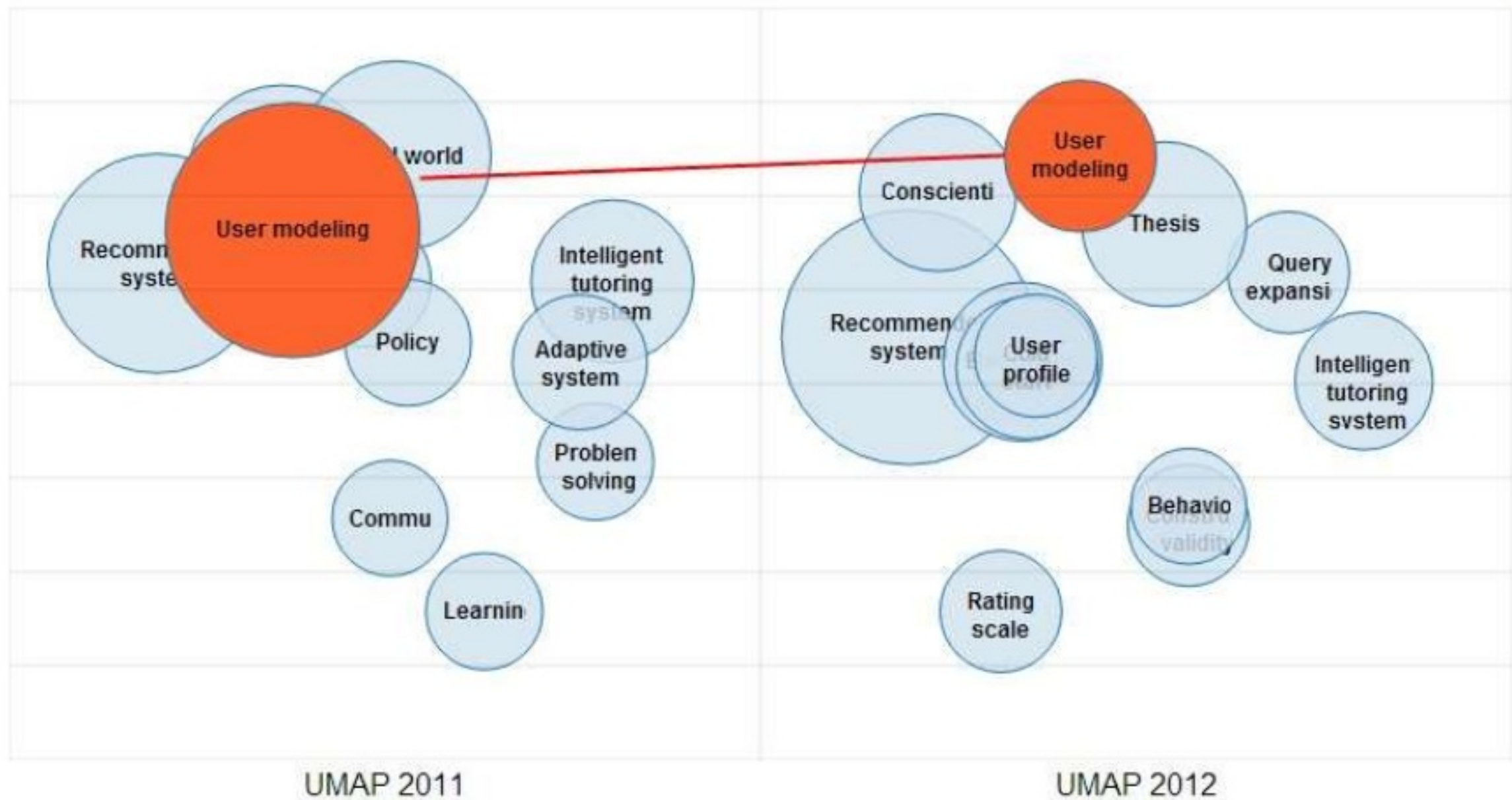
Animation

- Change blindness: people have difficulties recognizing change in an object or a scene (Simons and Rensink, 2005)
- The effect can also be observed in animation

→ Solution: Small Multiples (Tufte, 1990)



Results



Discussion and Outlook

First results are encouraging...

...but there are certain problems:

- ❑ Topology → force-directed layout
- ❑ Method depends on usage of the system
- ❑ Continuity → moving time windows of two years

Outlook

- ❑ Further use cases and longer timeframes
- ❑ Evaluation: Comparison to other measures, expert interviews

References

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Dank u voor uw aandacht!

Comments? Questions?

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Code:

<http://github.com/pkraker/Headstart>

Demo:

<http://stellar.know-center.tugraz.at/umap>

