ConToVi: Multi-Party Conversation Exploration using Topic-Space Views

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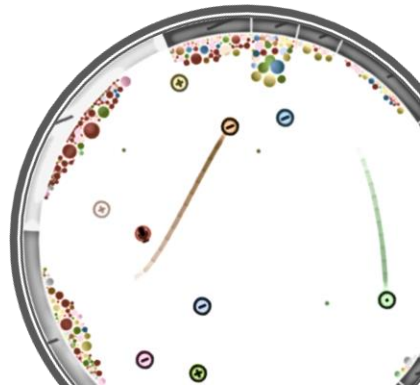
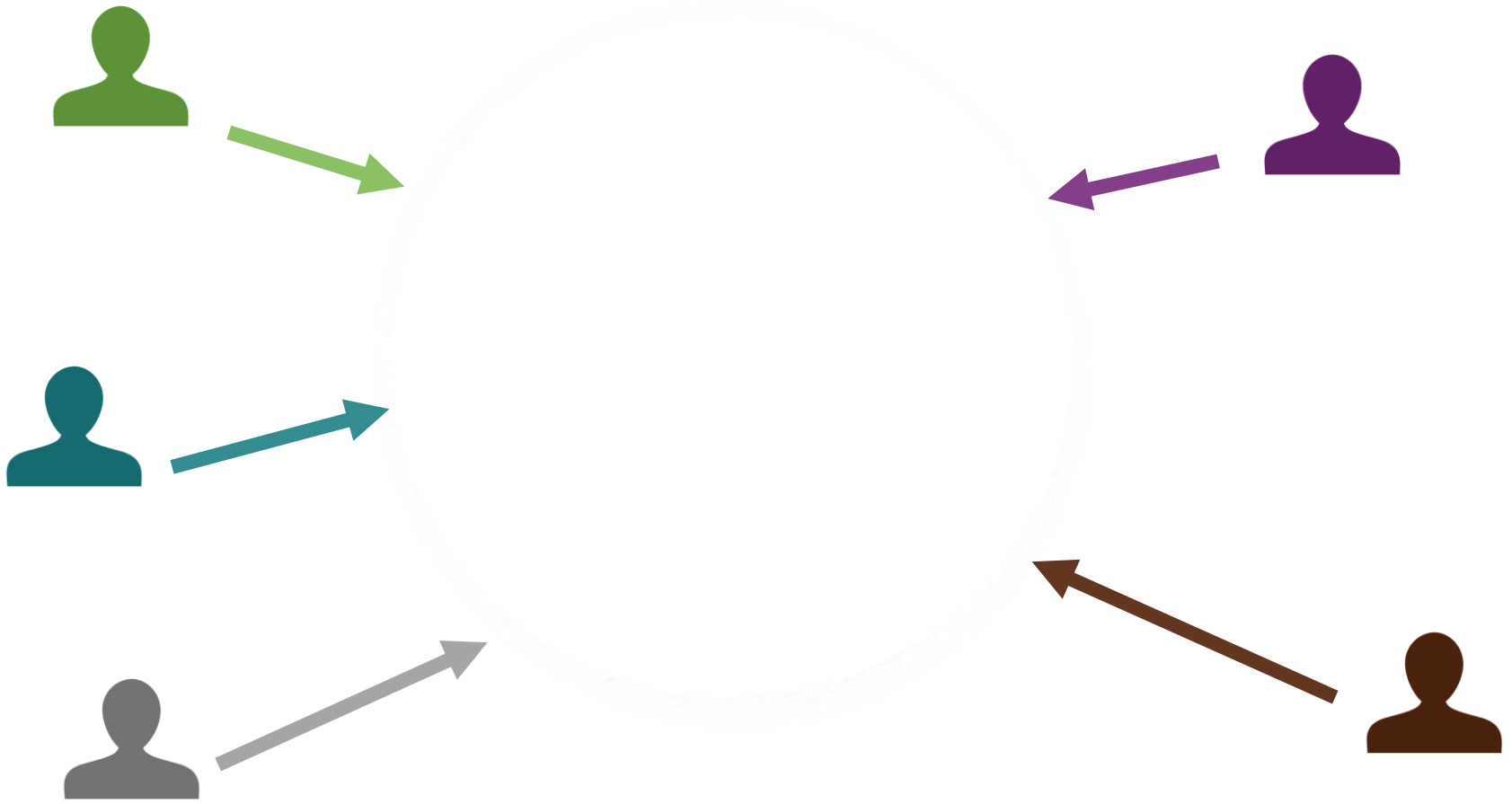


http://images.huffingtonpost.com/2012-10-19-PresidentialDebate10172012.jpg

Modeling interactions between speakers

Let's open the floor for a discussion...



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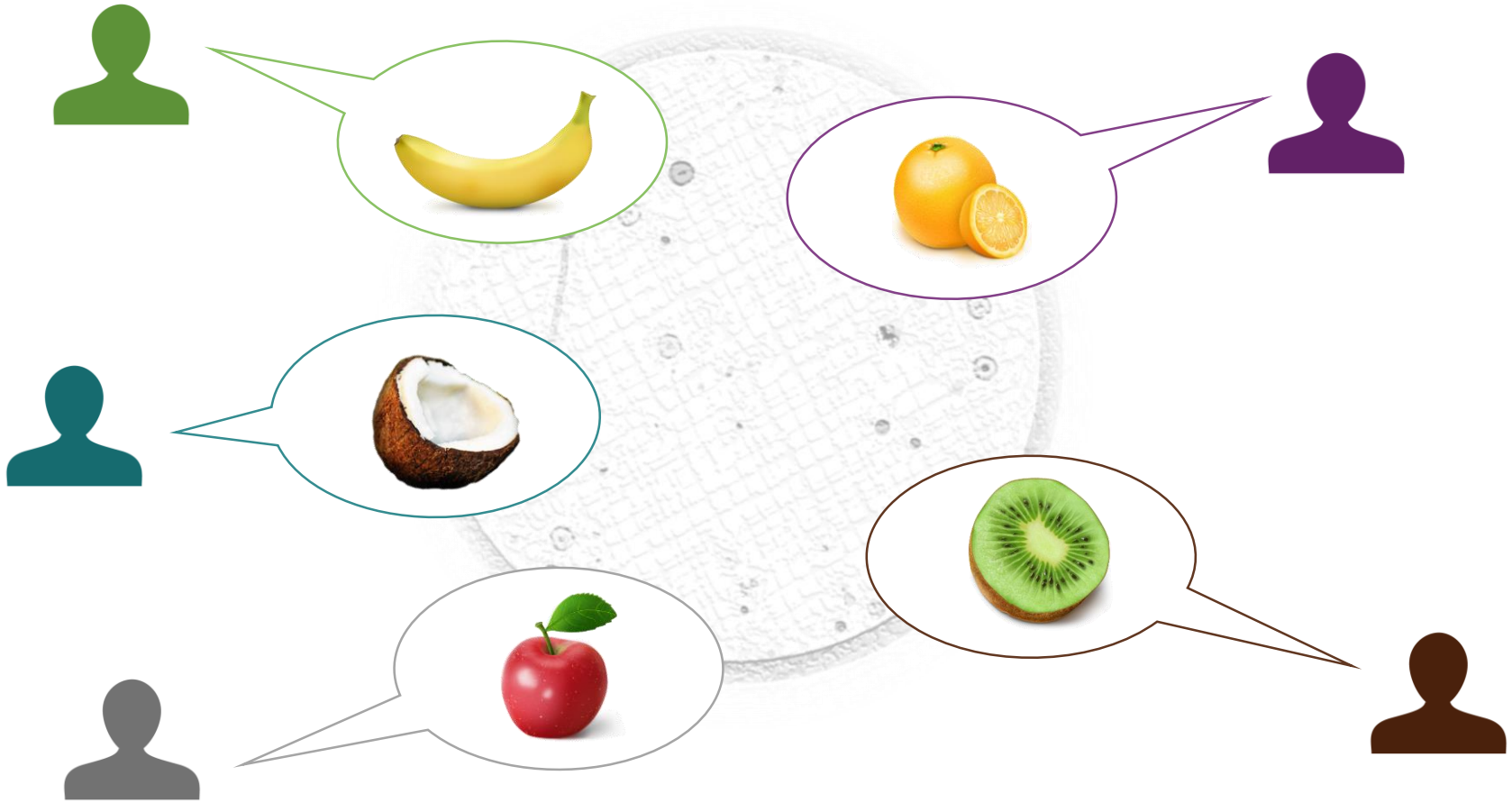
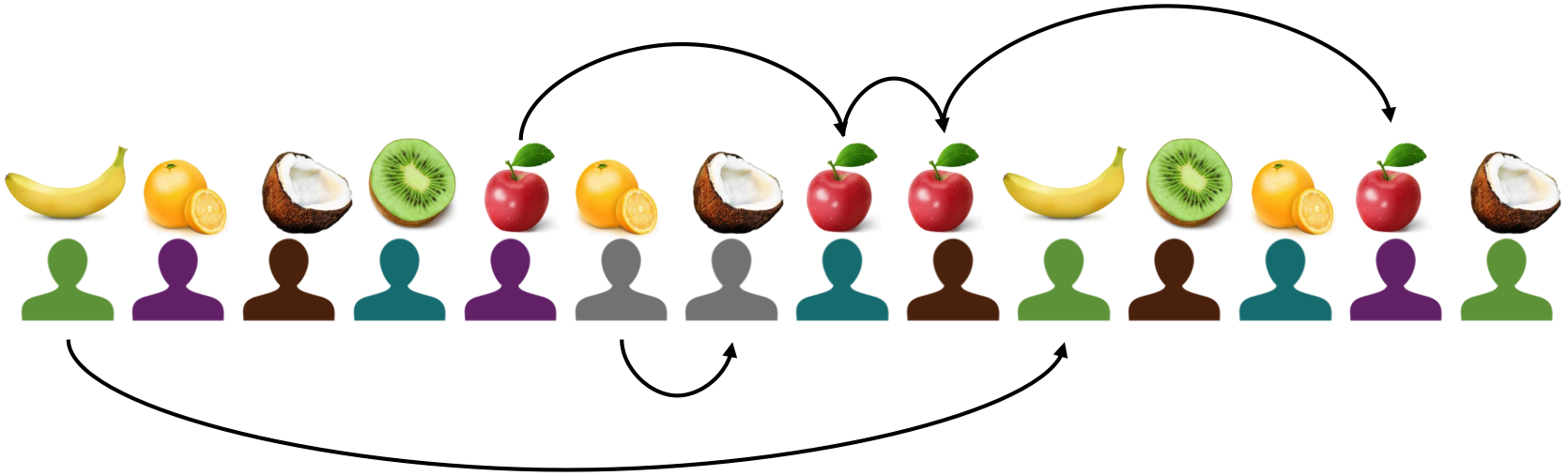




Requirements

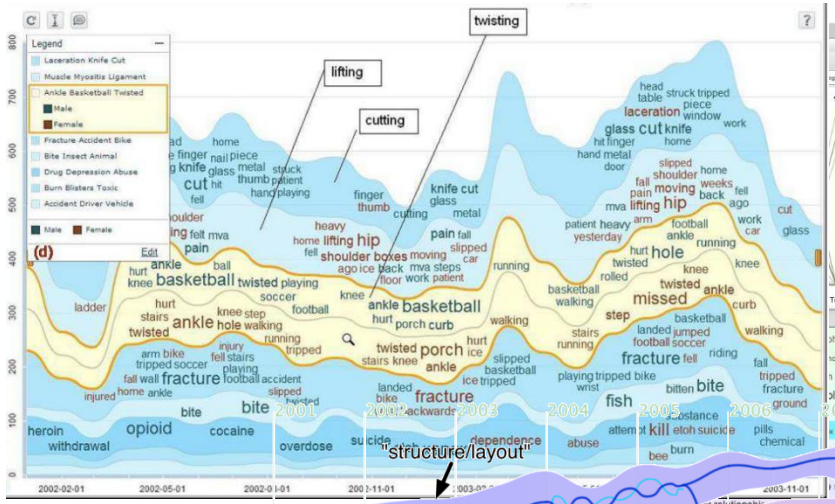
Speaker Movement Analysis:

- [R1] Retracing a **sequence** of speakers and topics over time.
- [R2] Identifying the **influence** of a speaker on the conversation.
- [R3] Analyzing the **control** of speakers for a specific topic.

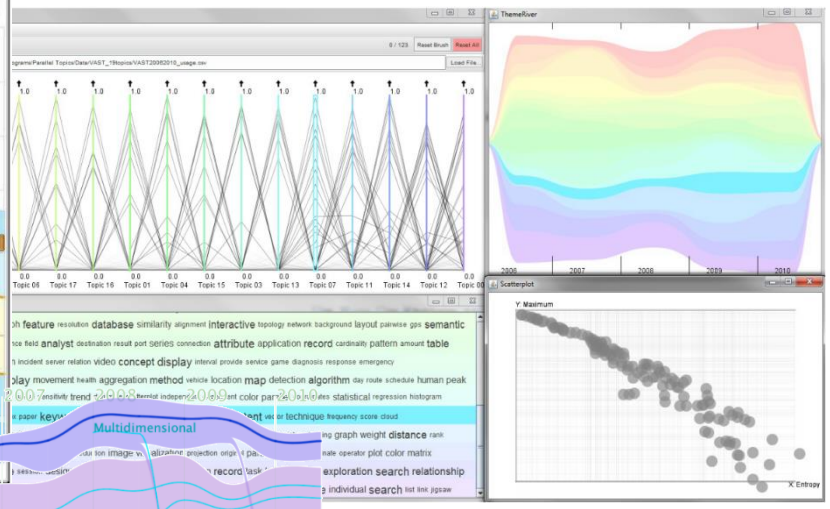
Behavior Pattern Analysis:

- [R4] Exploring **speech and argumentation patterns** for each speaker and topic.
- [R5] Analyzing the **speaker stances** at a given point in time towards a given topic.
- [R6] Comparing the **pattern similarities** of different speakers.

[Wei et al., 2010]

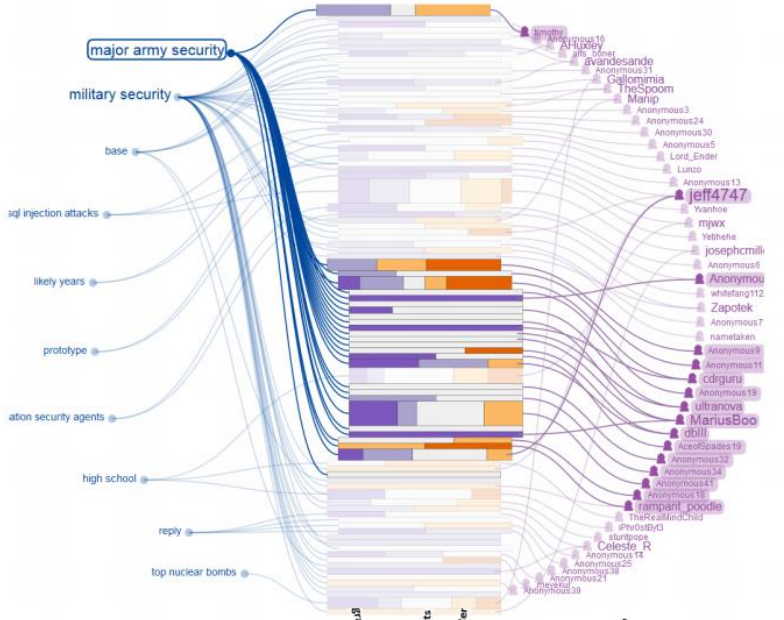


[Dou et al., 2011]

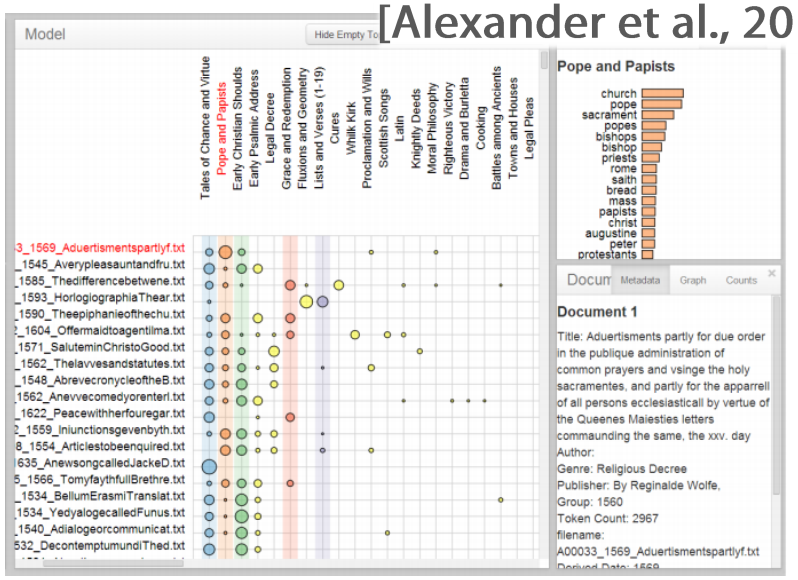


[Cui et al., 2011]

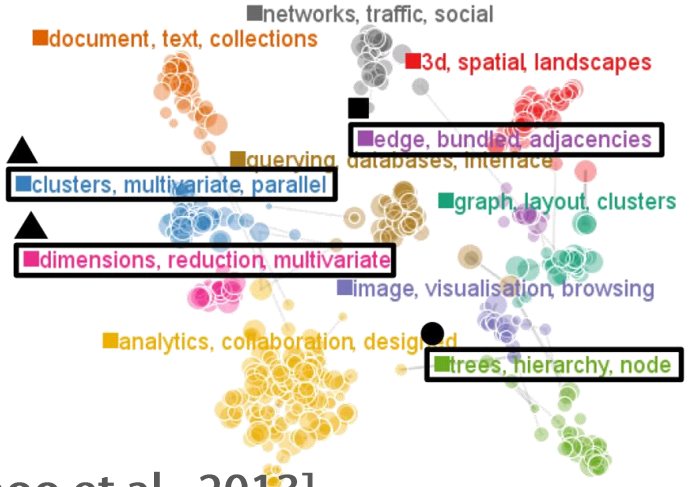
[Hoque et al., 2014]



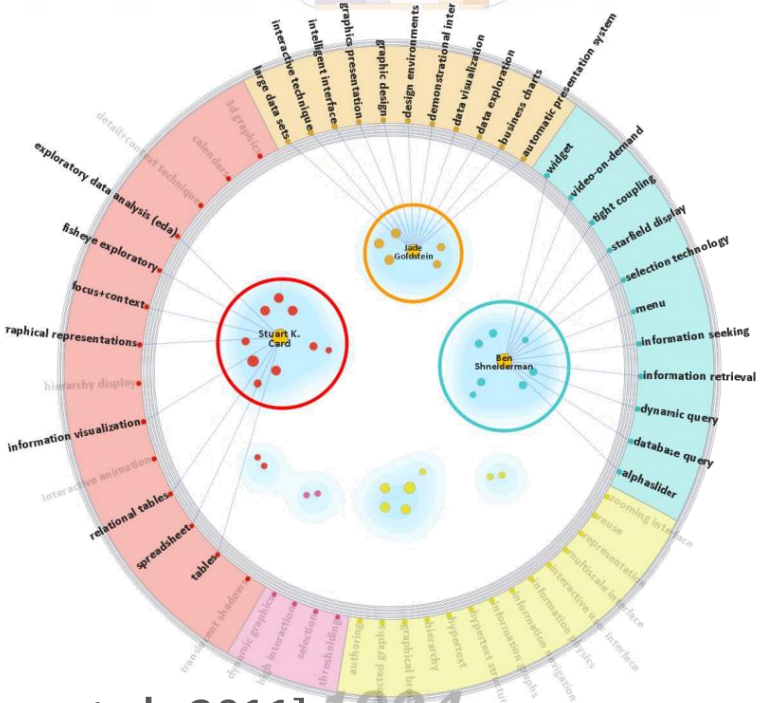
[Alexander et al., 2014]



[Choo et al., 2013]



[Cao et al., 2011]



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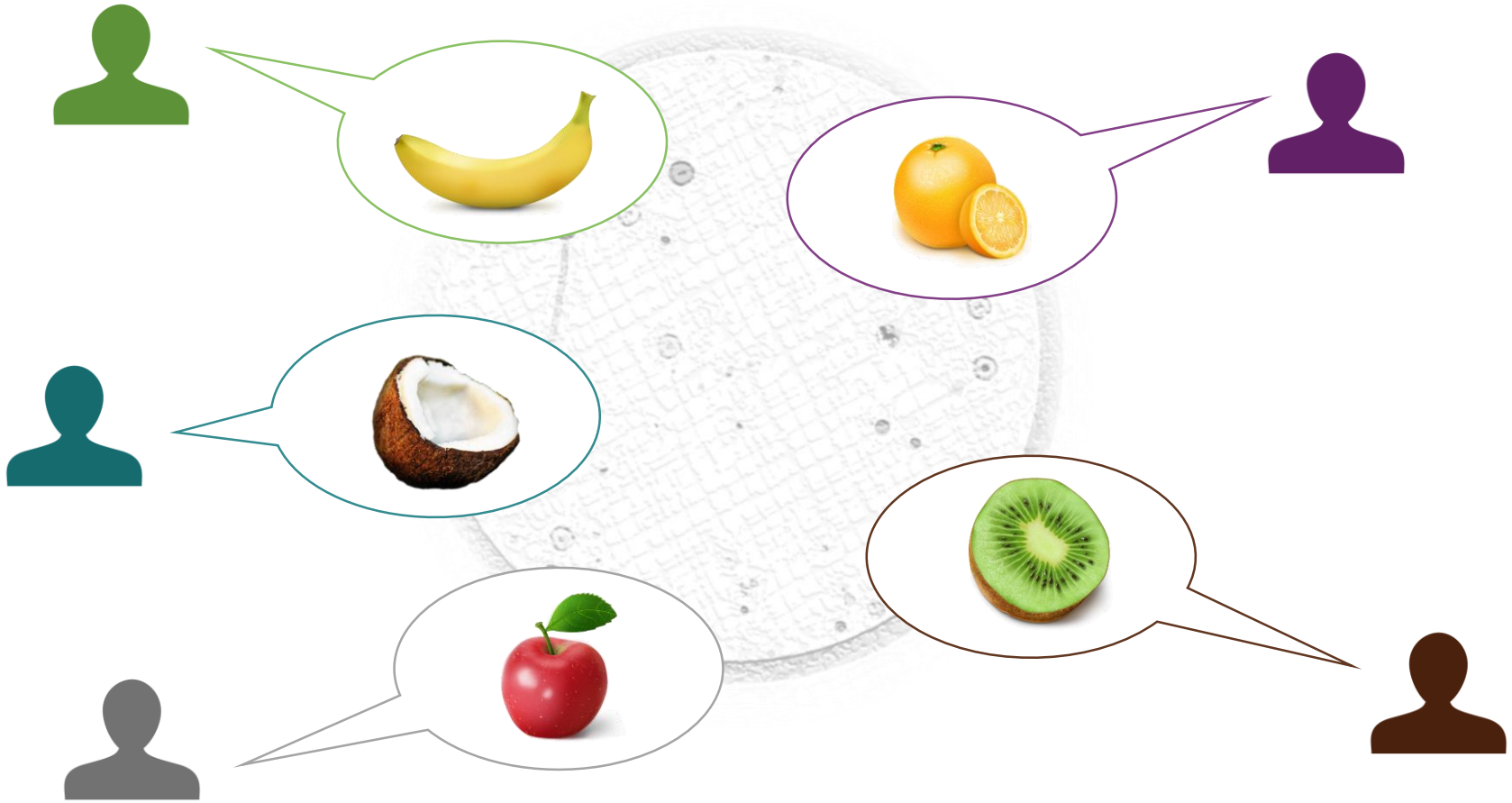
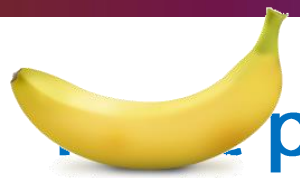
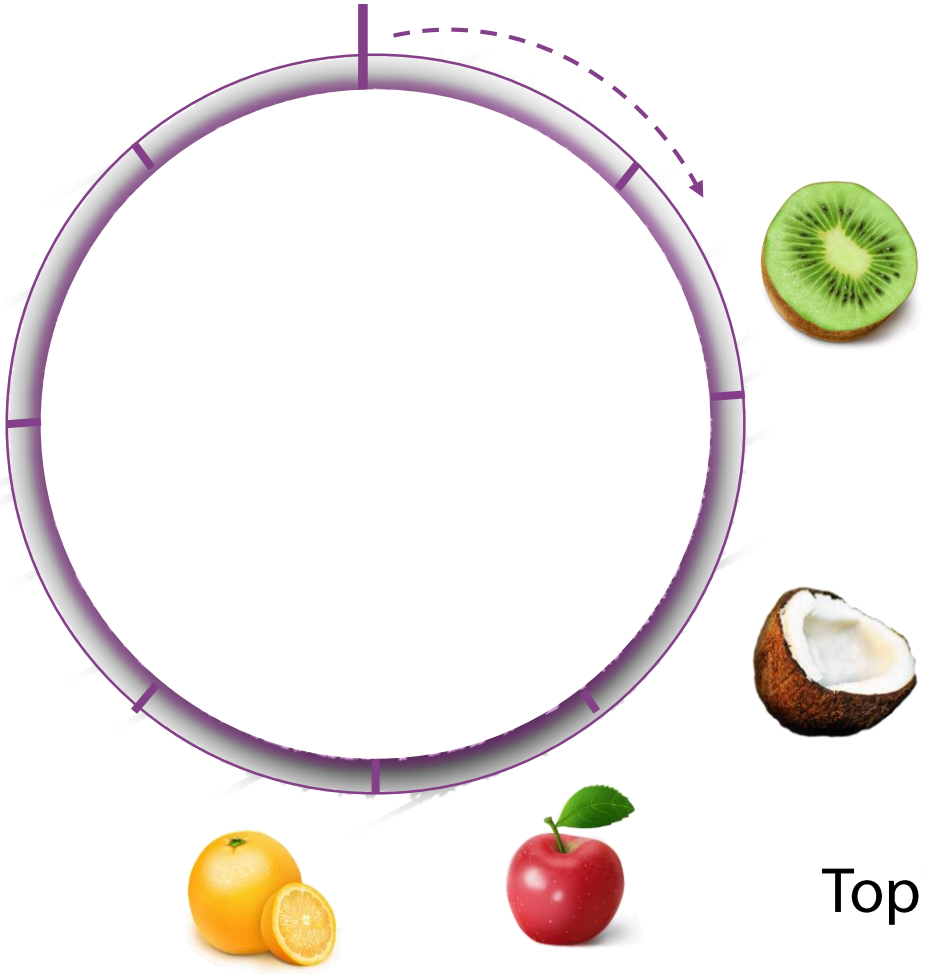




placement on the ~~Discussion Floor~~

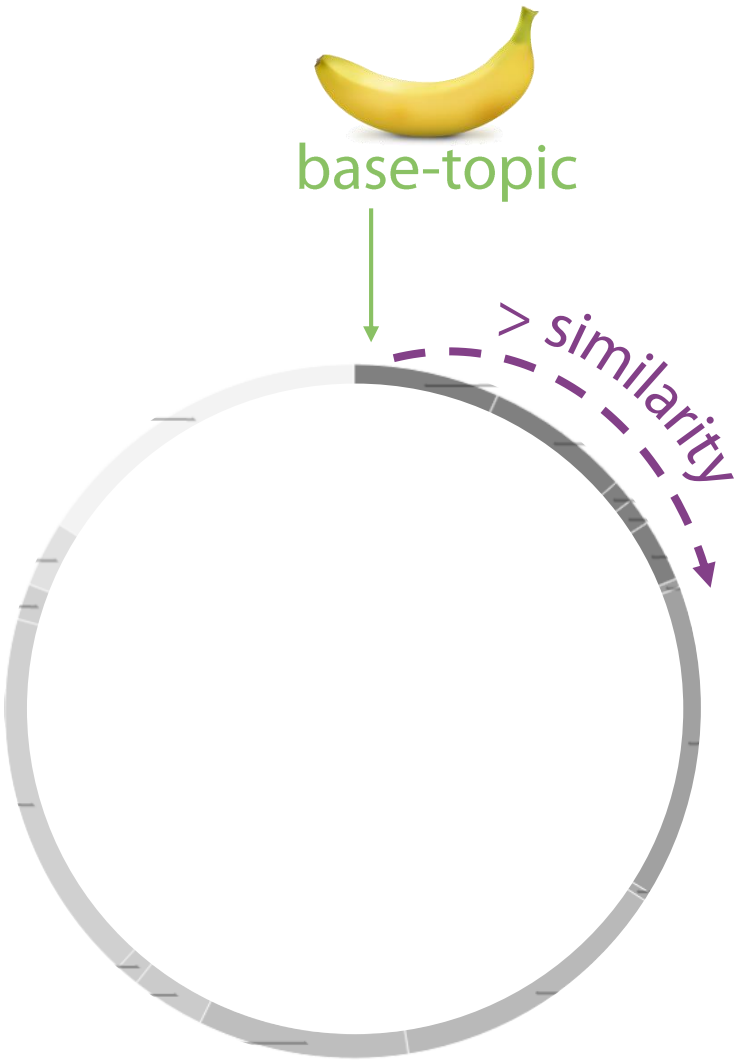
Topic-Space



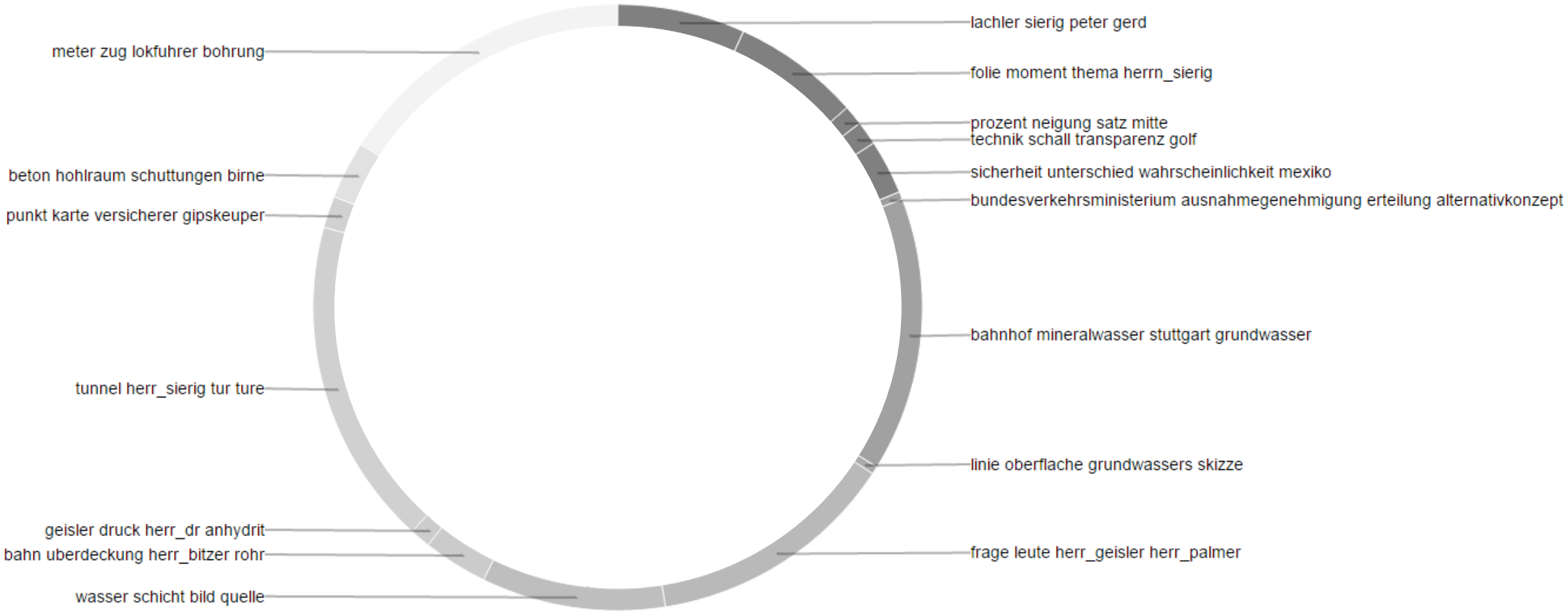
Topic length?

Topic ordering?

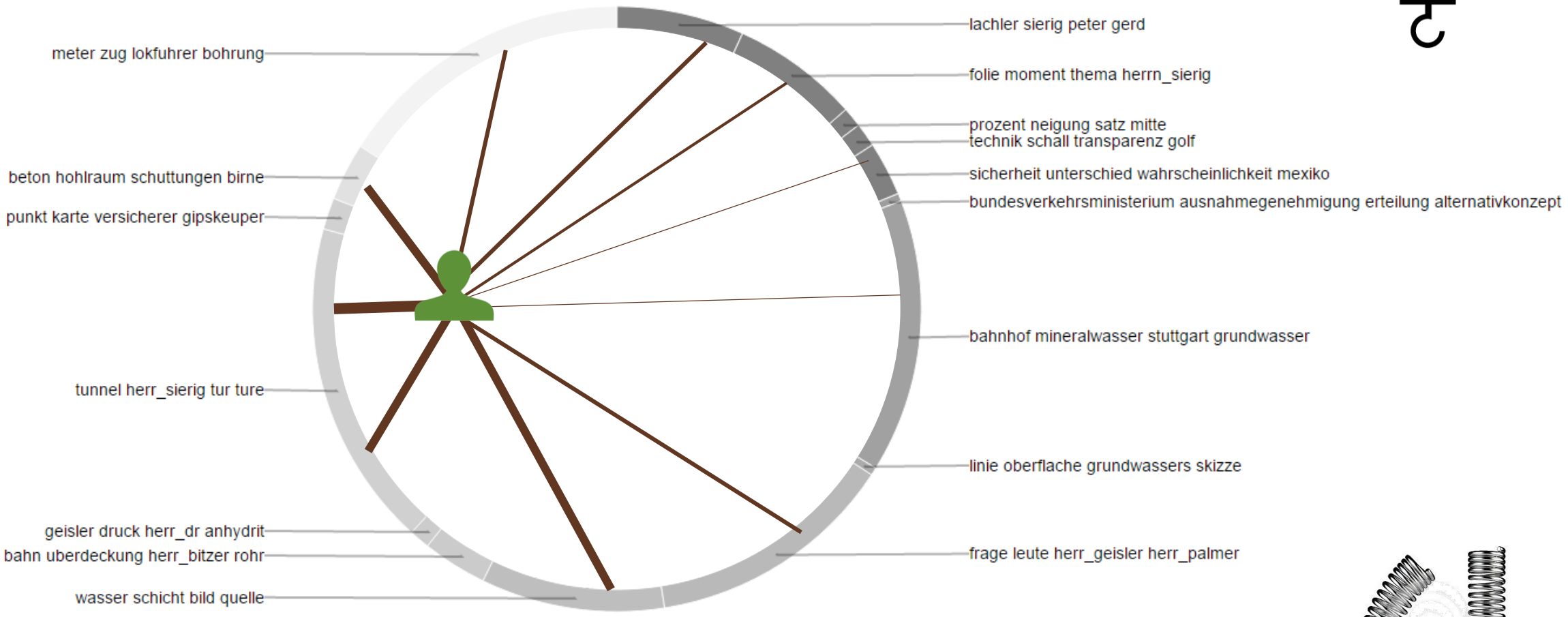
Topic-Space View



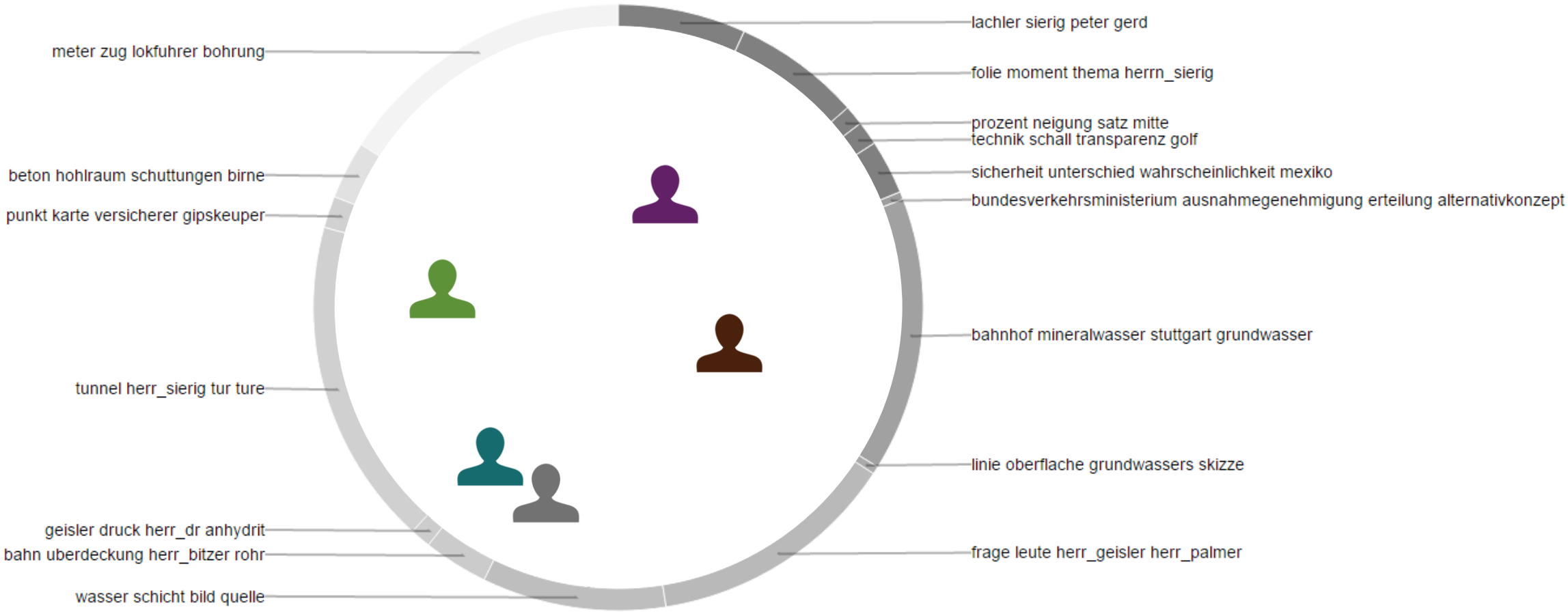
Topic-Space View



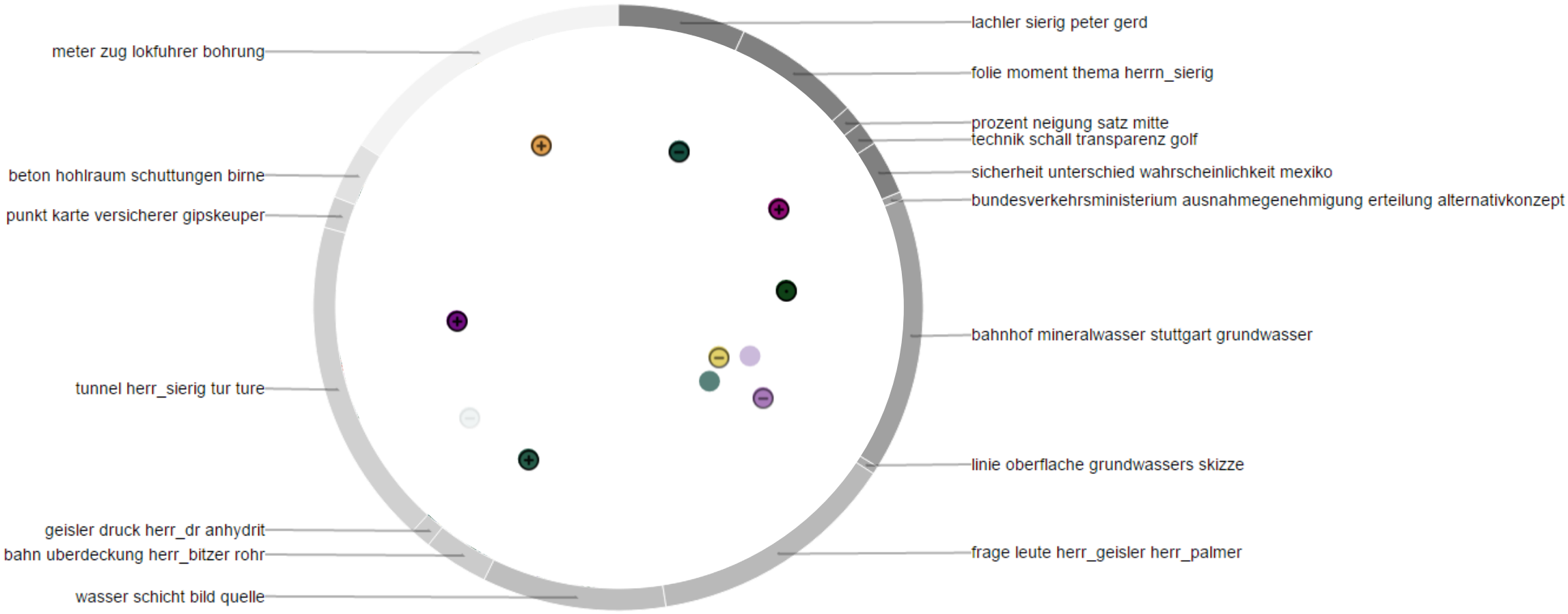
Topic-Space View
Speaker and Utterance Positioning



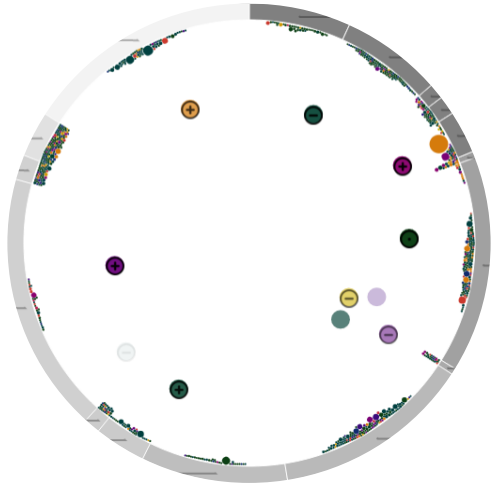
Topic-Space View



Topic-Space View

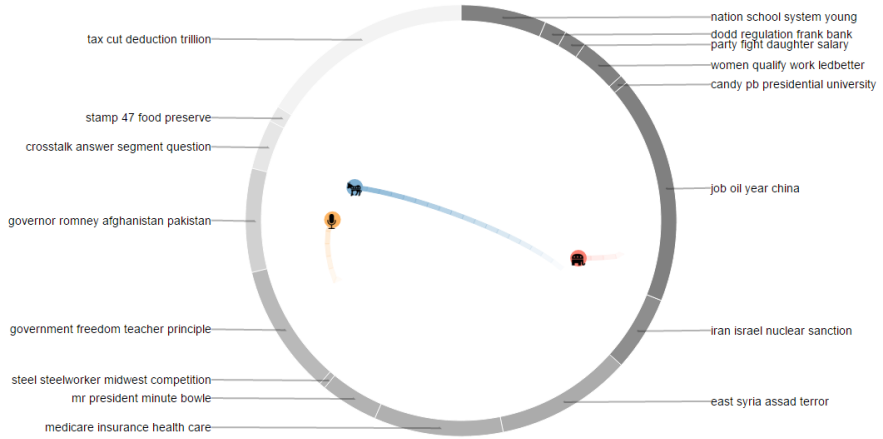


Tasks

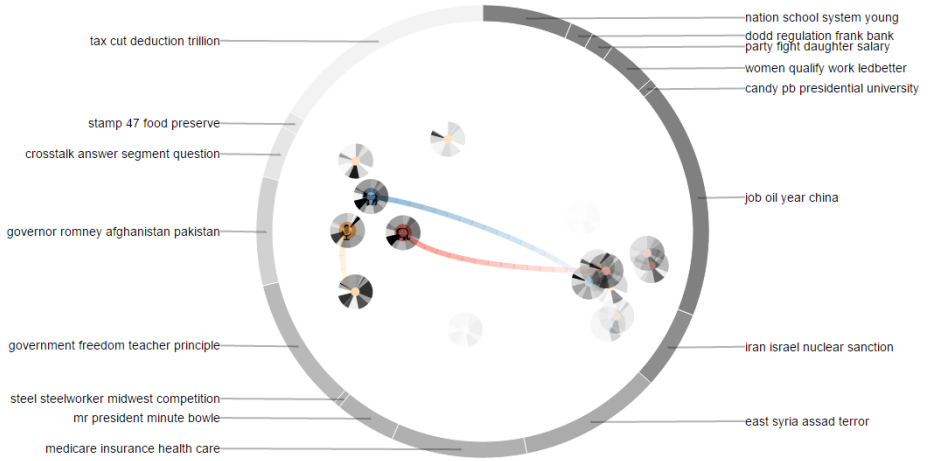


- [T1] Exploration of the conversation and **overview** generation (addressing R1, R2, R3).
- [T2] Analyzing and understanding the **speaker movement** through topic space for selected speakers (addressing R1, R2, R4).
- [T3] Analyzing the **contribution of each speaker** to each topic over time (addressing R2, R3, R6).
- [T4] Analyzing the movement and patterns of **one speaker in detail** (addressing R4, R5, R6).

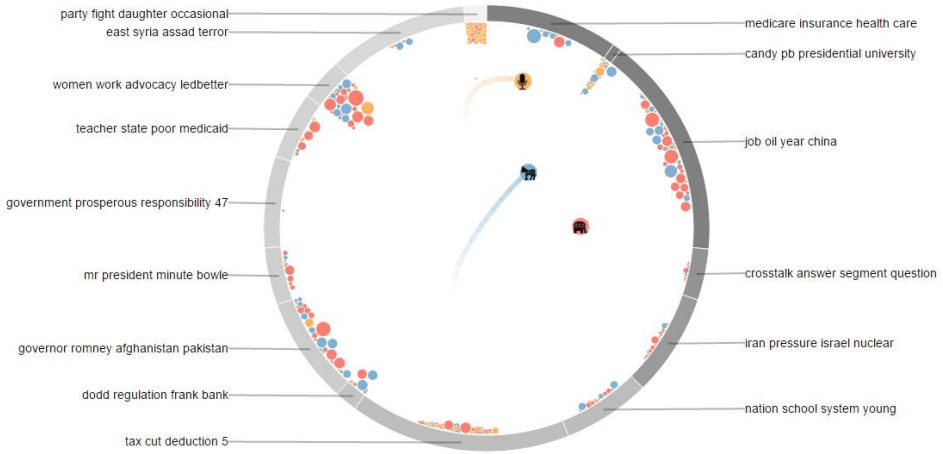
Topic-Space View



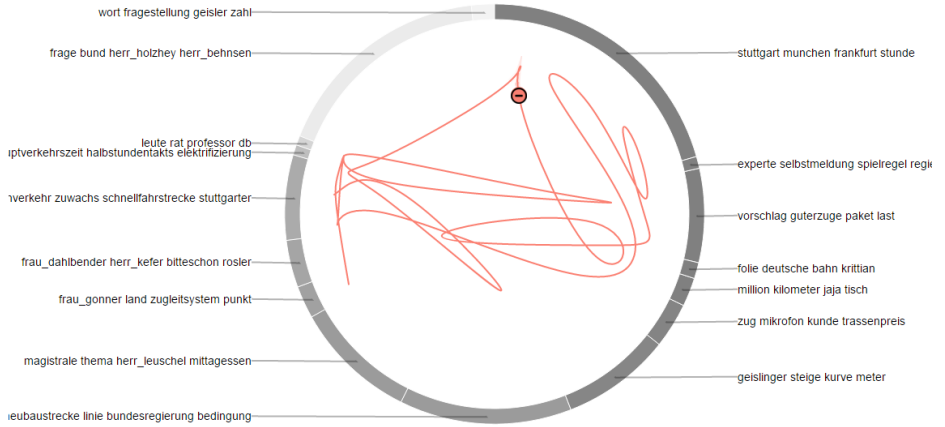
[V1] Discussion Overview with all speakers



[V2] Speaker-Trail-View + Topic-Glyphs

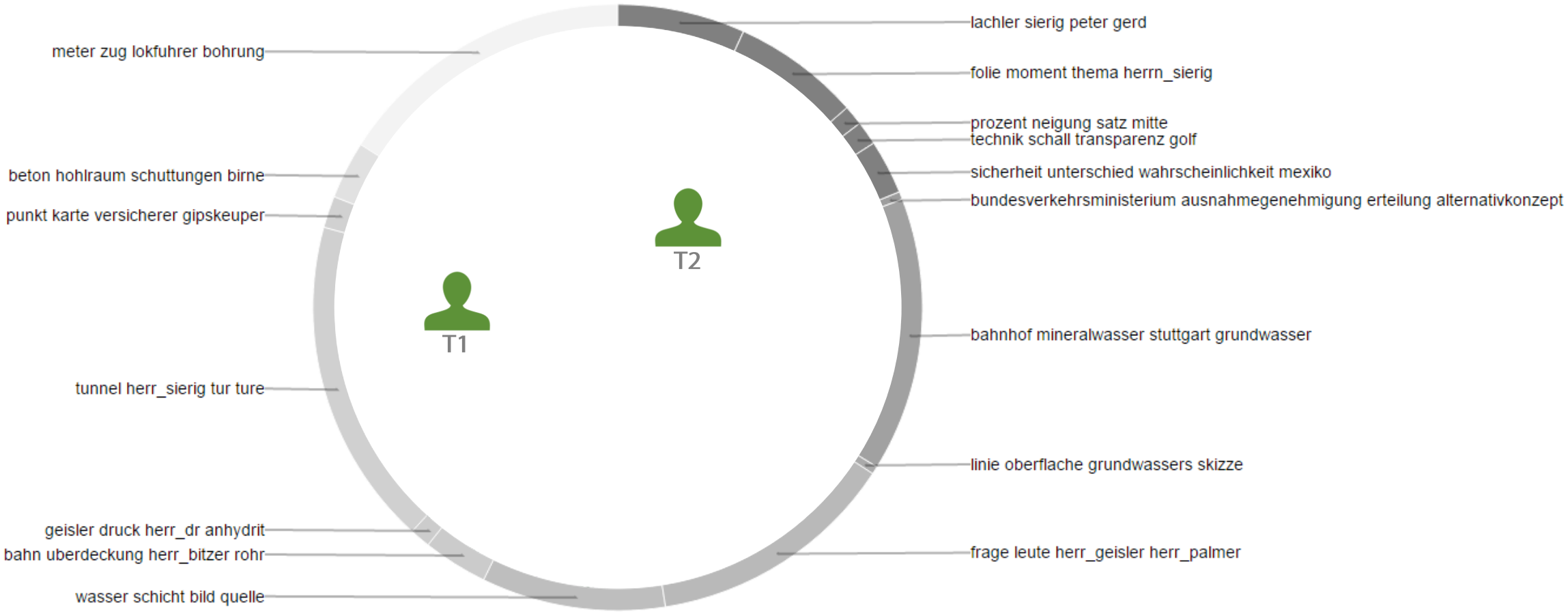


[V3] Utterance-Sedimentation View

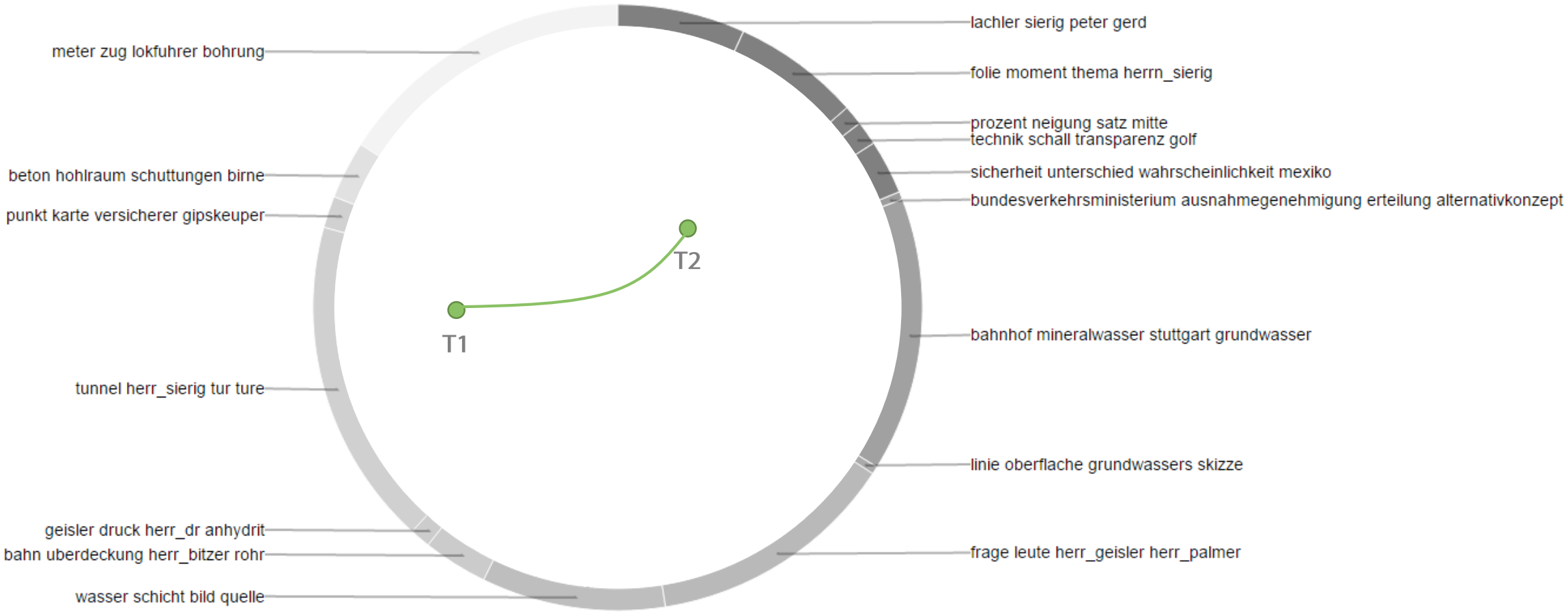


[V4] Speaker-Path View for one speaker

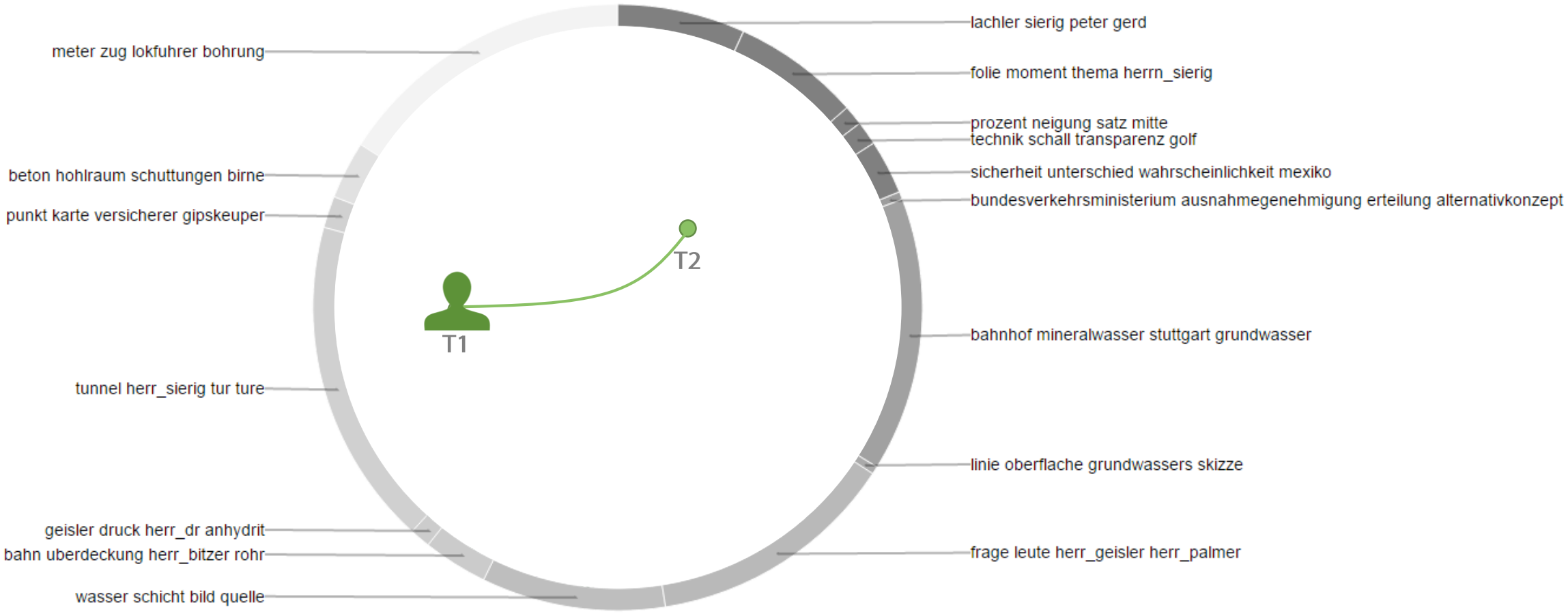
Path Interpolation



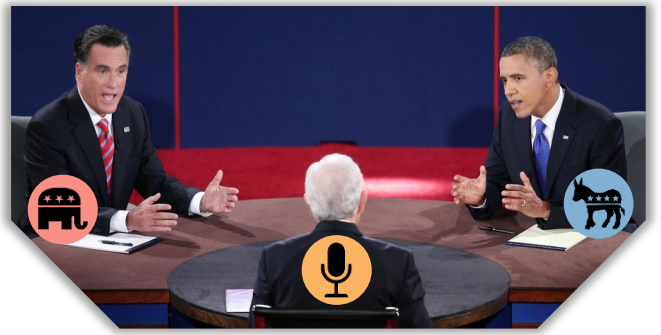
Path Interpolation

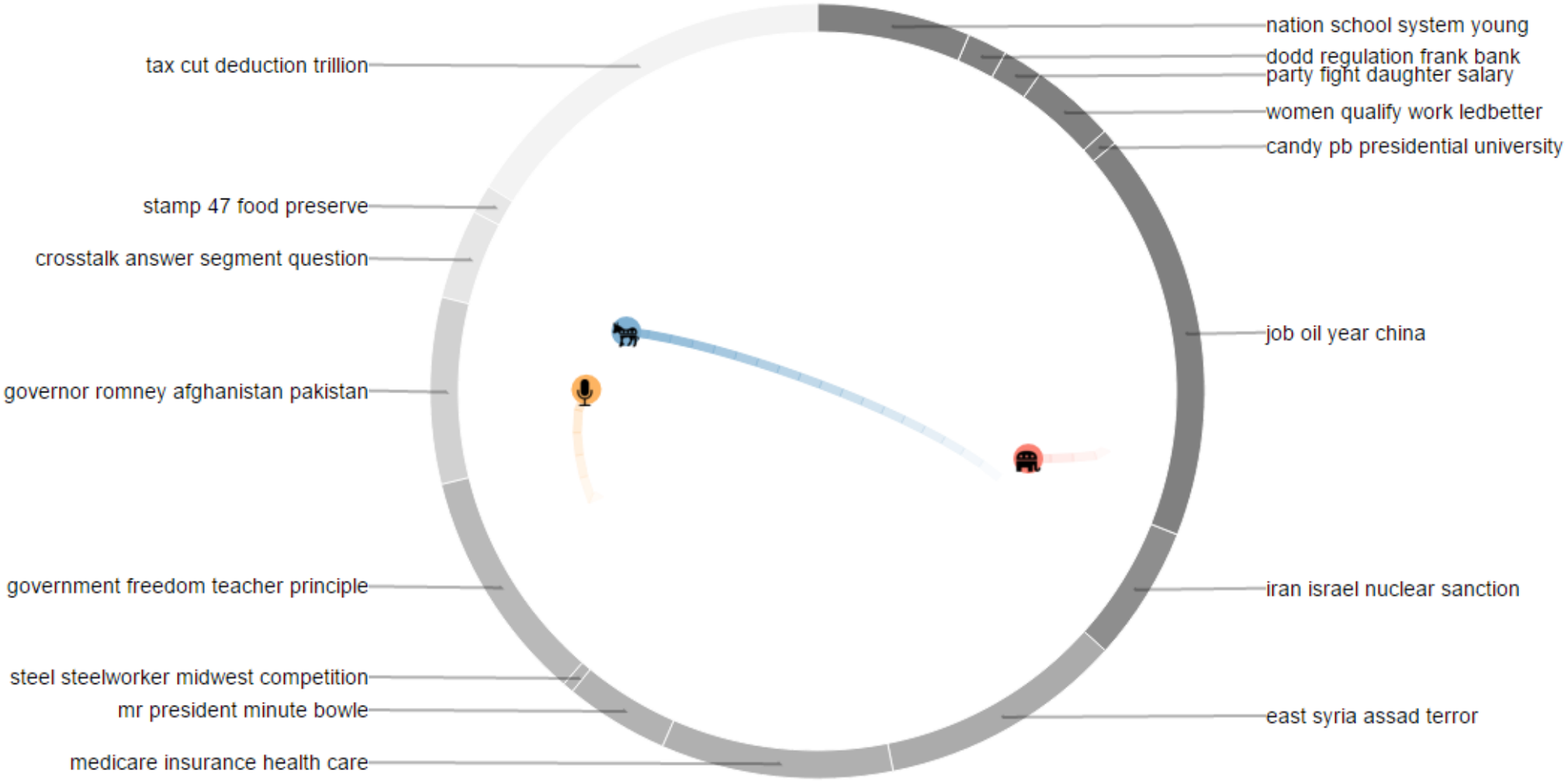


Path Interpolation



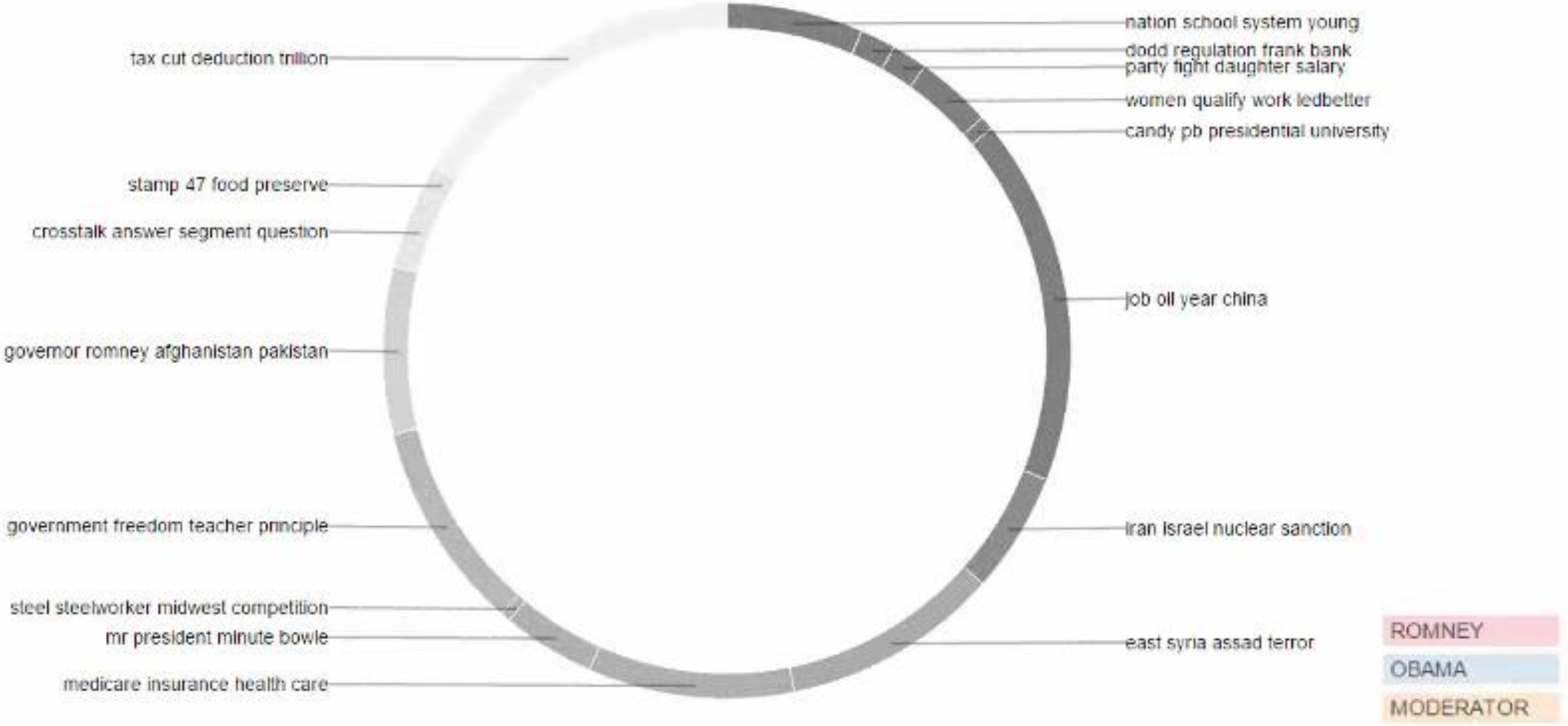
Speaker Trails



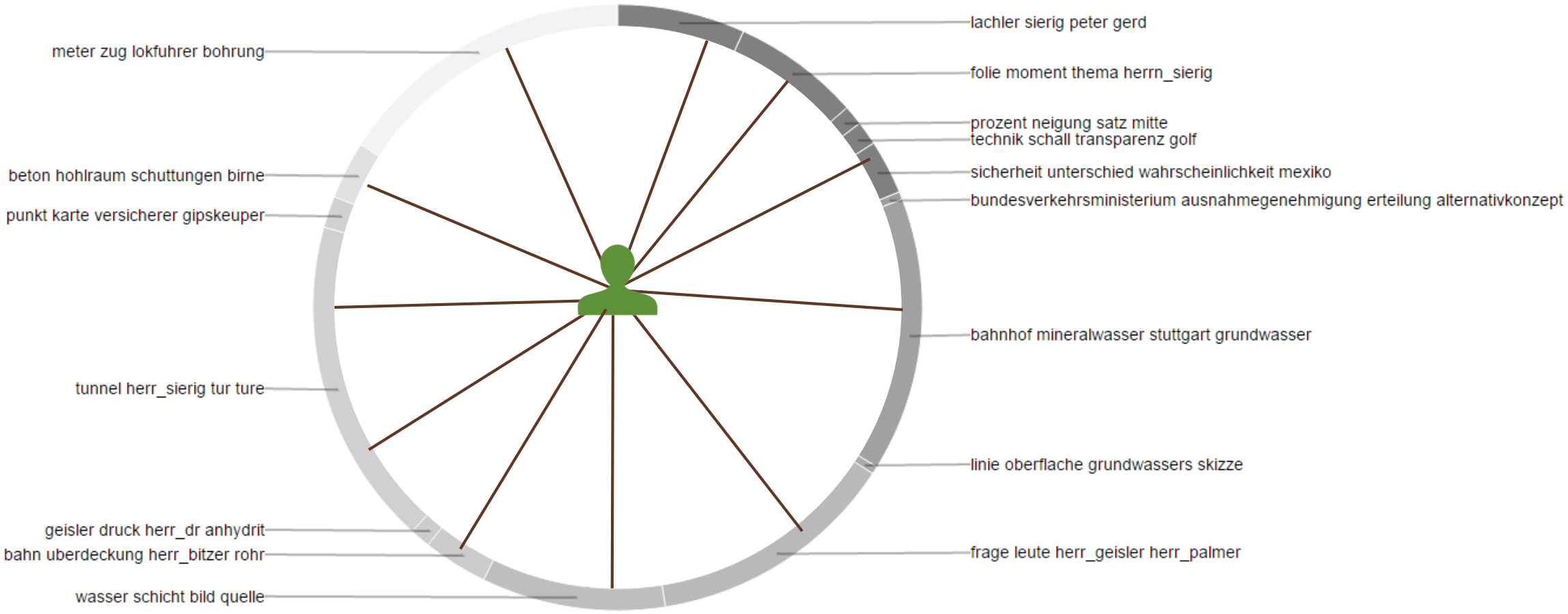


[V1]

Discussion Overview of the Obama vs. Romney Presidential Debates



Understanding the Object Positioning in the Topic Space



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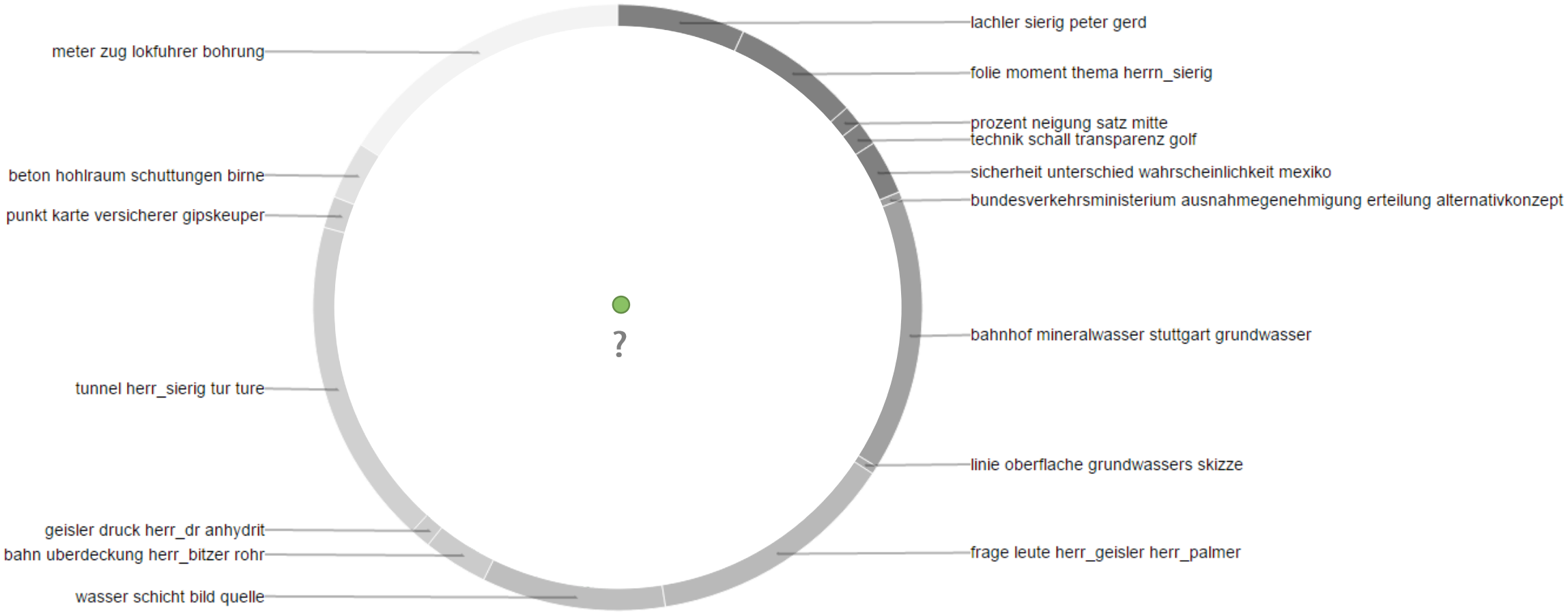

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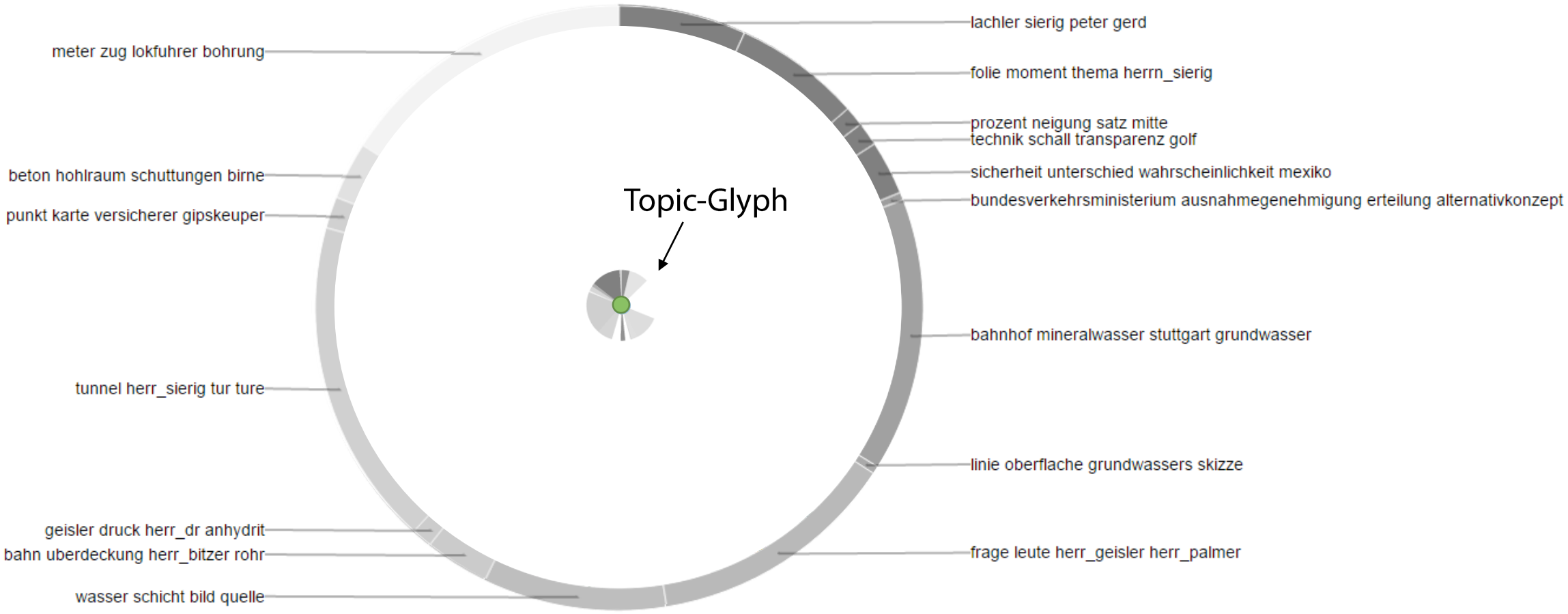
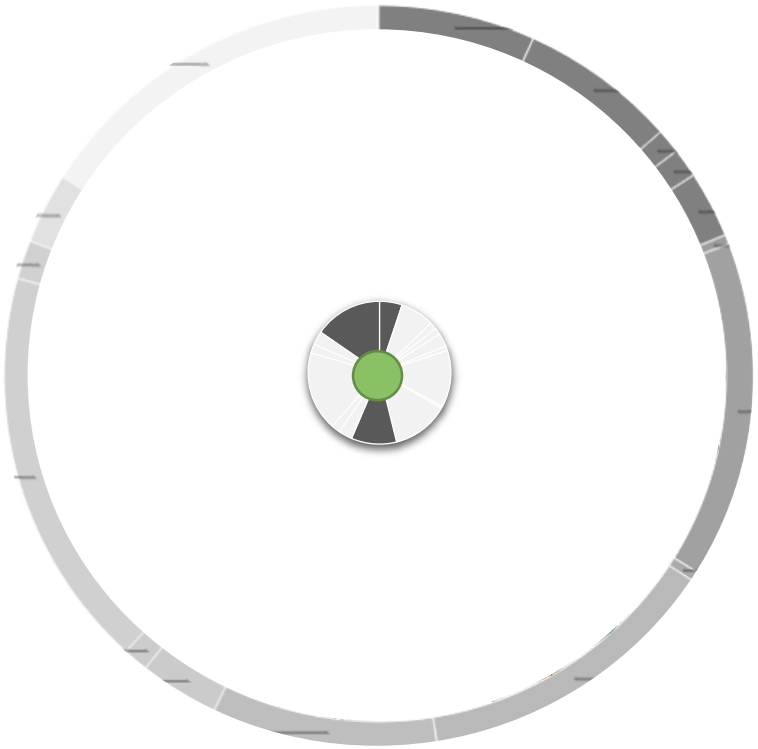
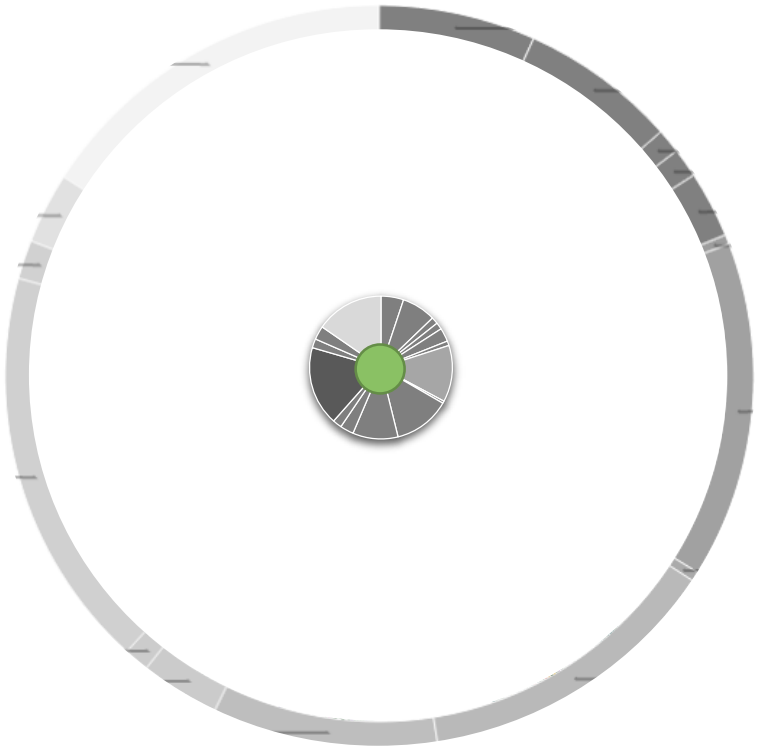
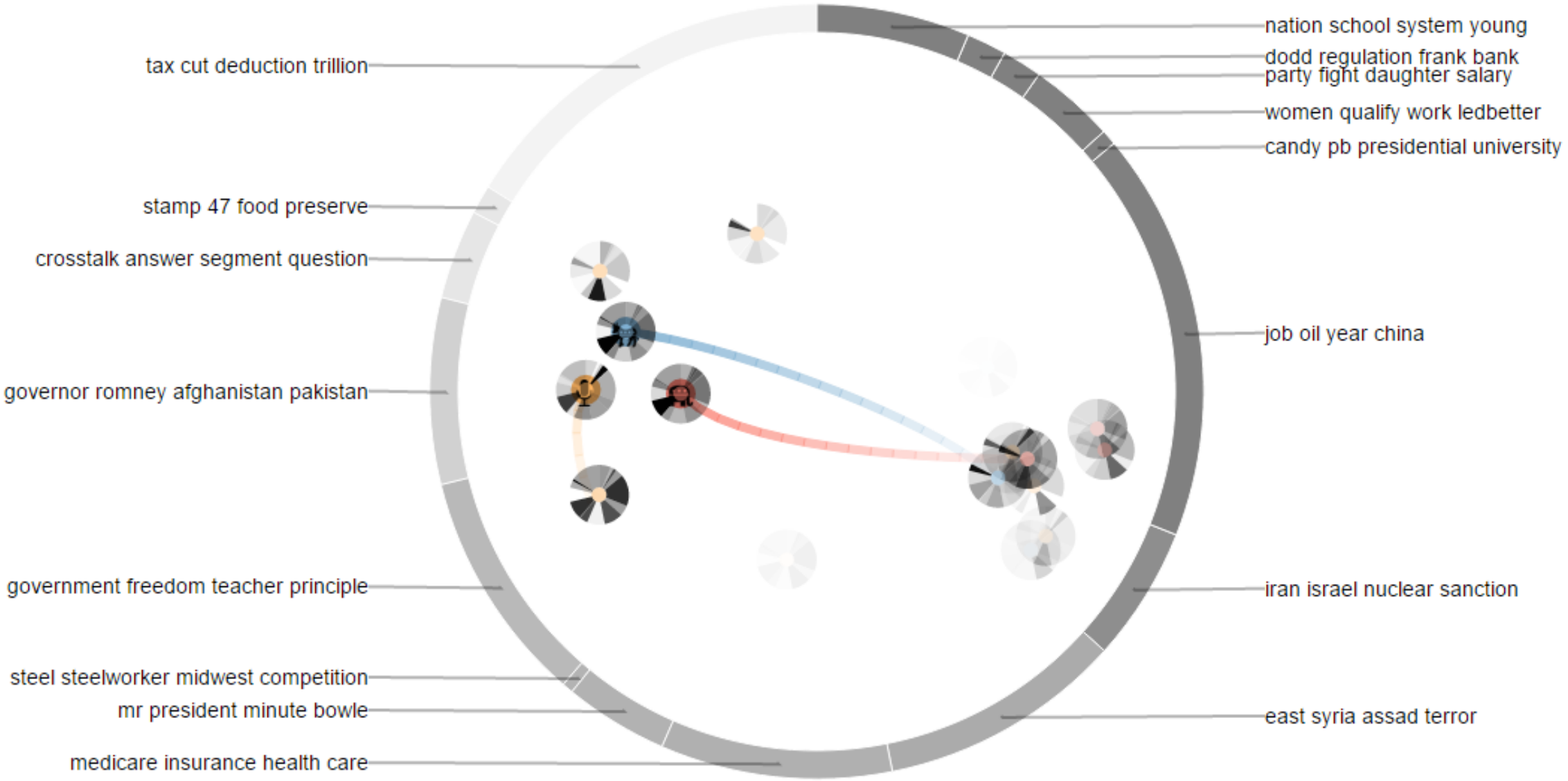


Topic-Glyphs

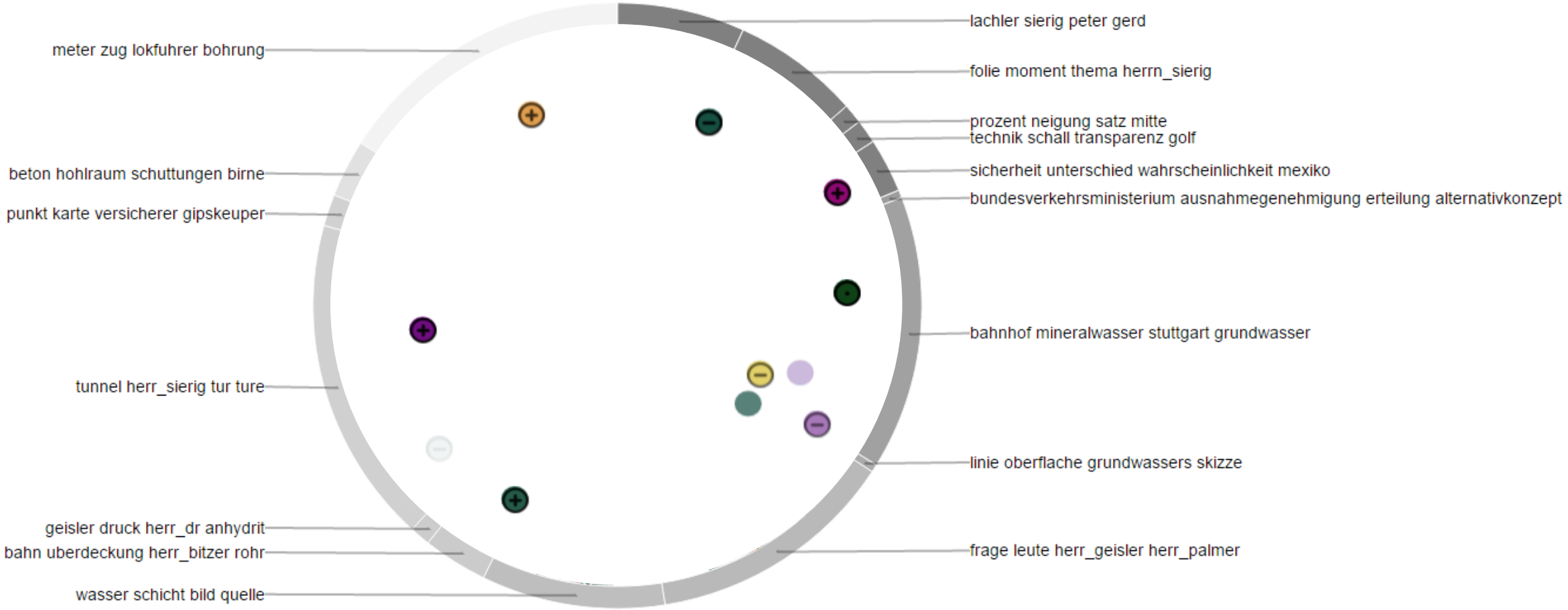




[V2] Speaker-Trail-View + **Topic-Glyphs**



Following the past Utterances of a Conversation



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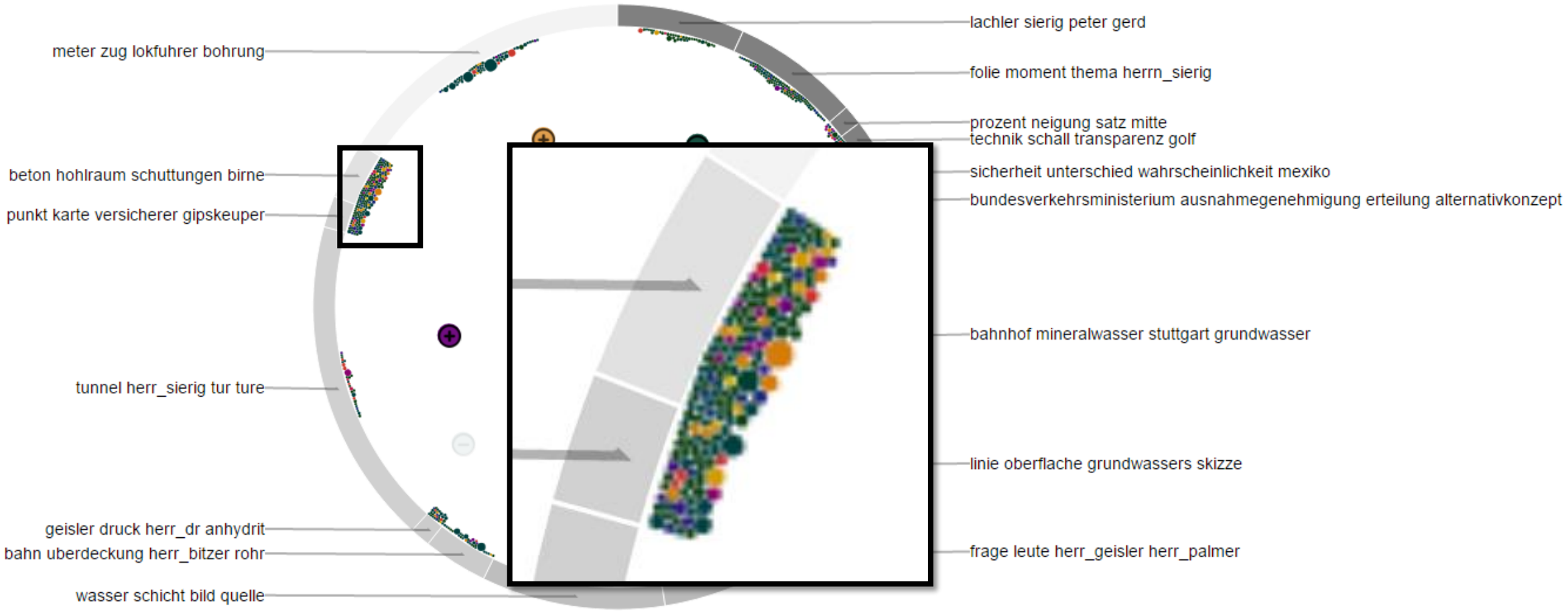
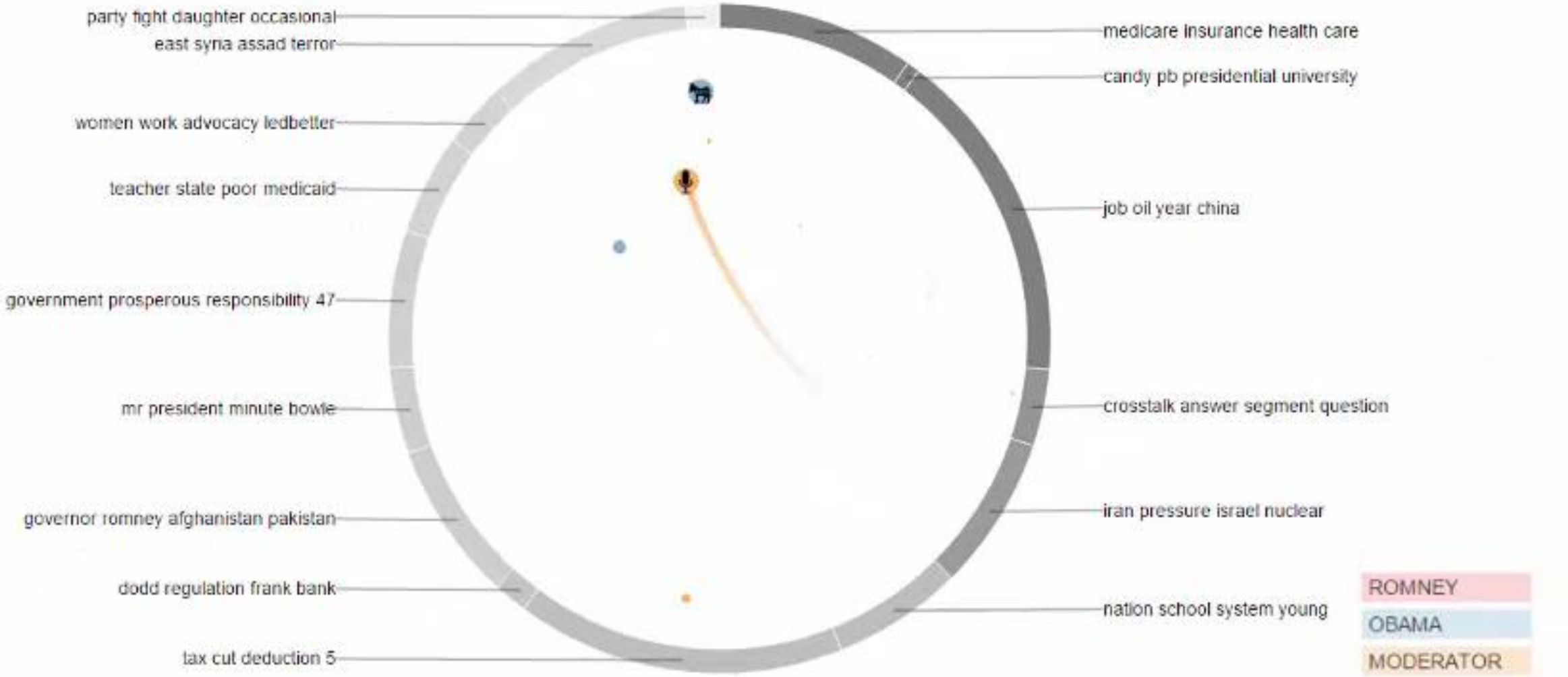


Utterance-Sedimentation

[V3]

Utterance-Sedimentation View of the Obama vs. Romney Presidential Debates



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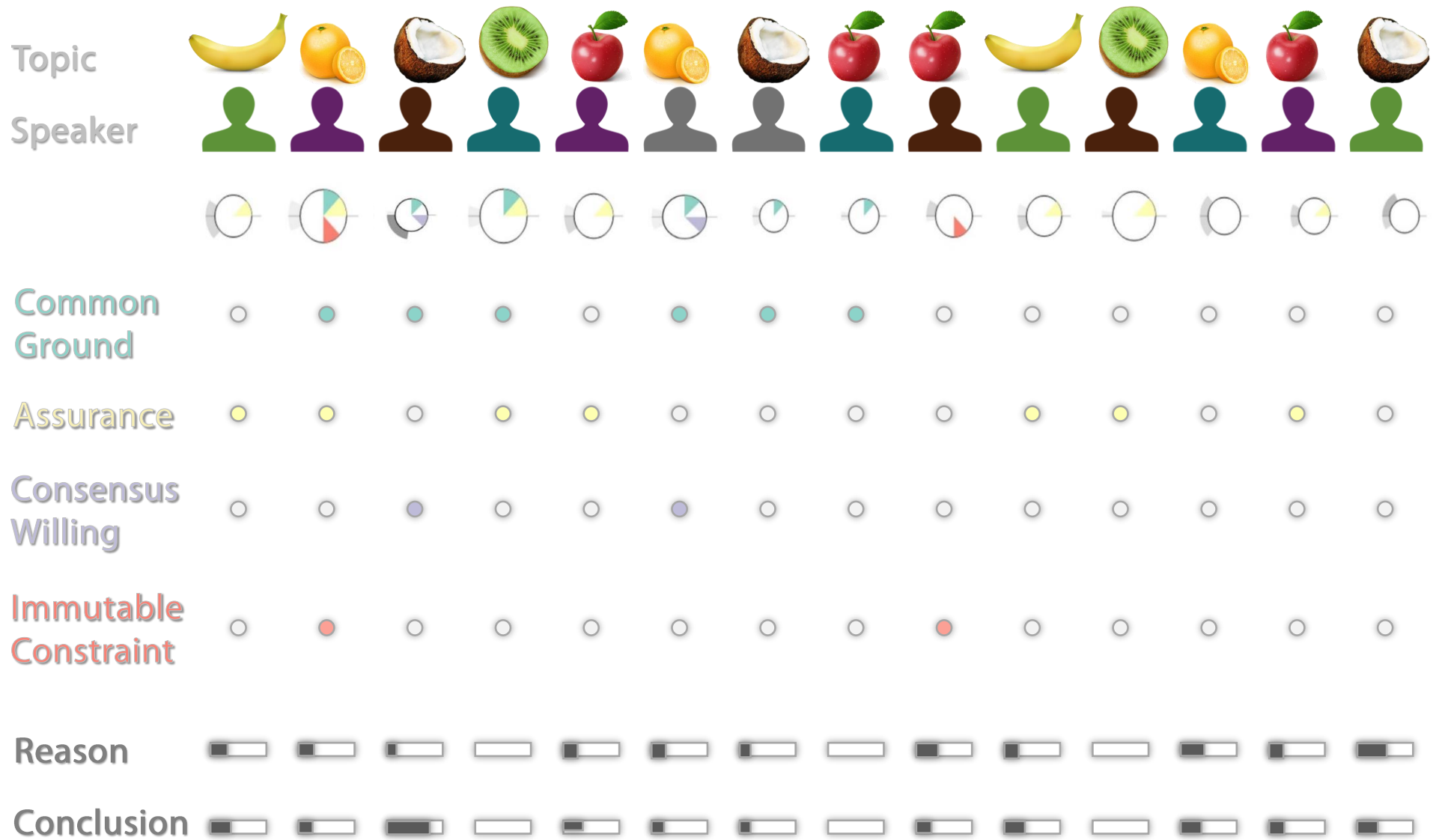
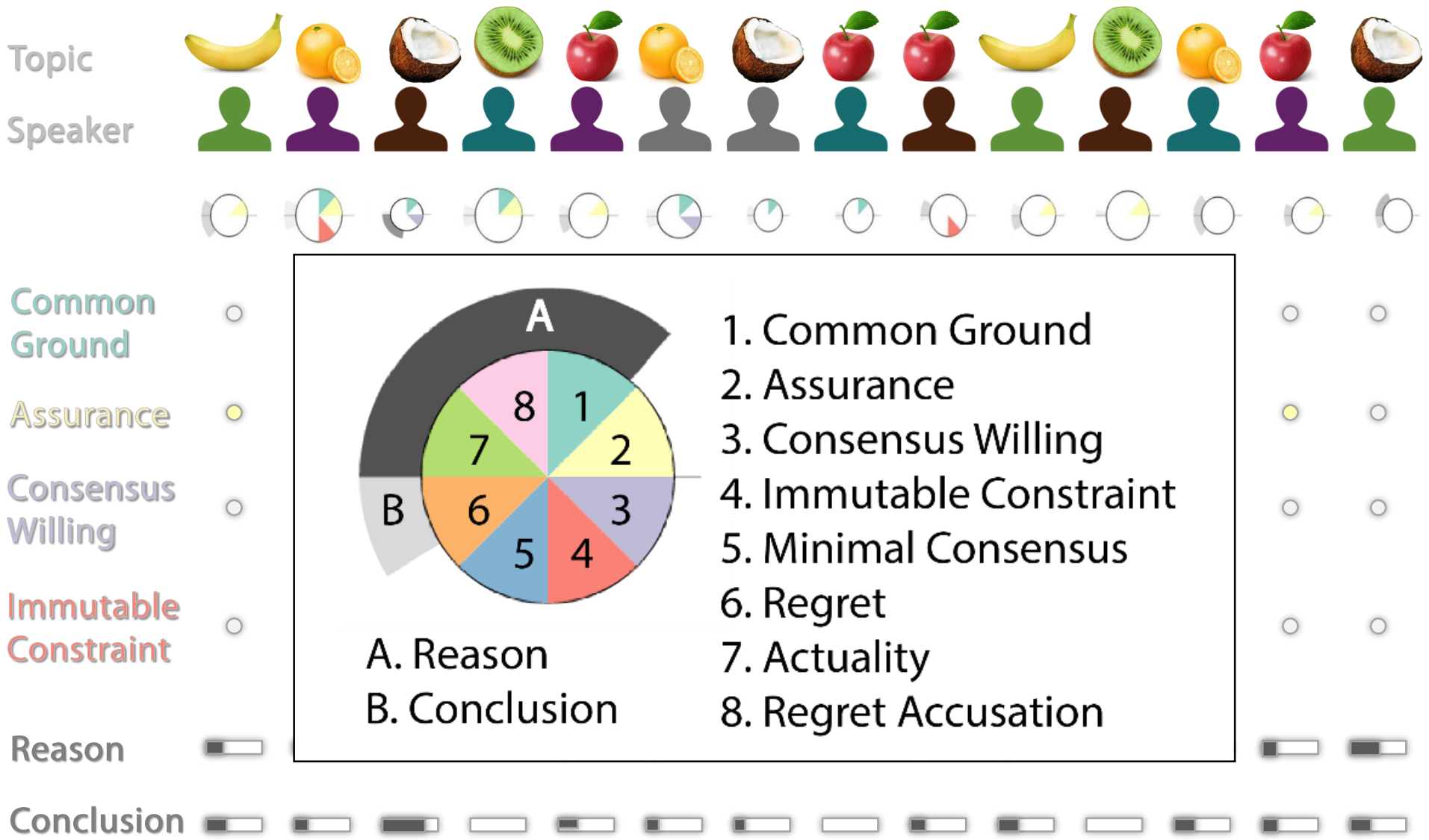
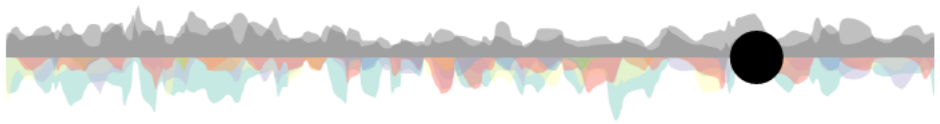

Topic
Speaker
Common Ground
Assurance
Consensus Willing
Immutable Constraint
Reason
Conclusion

Argumentation Glyphs



Argumentation Glyphs



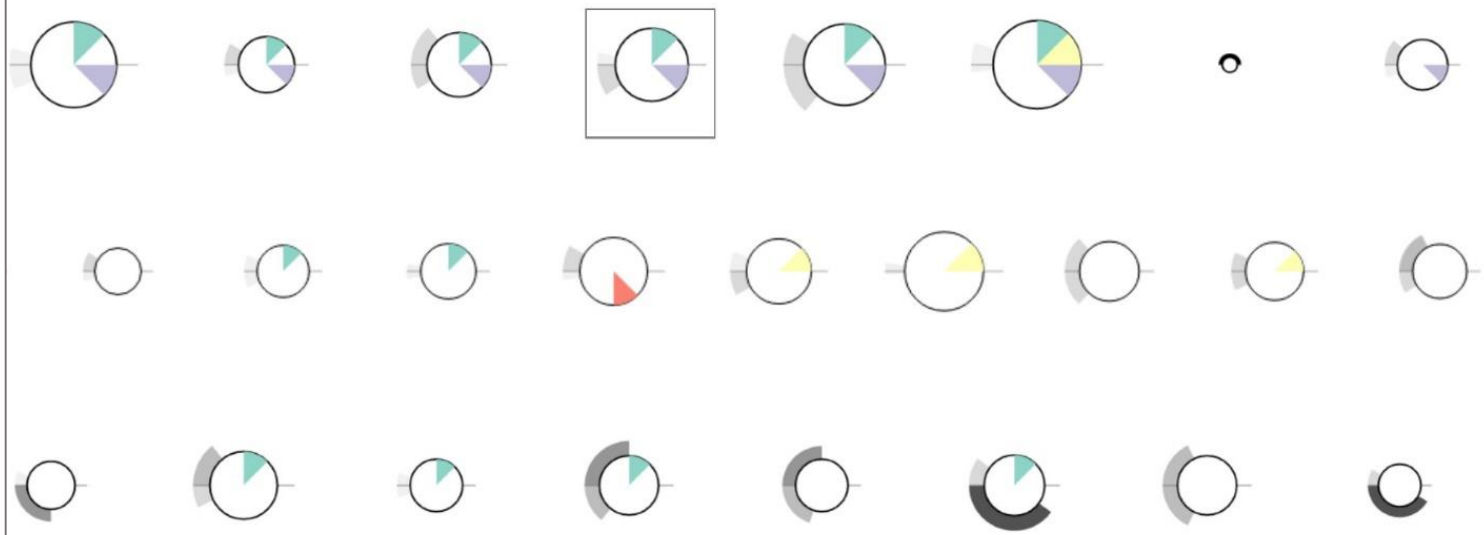
Dr. Heiner Geißler

[Vielen_Dank .]
[Also die Sache haben wir übrigens gestern Abend miteinander beredet nicht und es war klar nicht_wahr hier Gegenstand einer Schlichtung kann nicht sein BAST mit allen Ergänzungen Zusatz Mitteilungen und Verordnungen die von 2002 bis 2010 dann entwickelt worden sind weil das ja rein zufällig ist nicht wahr .]
[Wenn das in der Öffentlichkeit steht dann hat ja jeder die Möglichkeit punktuell situativ irgendwelche Informationen herauszuholen und stellt die dann dar als ob das der aktuelle Stand wäre .]
[Es ist so ein dickes Buch .]
[Wir können das in der Schlichtung einfach so nicht behandeln .]
[Das haben wir gestern Abend miteinander beredet und haben gesagt die Frage die uns interessiert die focussieren wir die konzentrieren wir nicht wahr auf die Frage die Herr_Conradi formuliert hat nämlich wie verhält es sich mit dem Tippfehler mit Euro und D_Mark .]
[So jetzt Frau_Dahlbender .]

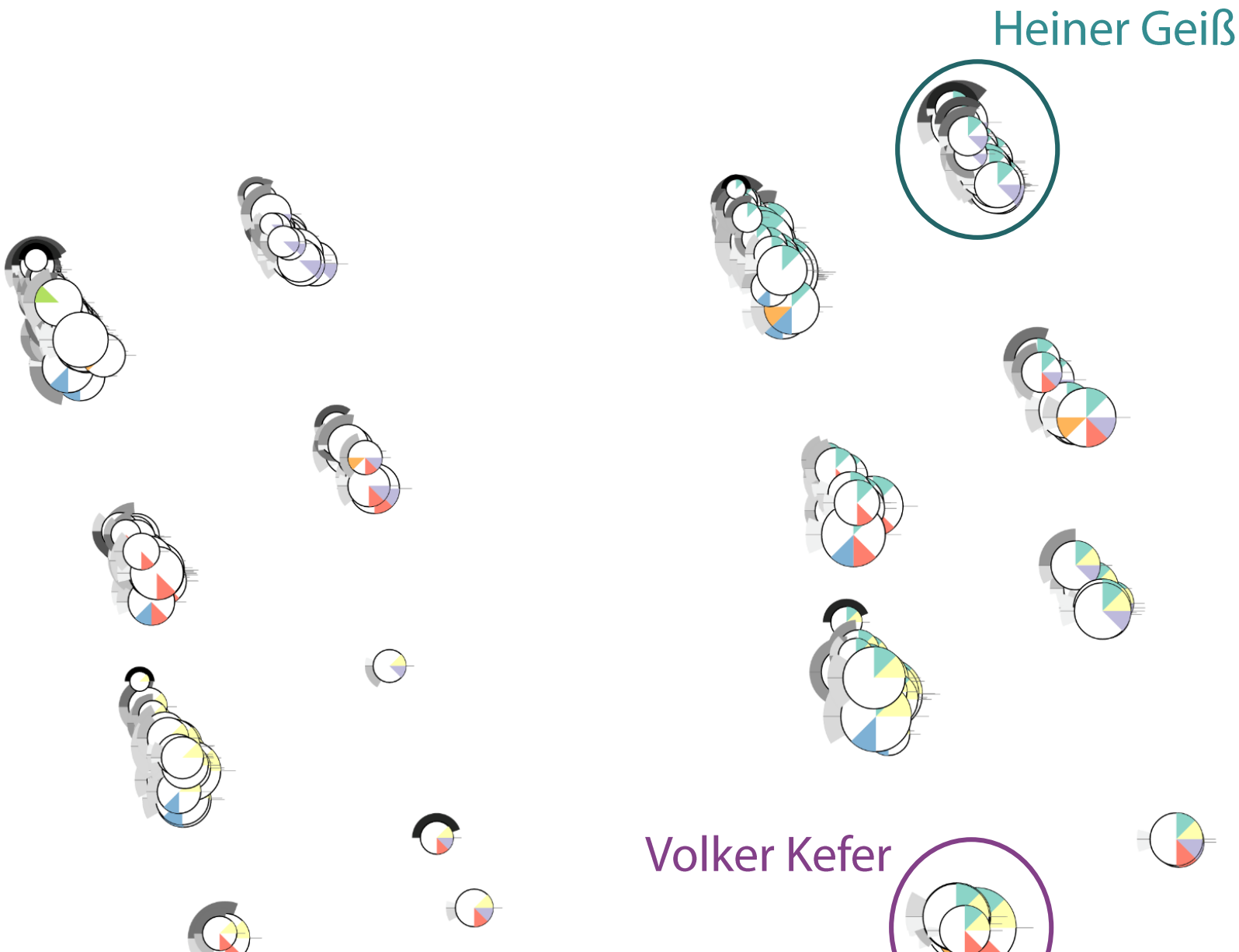
Reason

Conclusion

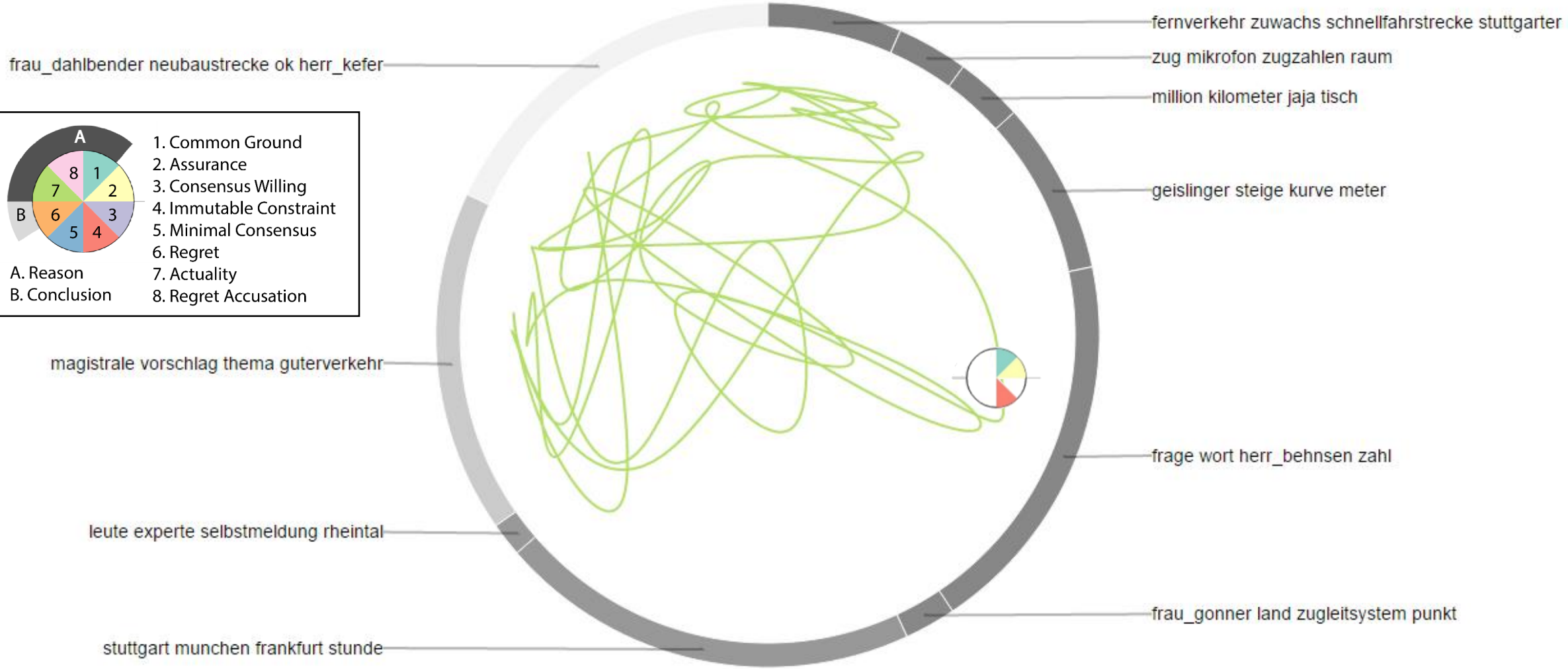
Common Ground
Assurance
Consensus Willing
Immutable Constraint
Minimal Consensus
Regret
Actuality
Regret Accusation



Argumentation Glyphs – Clustered View



Argumentation Glyphs – Volker Kefer



Evaluation – Expert Case Study

- Two political science experts studying deliberative democracy
- Observational study using think-aloud-method
- Two real-world debates
  - Presidential Election Debate (Obama-Romney 2012)
  - Project Mediation Debate (Stuttgart 21)
- Verifying eight hypothesis about the conversation dynamics

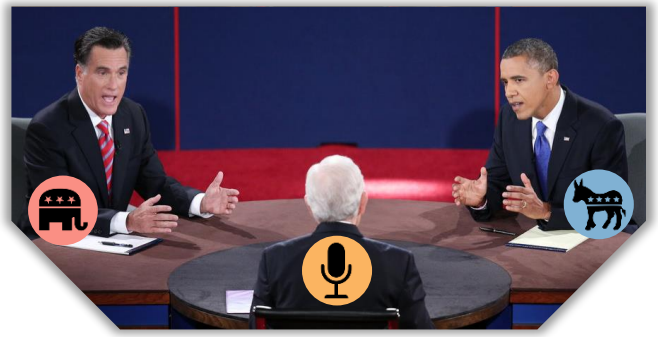
"The debate starts with **small focused discussions** and presentations with a smaller number of speakers and then the discussion floor is **opened for a broader debate** with all participants."

"Each group of participants [political party] would want to **push their own topics**."

"Dr. Geißler [moderator] is steering the conversation through an **active moderation style** and will be often **participating in non-moderational topics** and thus **contribute to the content** of the conversation. "

"The utterances of the **moderator** will be characterized by linguistic particles **establishing a common ground** between the counterparts."

Dr. Heiner Geißler



Romney vs. Obama

"The **moderator** might not only be **passive**, but **unheard** on several occasions."

"Throughout the debate, **Obama** takes a **defensive** role in contrast to **Romney**, who is more **offensive**."

Expert Feedback and Conclusion

- The conversation floor metaphor **preserved the mental model** of our users.
- All **levels of detail** provided by the tool were used during the analysis.
- Both experts appreciated the ability to **dig deeper** for more information during the analysis.
- Both experts found **new patterns and outliers.**
- The topic glyphs were helpful to **understand the positioning of points** in the space.
- The argumentation glyphs were used to **identify speech and argumentation patterns.**
- Both experts agreed that the use of ConToVi has an **added value** to their research and saw **potential for future applications.**

Future Work

- Optimize the **topic labels** and their placement.
- Add a **speaker motion interaction** to navigate through time.
- Include a measurement of **direct speaker interactions.**

Contributions

- **Topic-Space Views** as an alternative to Theme-River-based visualizations for topic-based text exploration.
- Proposing design solutions for overcoming the known drawbacks of **radial layouts**.
- Integrating motion chart **trails** into the visualization to allow the animation to be more **tractable**.
- Using a **visual-sedimentation-based metaphor** for setting the animation into context of prior utterances.
- Abstraction of **speech and argumentation features** into tailored glyphs.

Universität Konstanz

Data Analysis and Visualization

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

vialab visualization for information analysis

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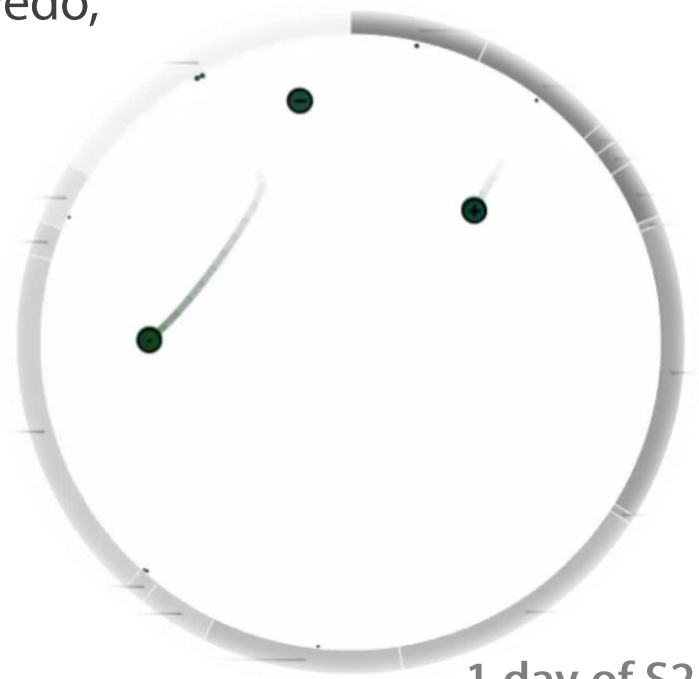

http://visargue.inf.uni.kn/
usr: demo
psw: $VisArgue$

…1 day of S21