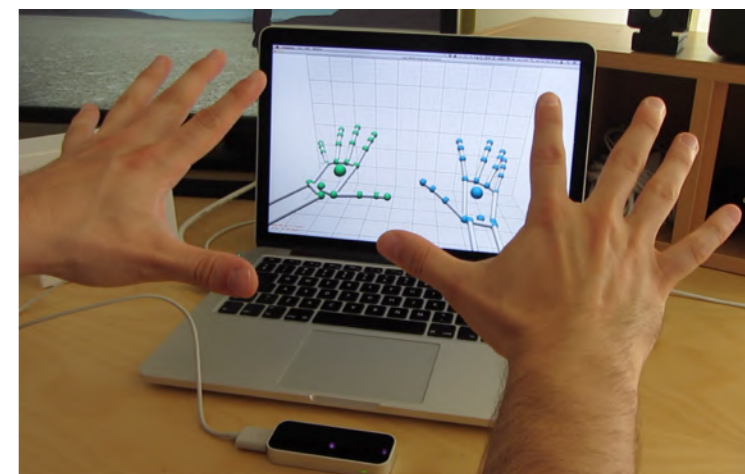
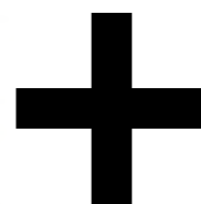


The Ninth International Conference on Advances in Computer-Human Interactions  
ACHI 2016

Change your Perspective: Exploration of a 3D Network created from  
Open Data in an Immersive Virtual Reality Environment

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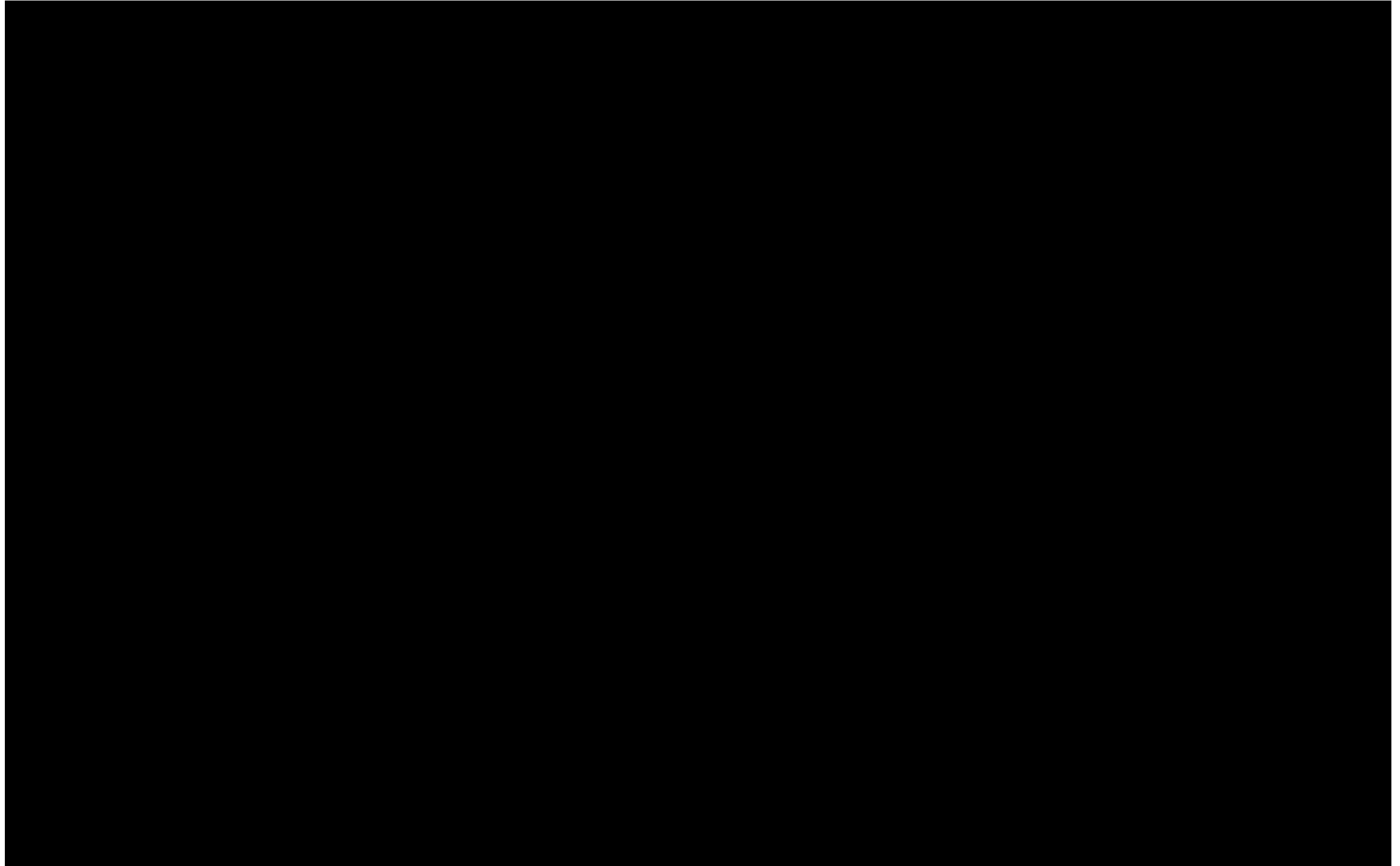


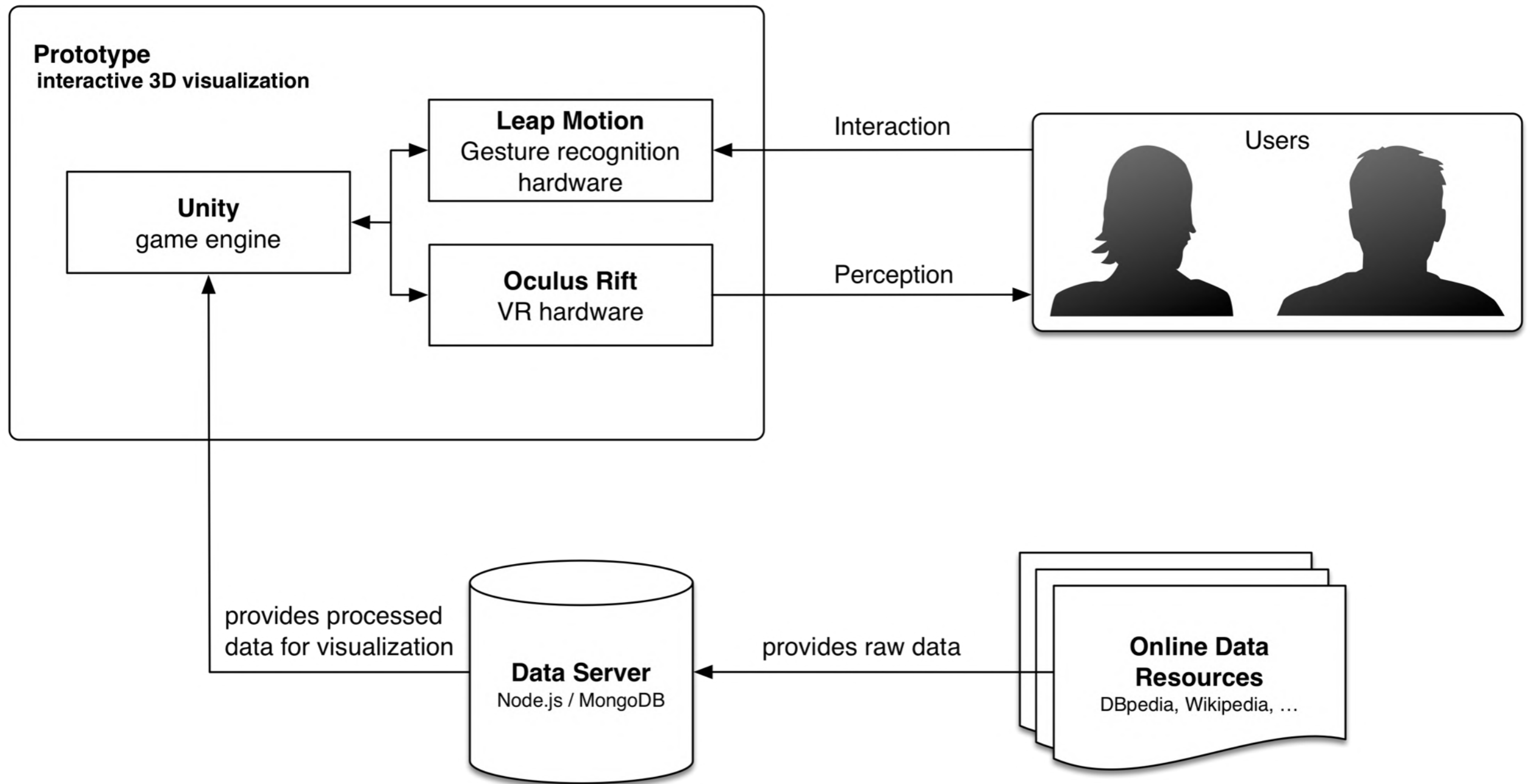
*Purpose:* Investigate

*Issue:* how to naturally **explore** and interact with

*Object:* open data content received from the web

*Viewpoint:* in an immersive virtual reality environment using a head-mounted display and vision-based motion controls.











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Task 1 named solutions	Count	Task 2 named solutions	Count
Vienna	1	Berlin	2
Budapest	1	<b>Kiev</b>	3
<b>Warsaw</b>	1	<b>Zagreb</b>	6
<b>Belgrade</b>	5	Madrid	0
Prague	1		
Wrong answer	2	Wrong answer	0
Correct answer	9 / 11	Correct answer	11 / 11

## **Content perception**

+ intuitive, pleasant, felt novel, overview

## **Spatial perception**

+ movement transition, understanding of own location

- deciding where to go next

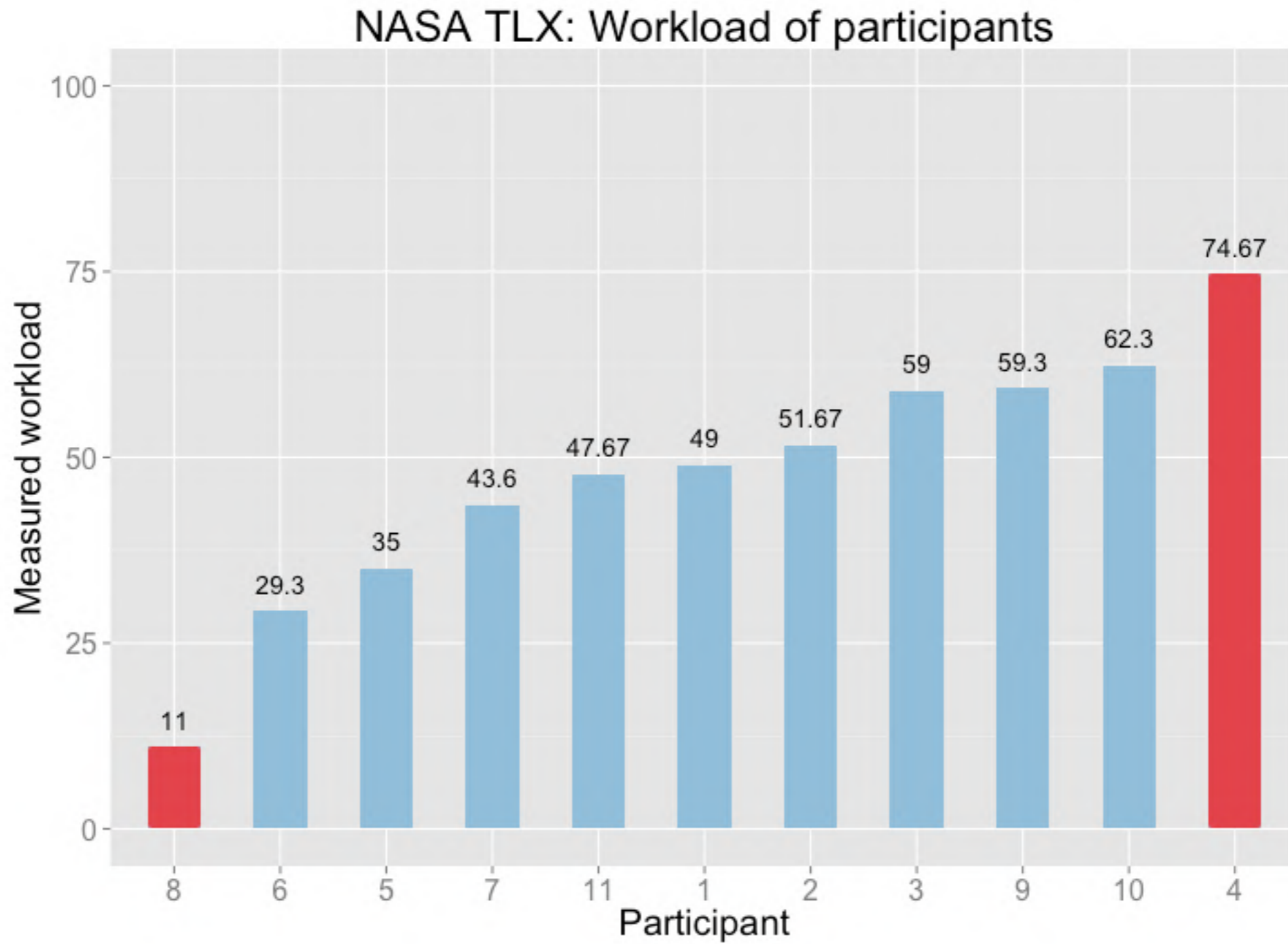


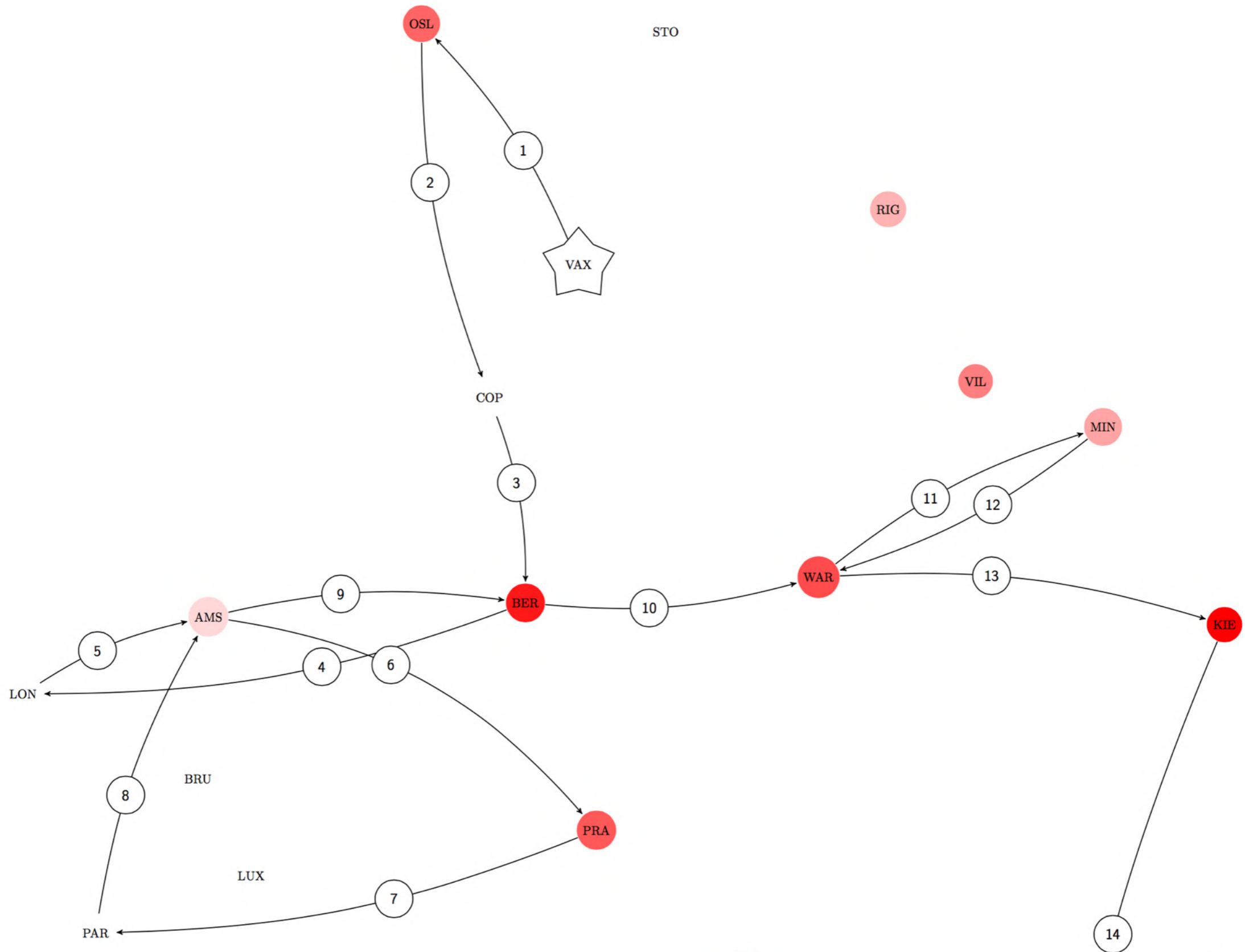
## **Interaction**

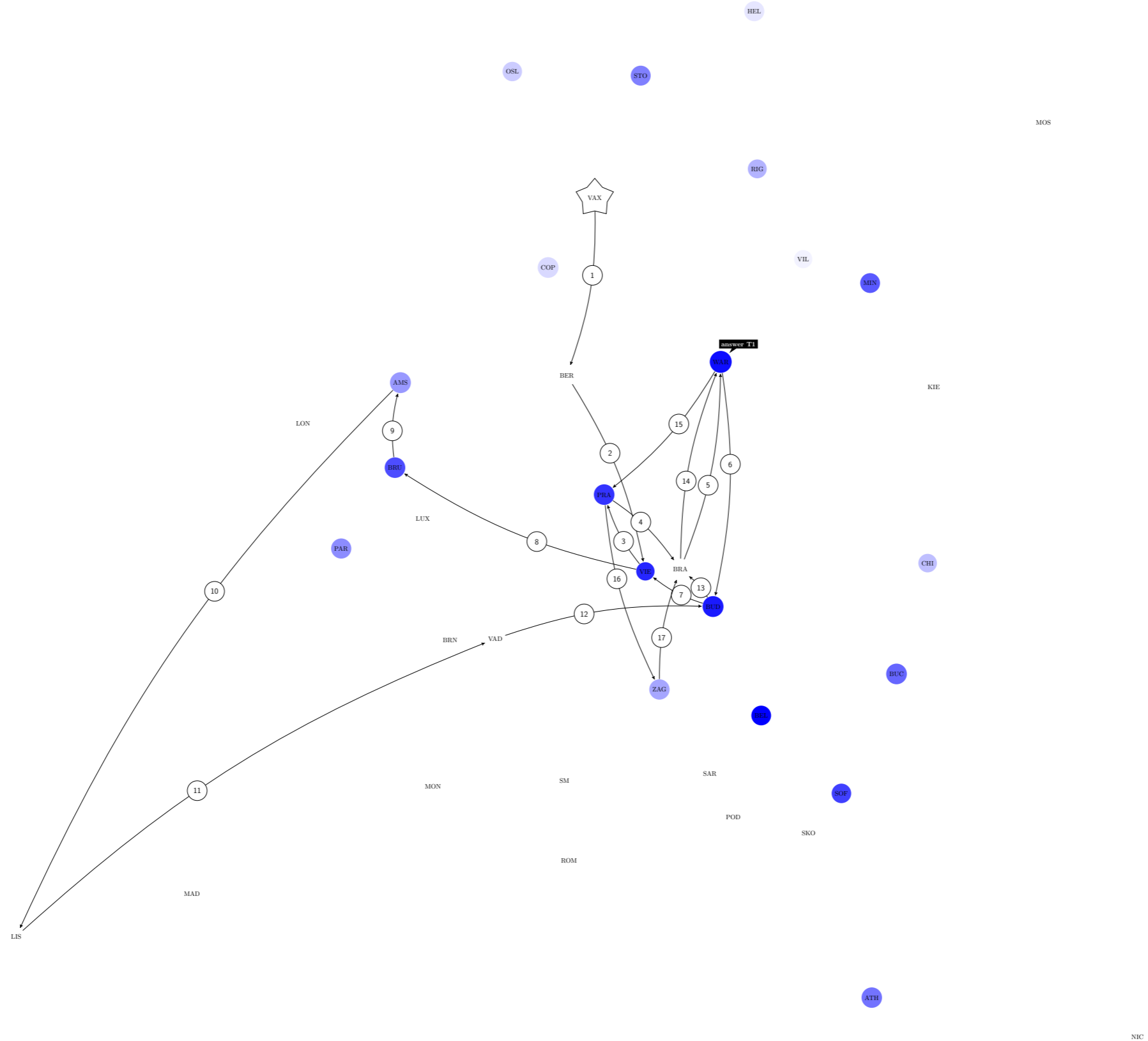
- + enjoyable and intuitive
- precise interaction not always possible

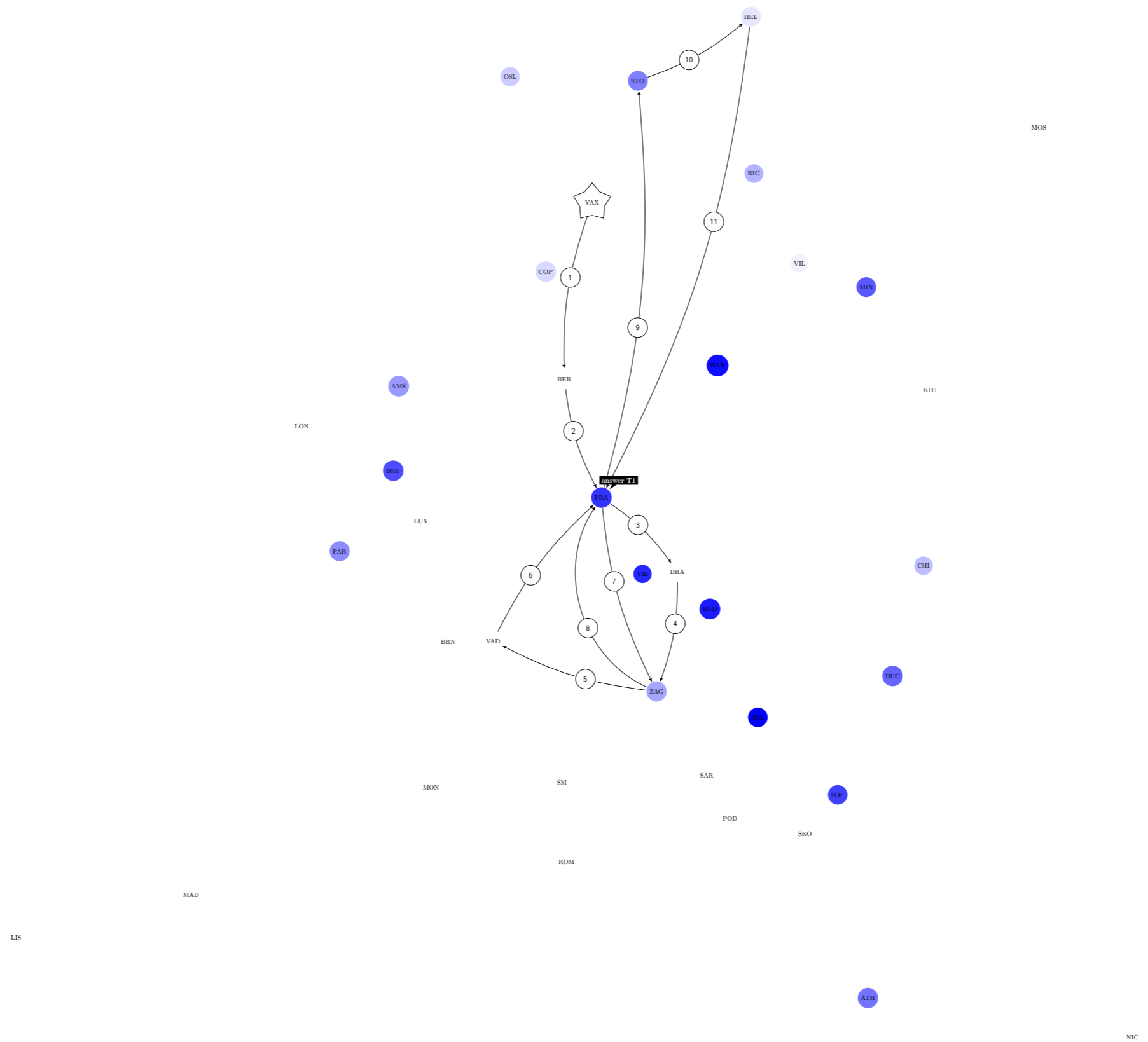
## **Human factors and ergonomics**

- + looking around while sitting in a swivel chair
- +/- exhaustion of hands/arms

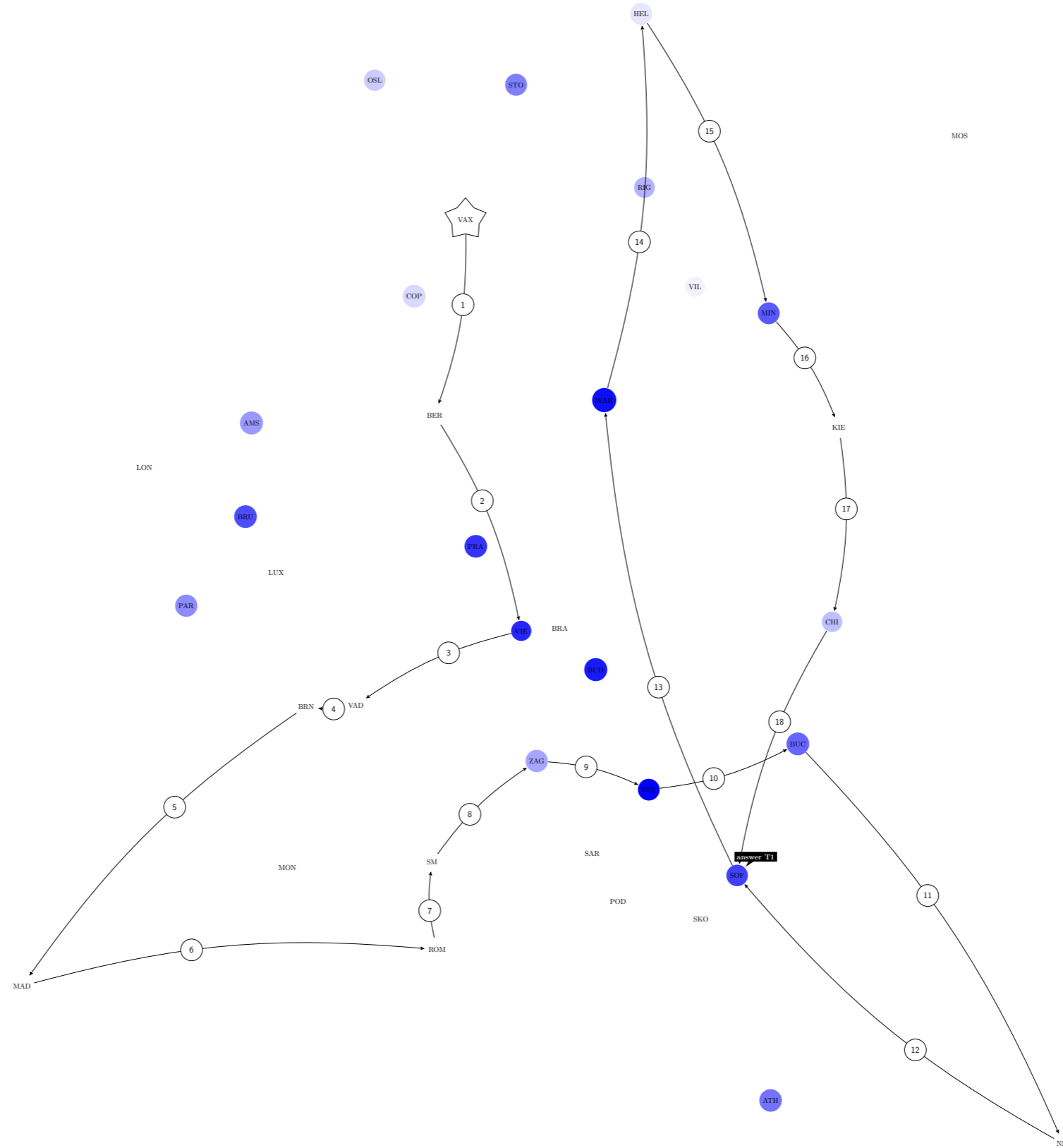


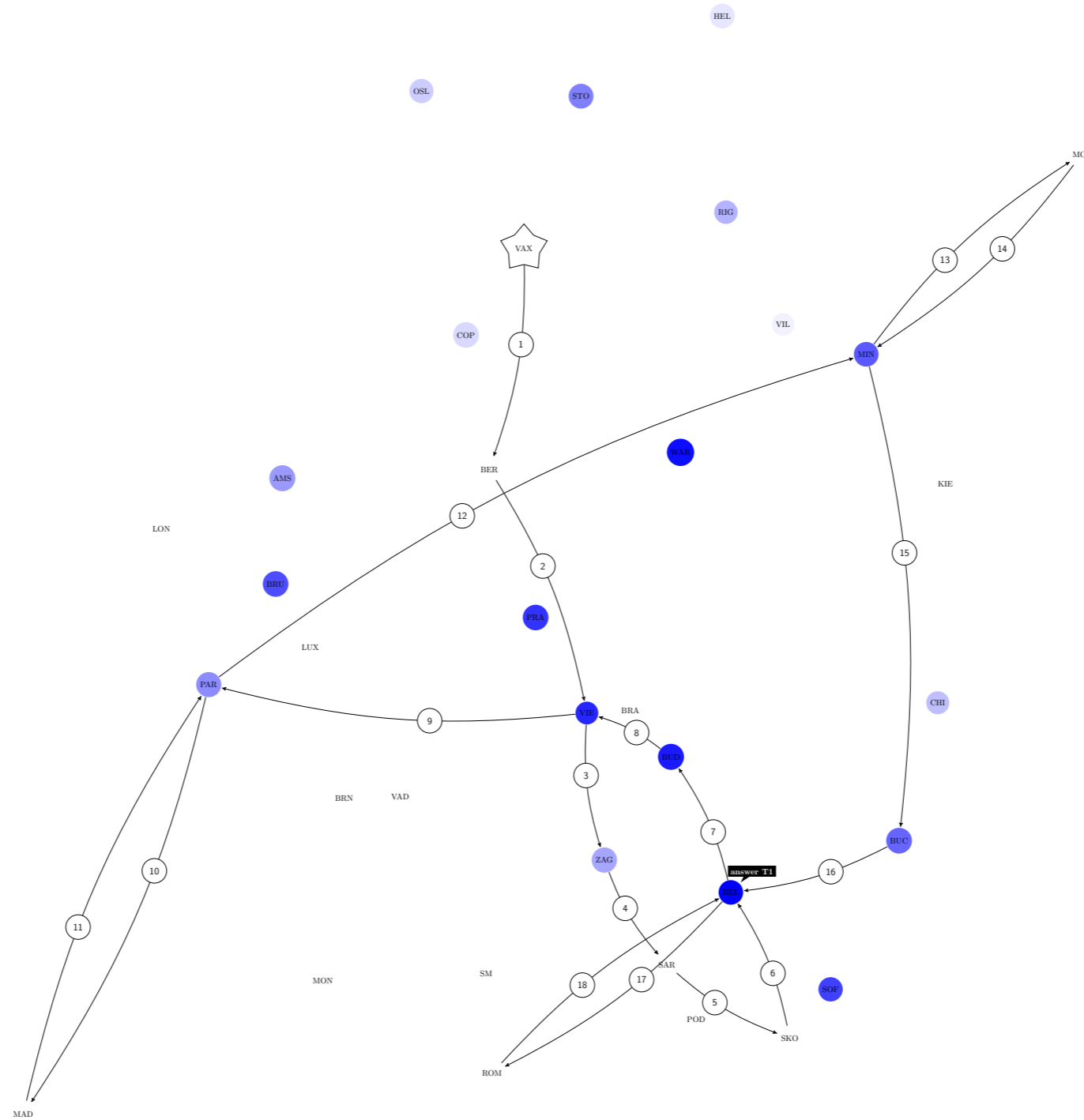


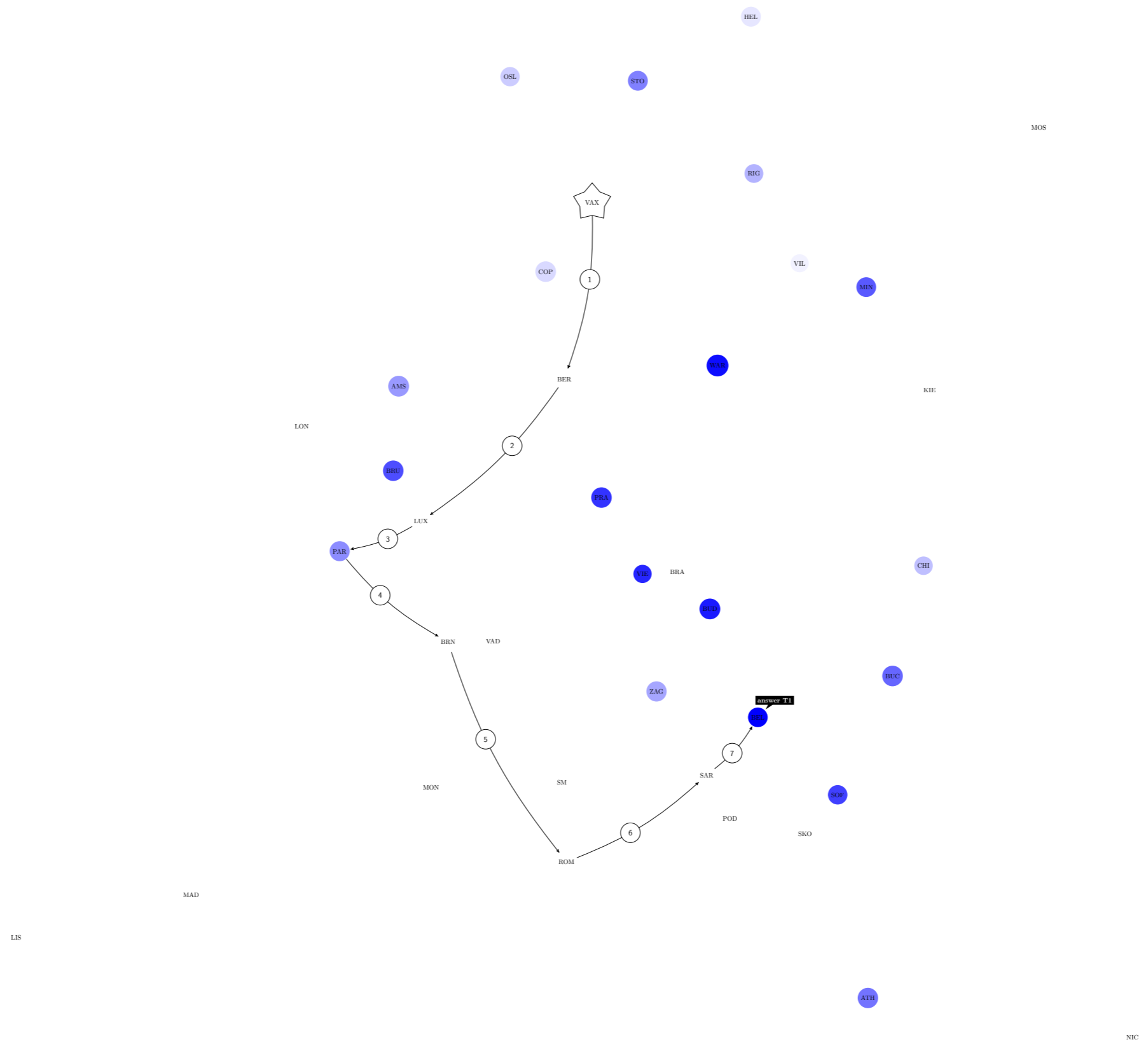


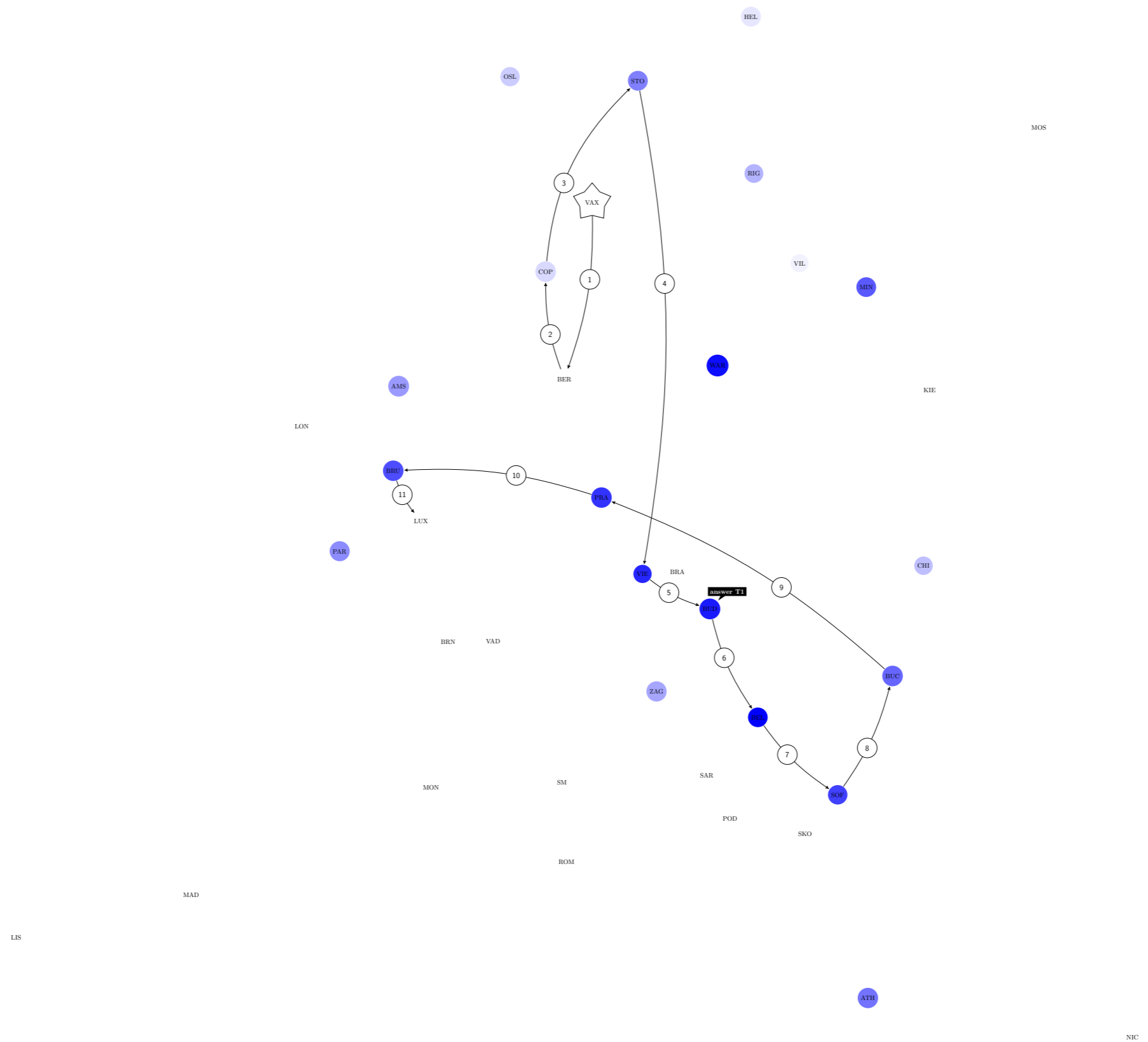


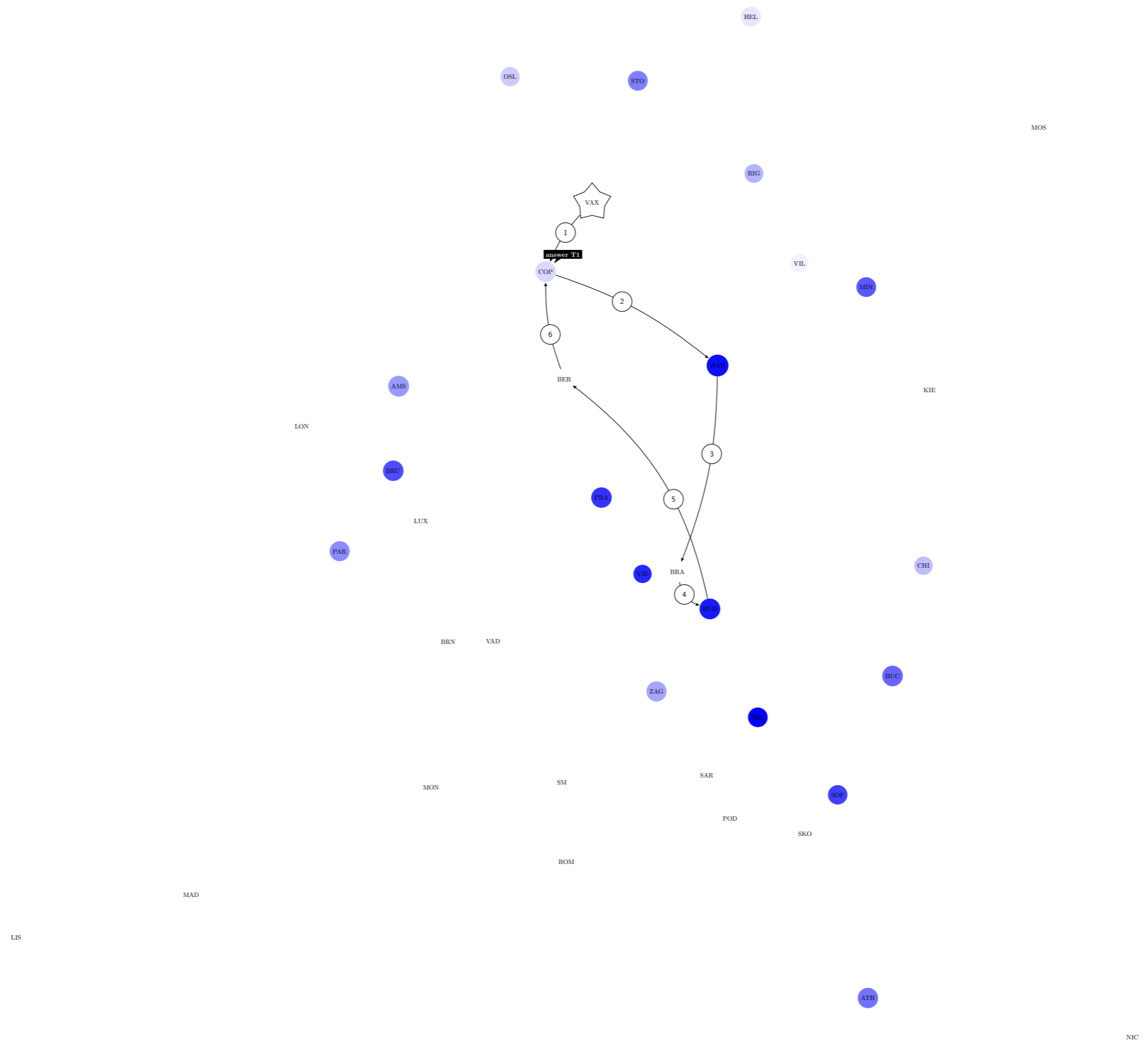




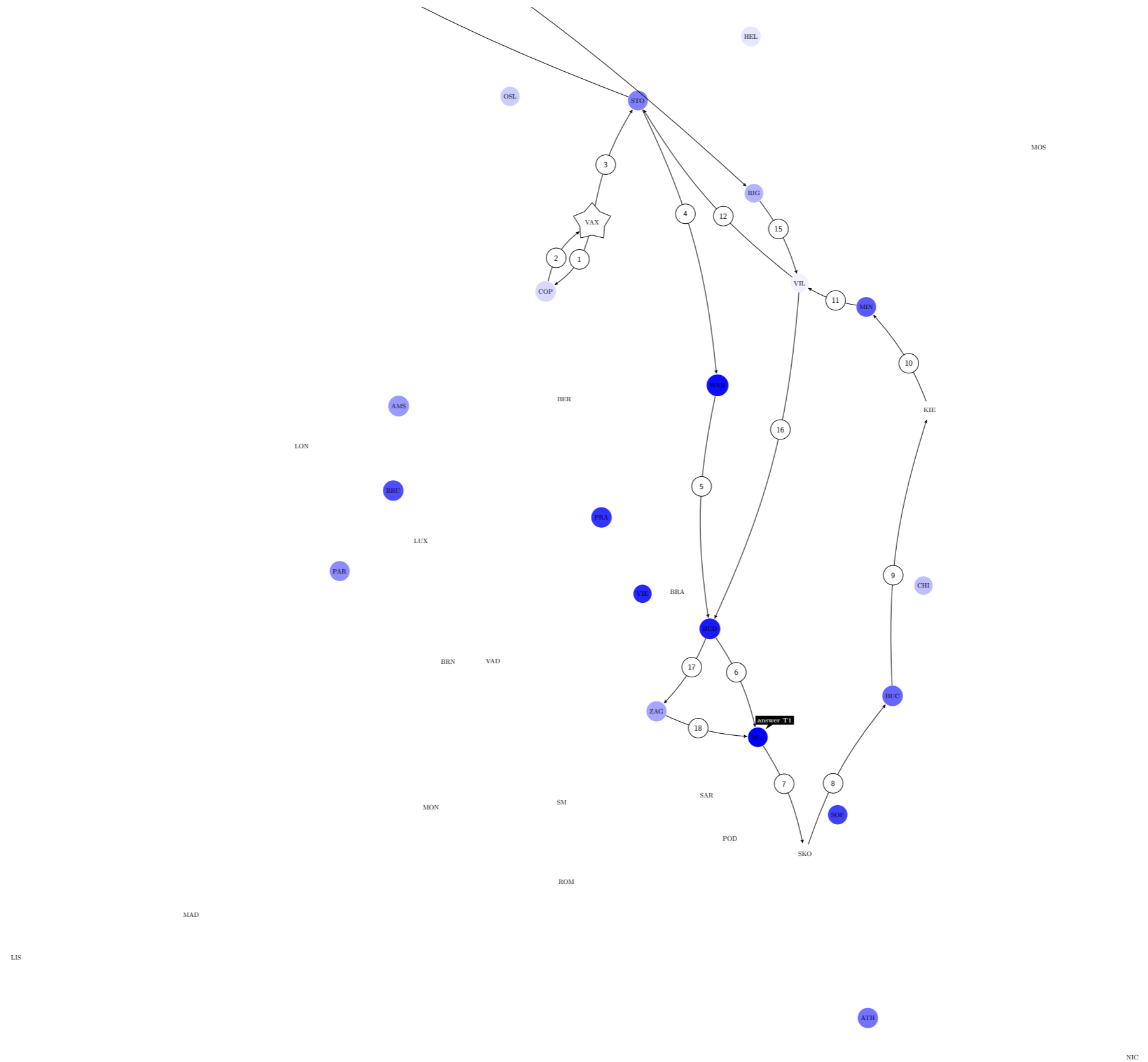


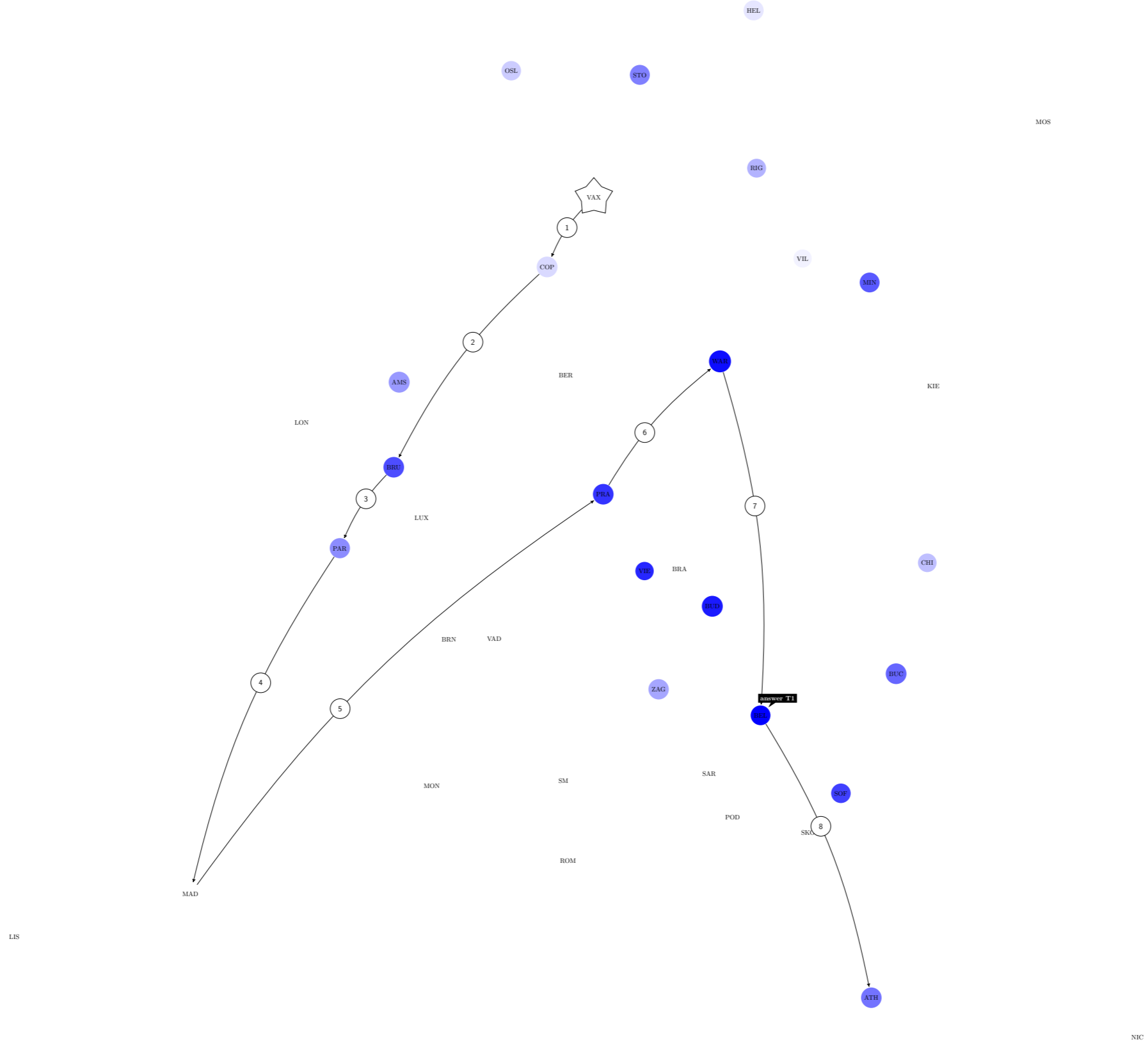


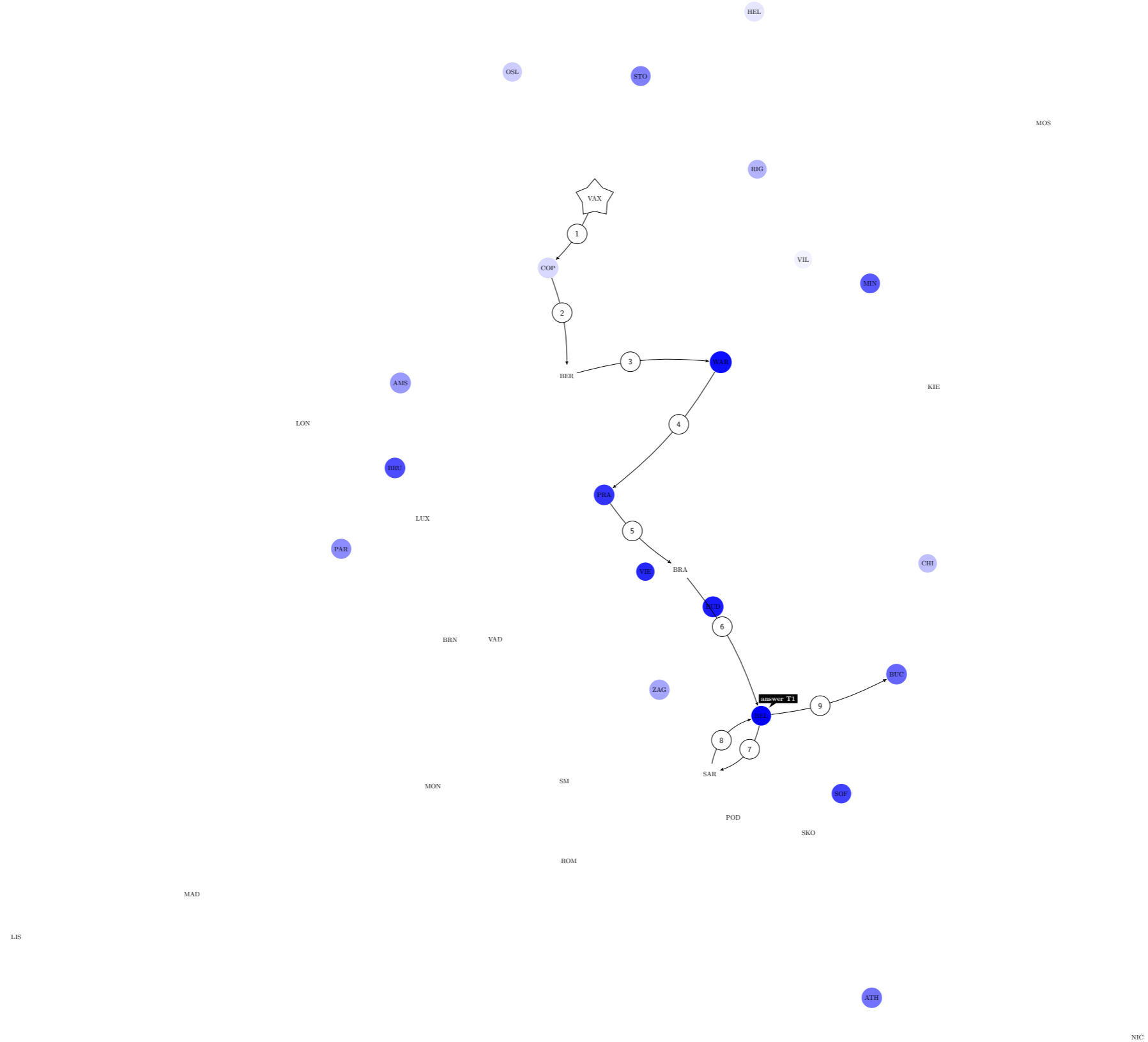


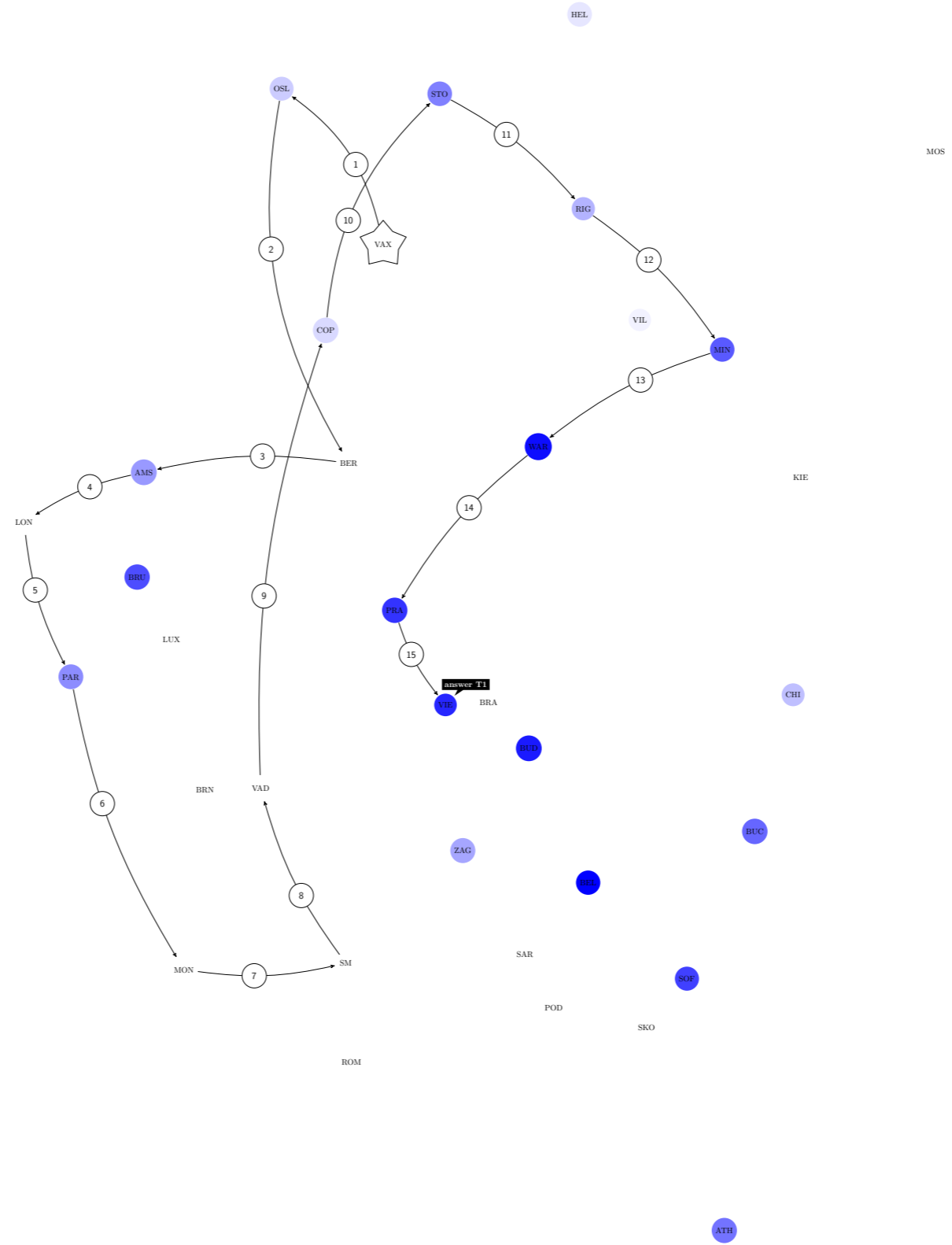


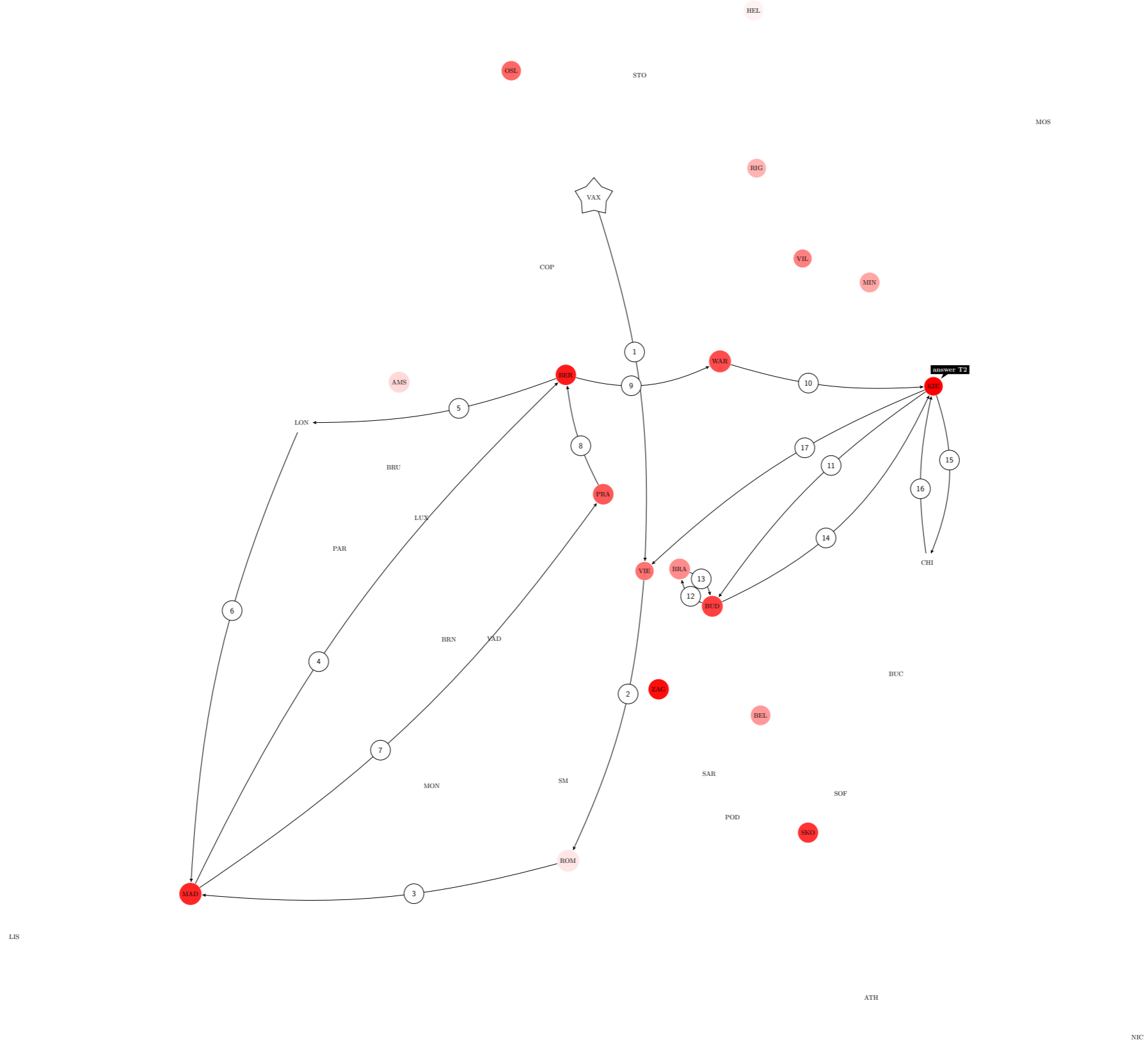




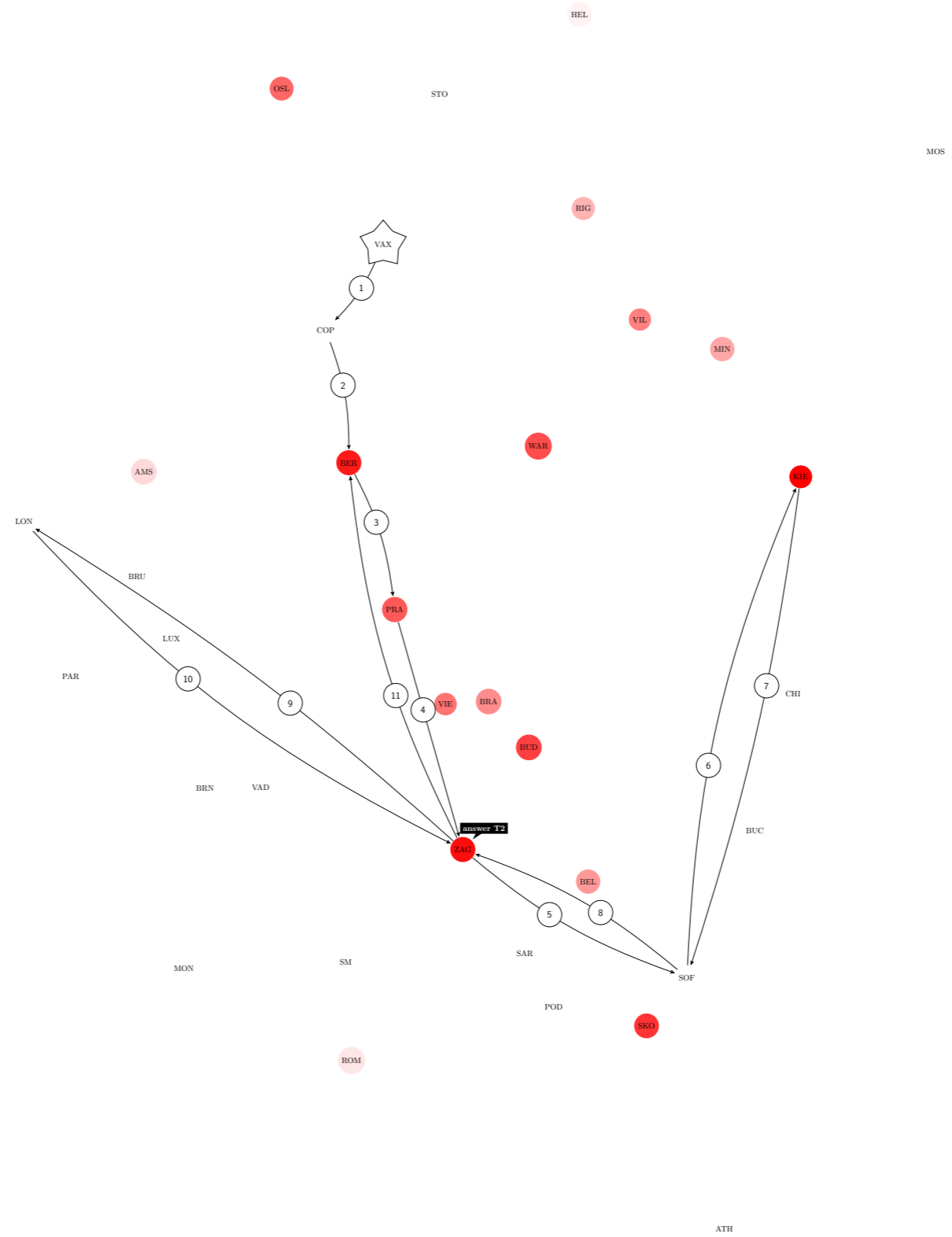


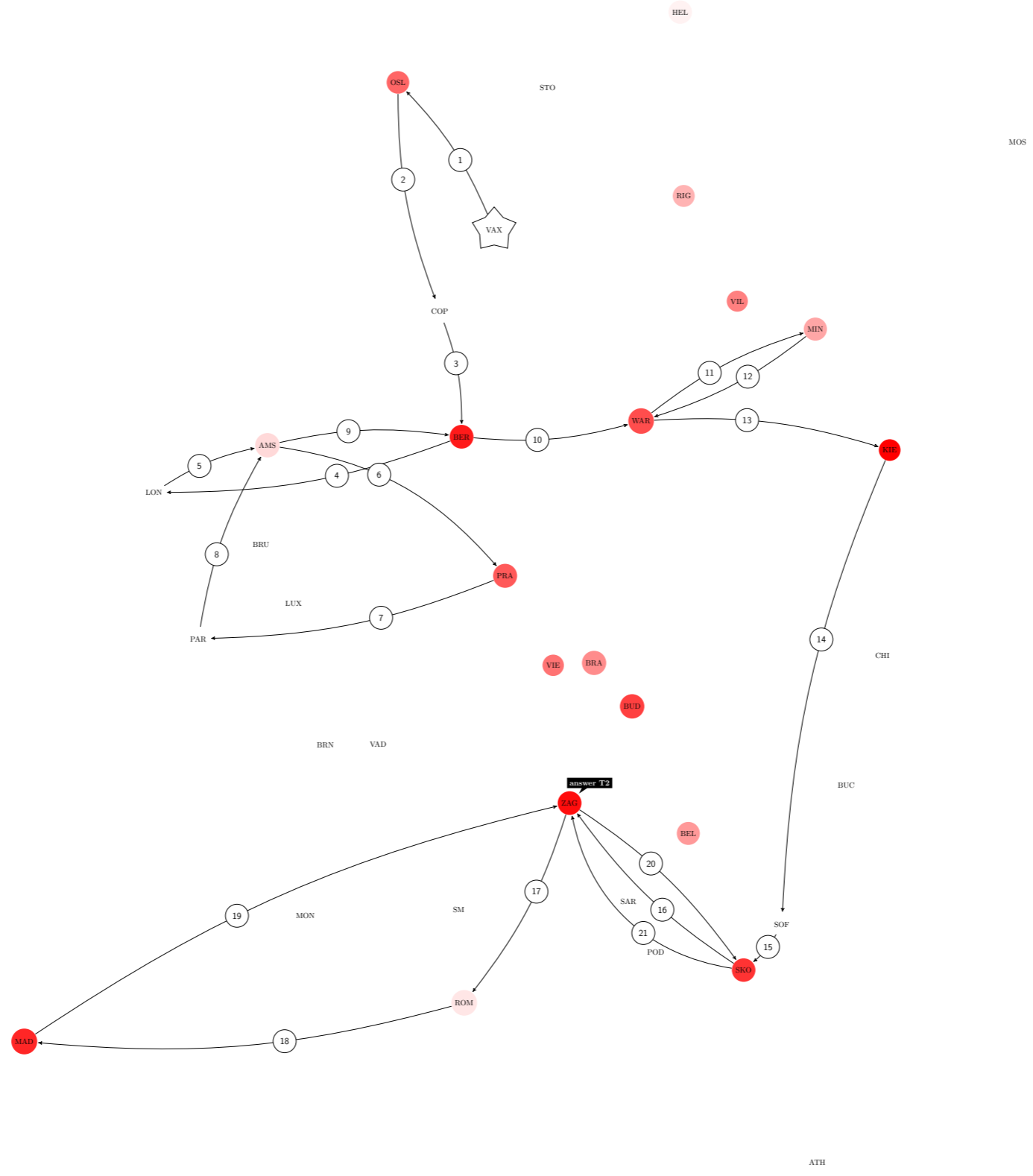


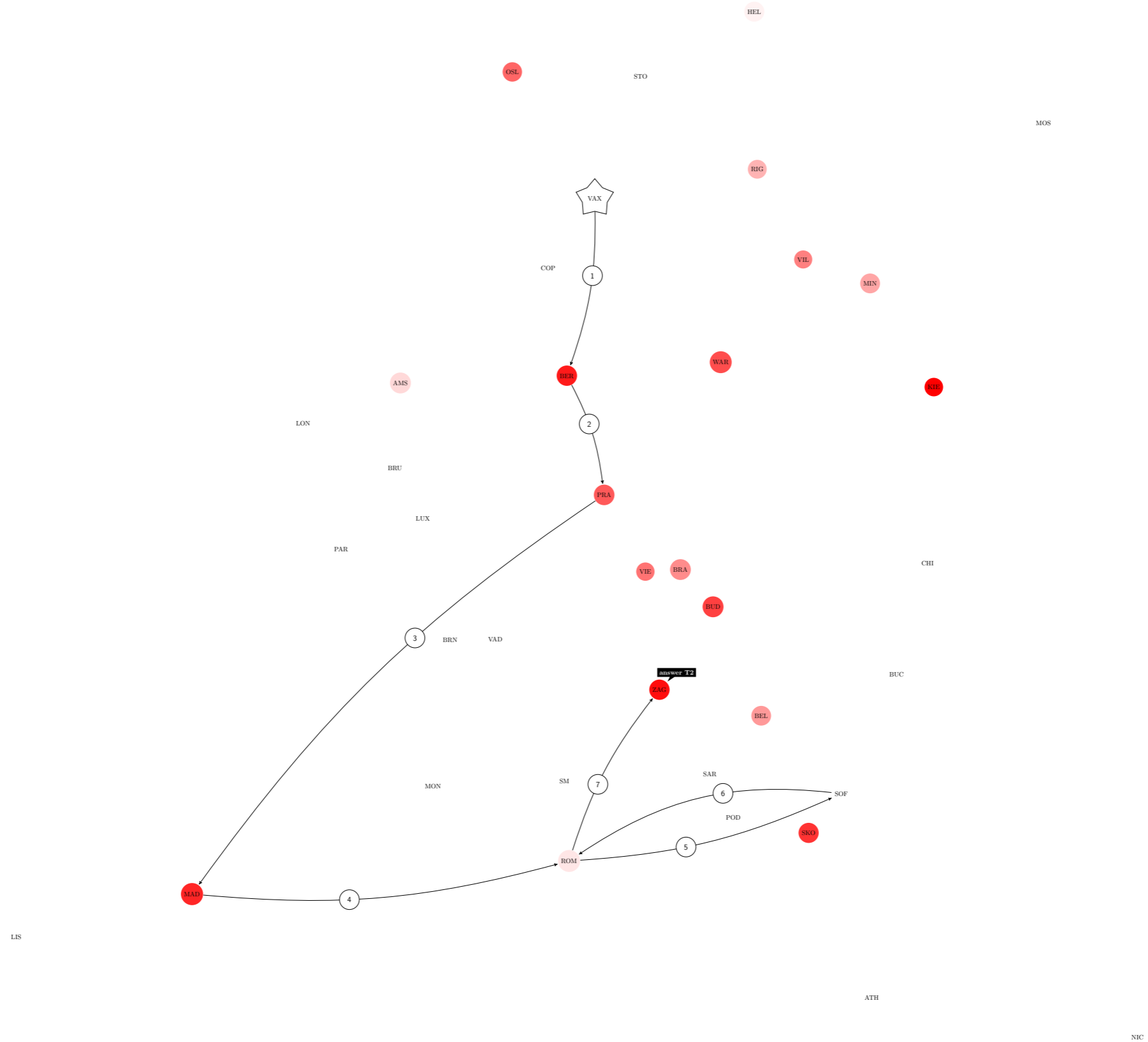


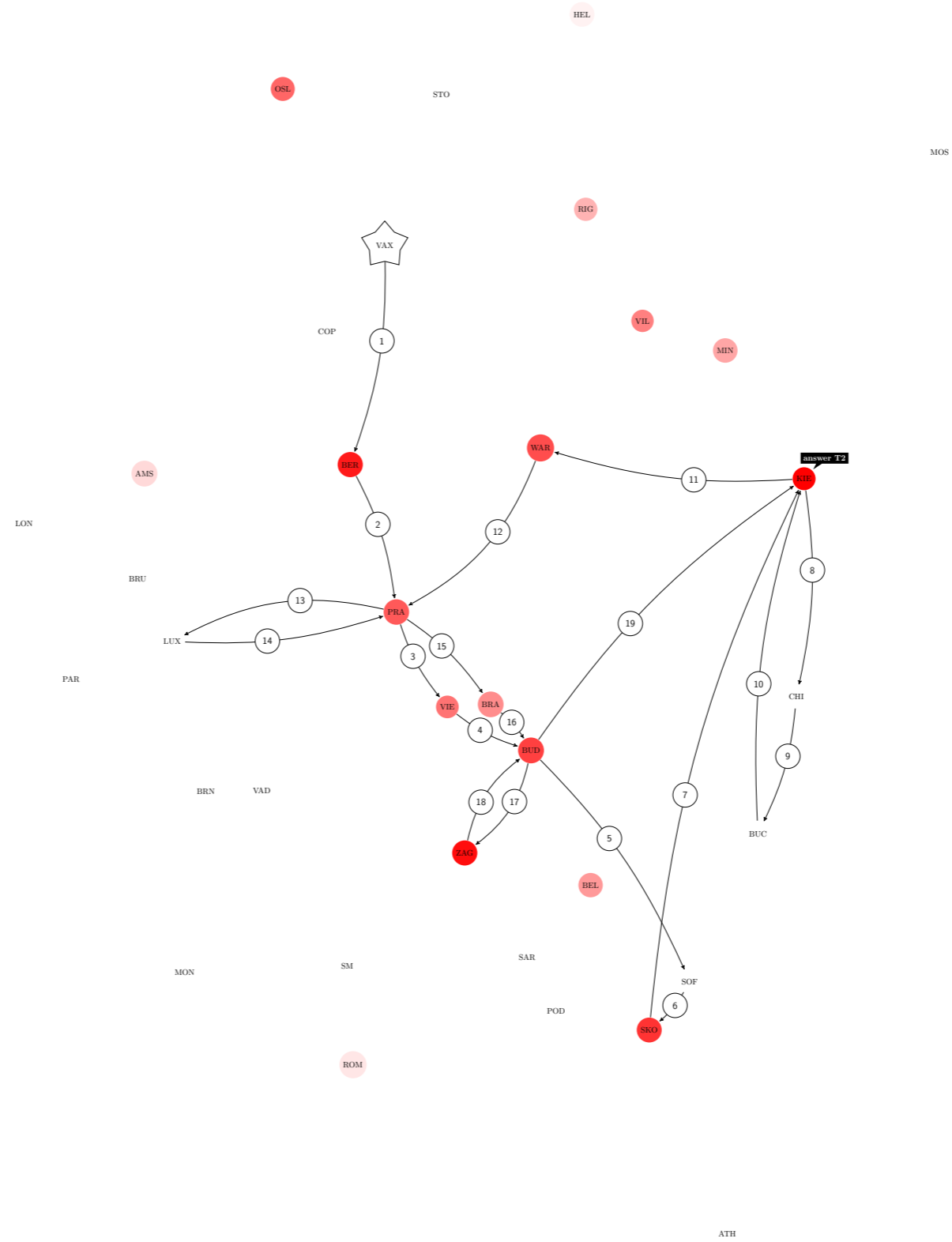


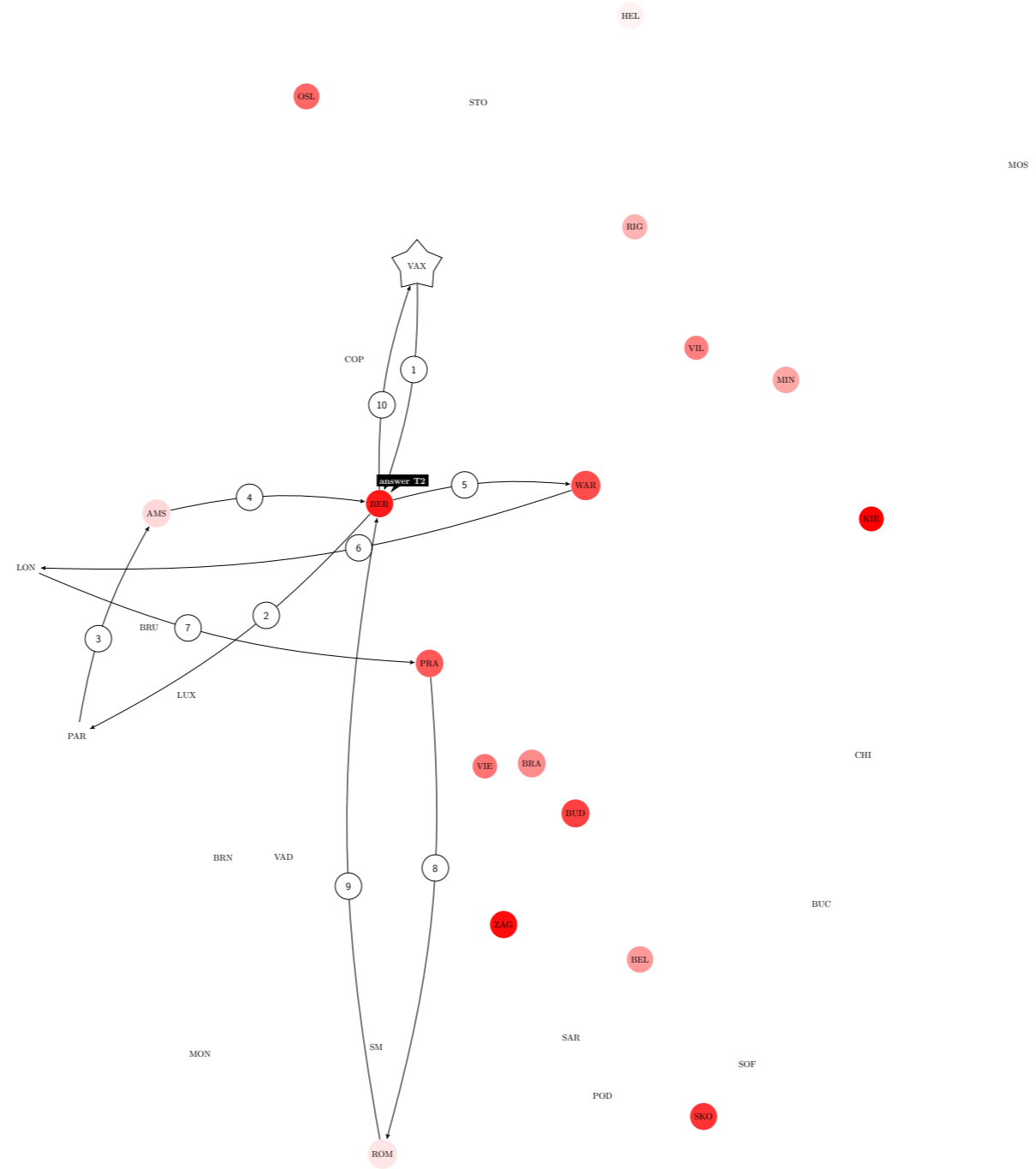










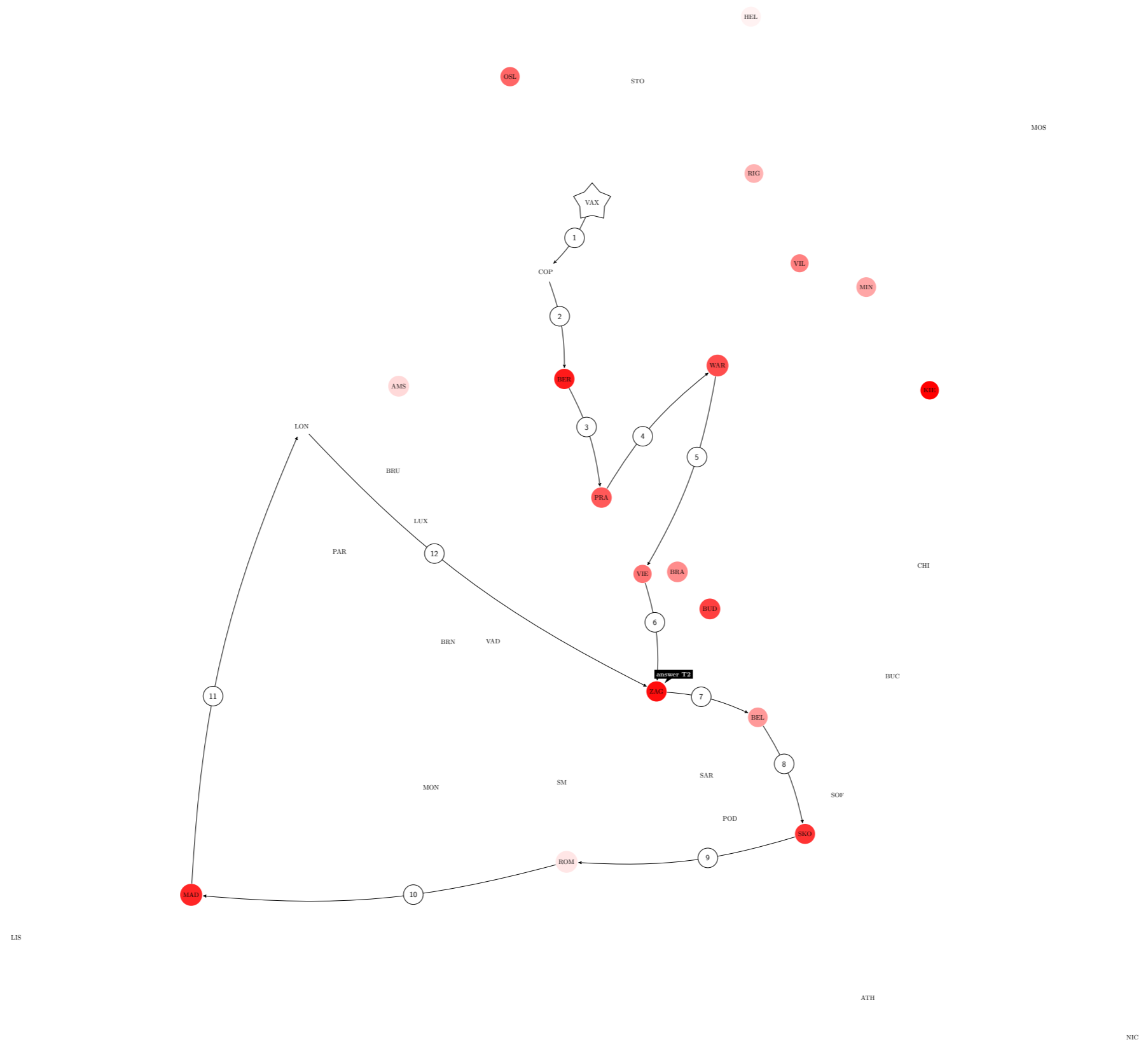


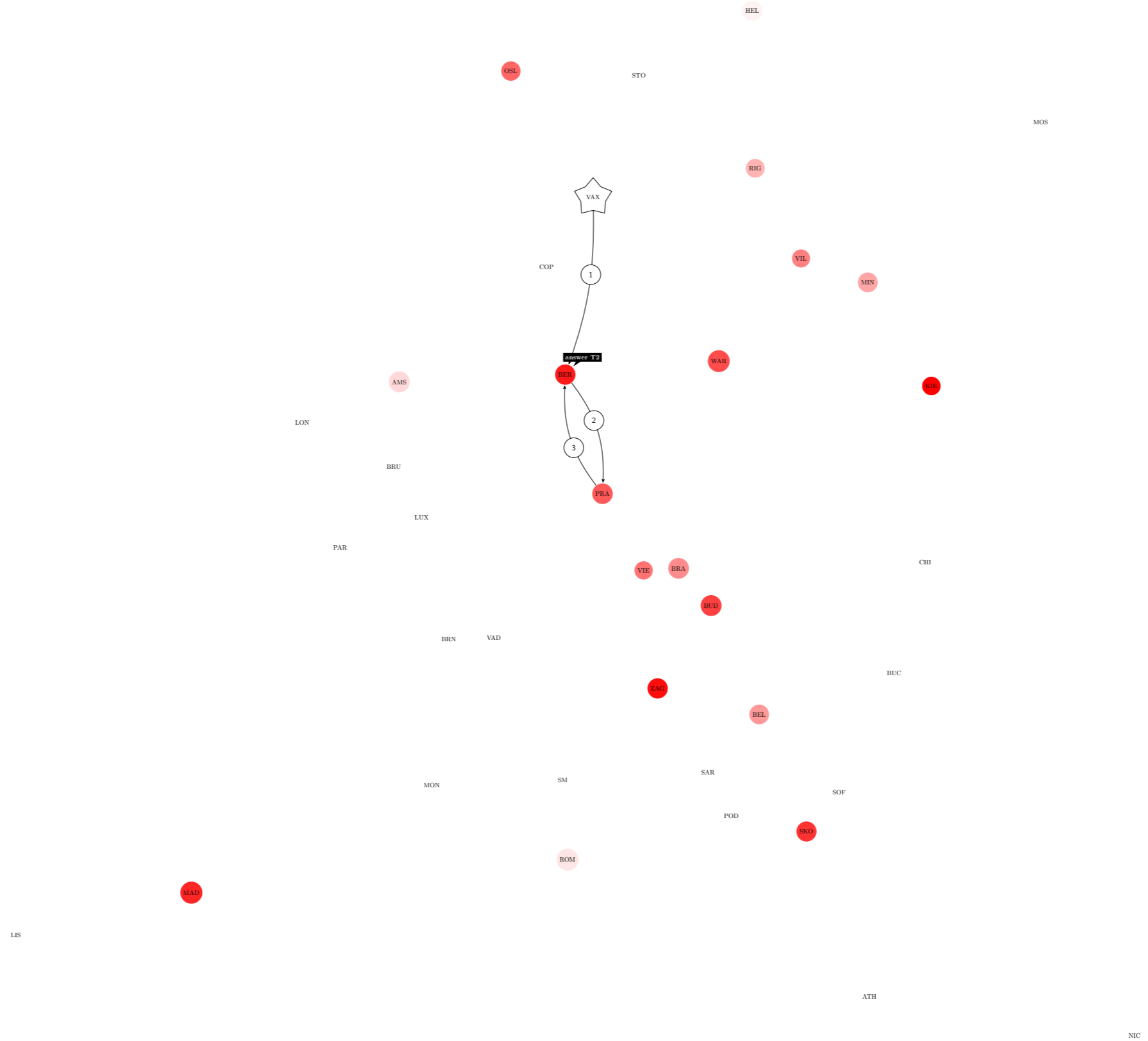
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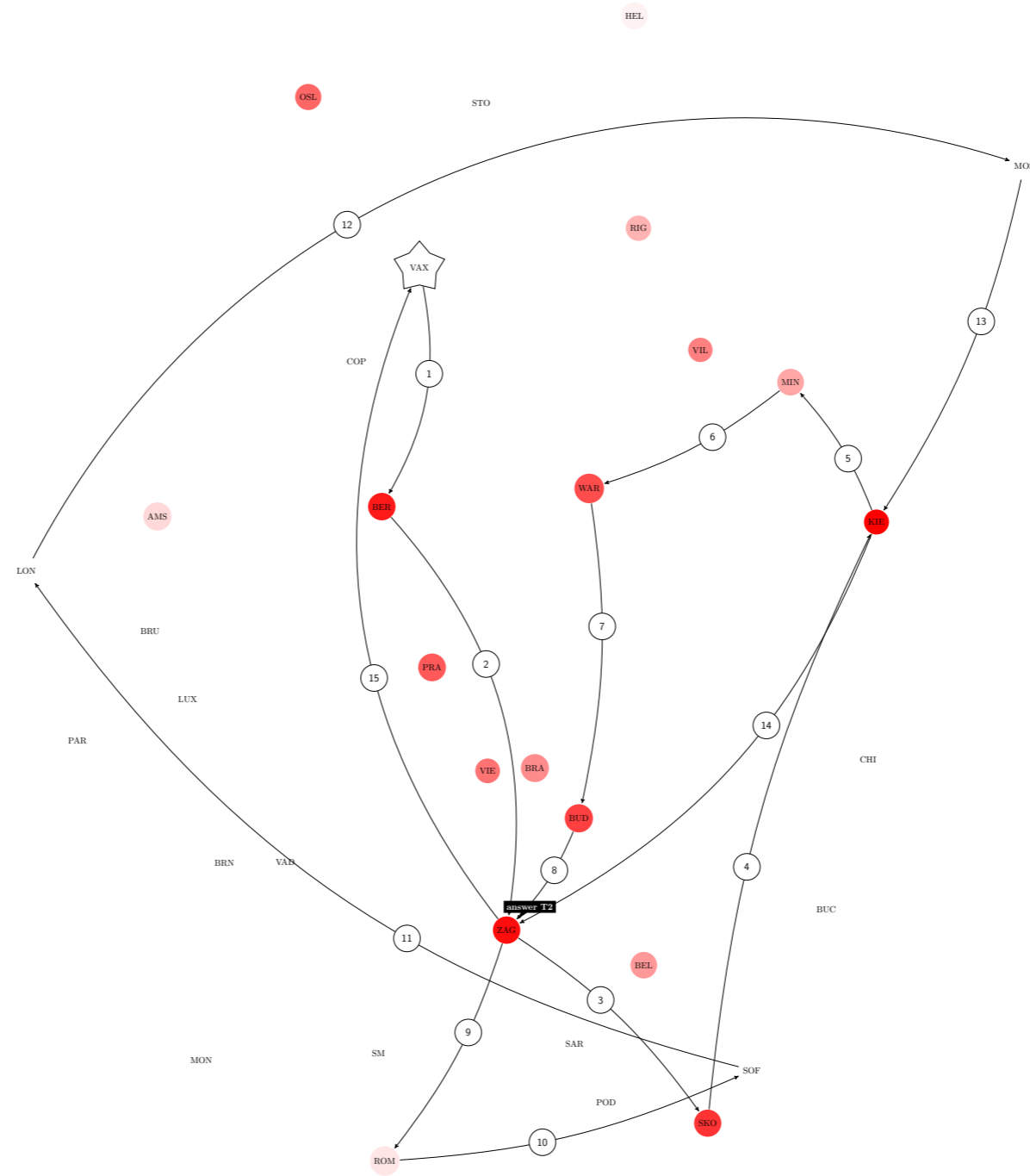
MAD

ATH

NIC





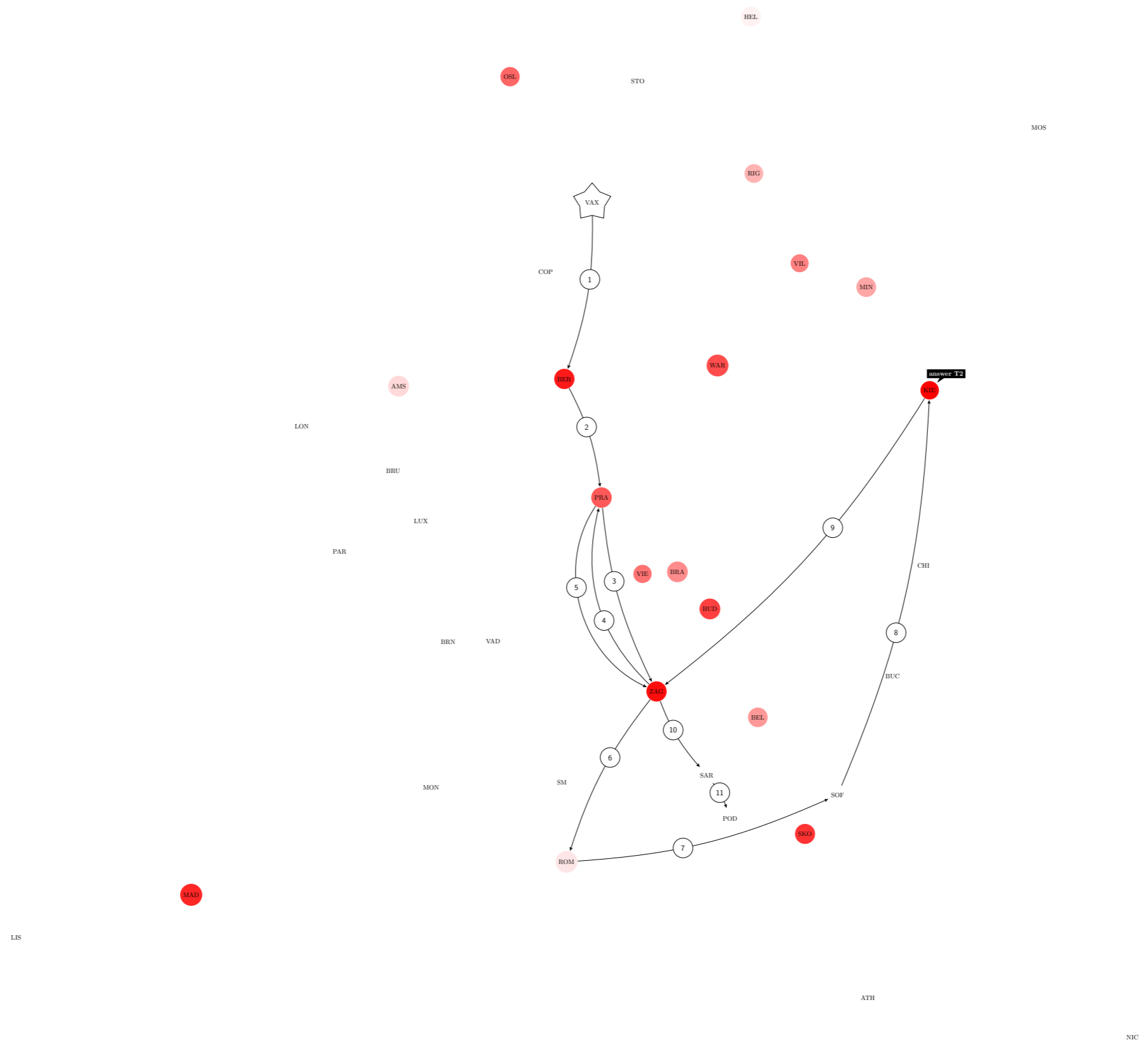


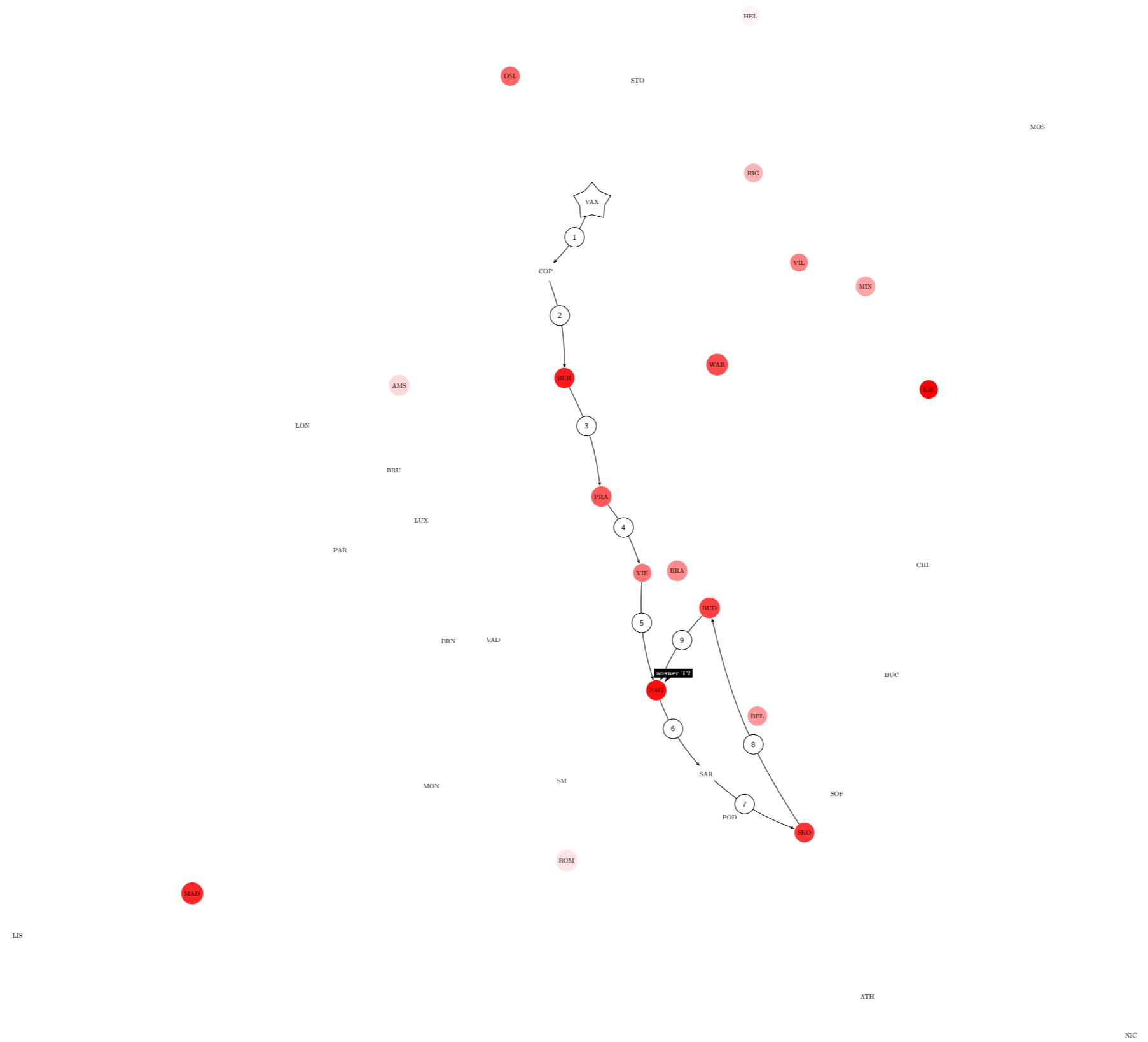
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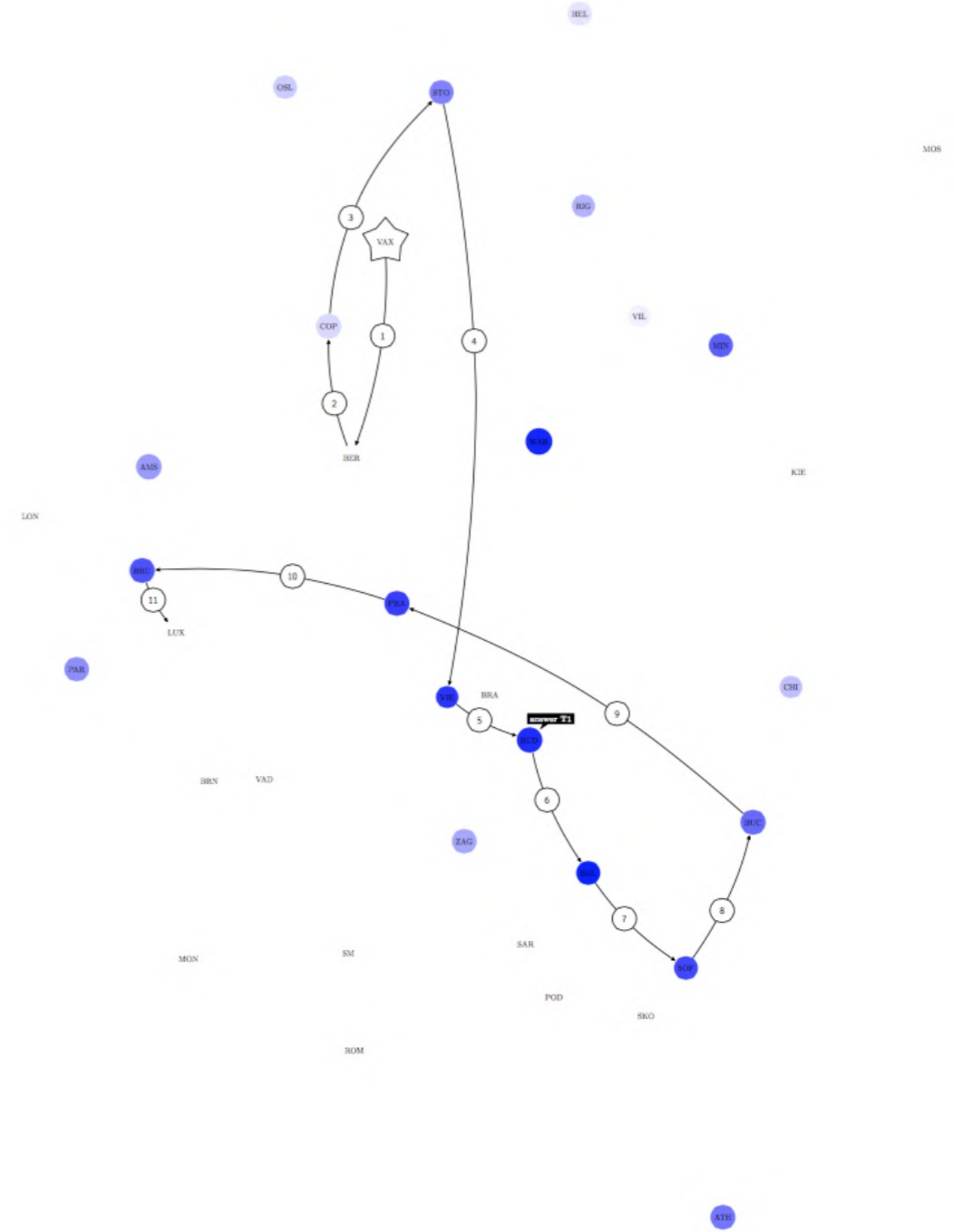
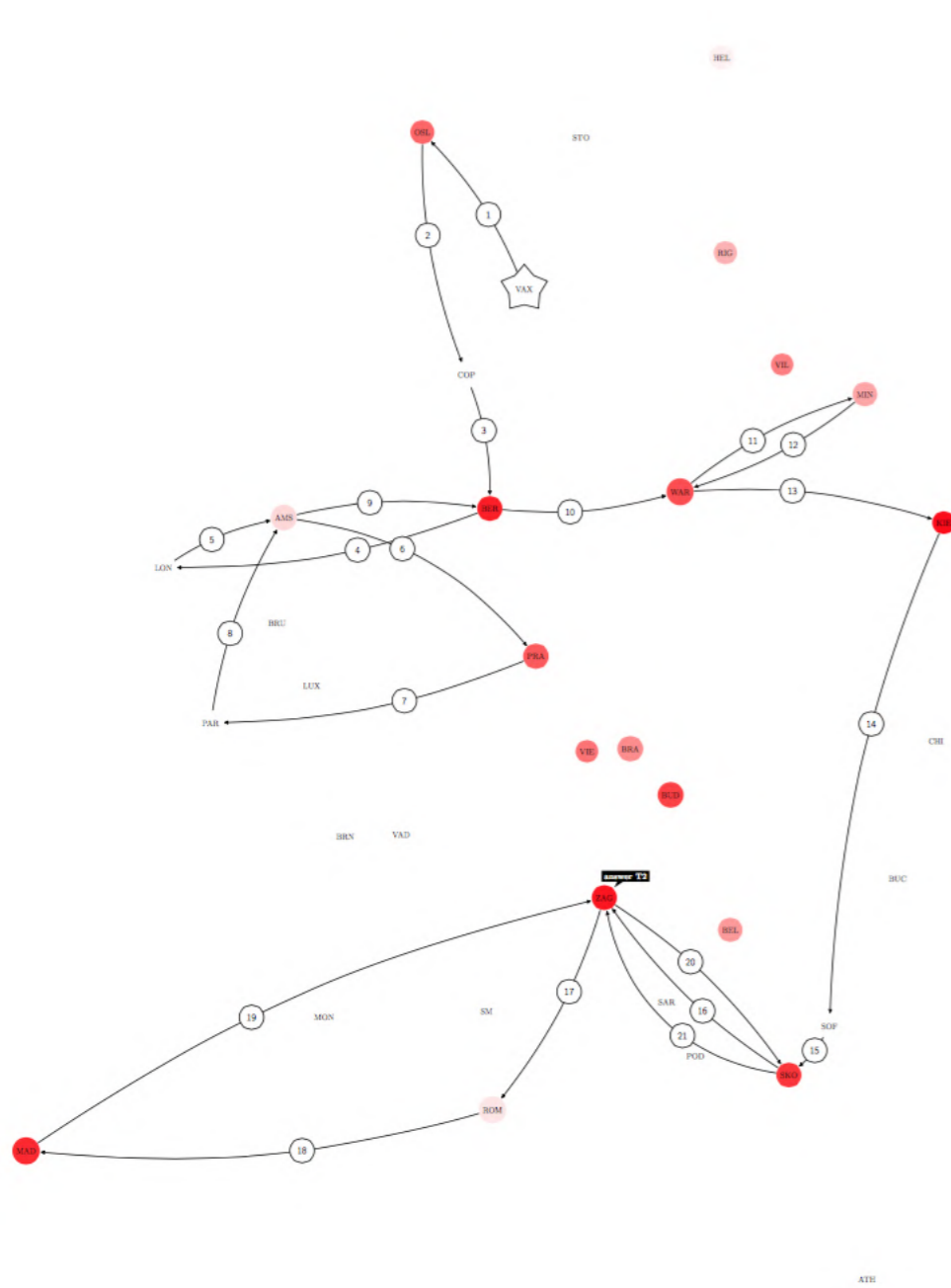
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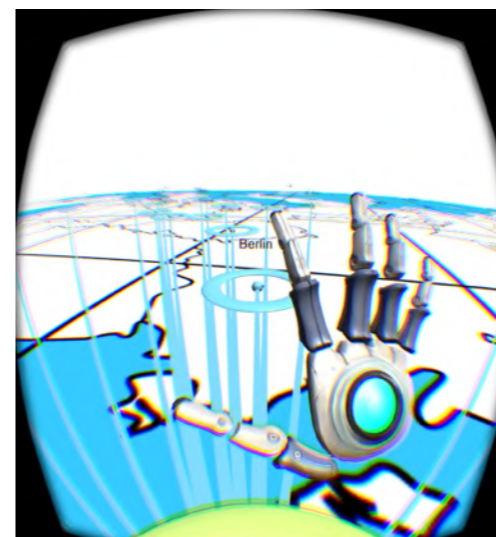
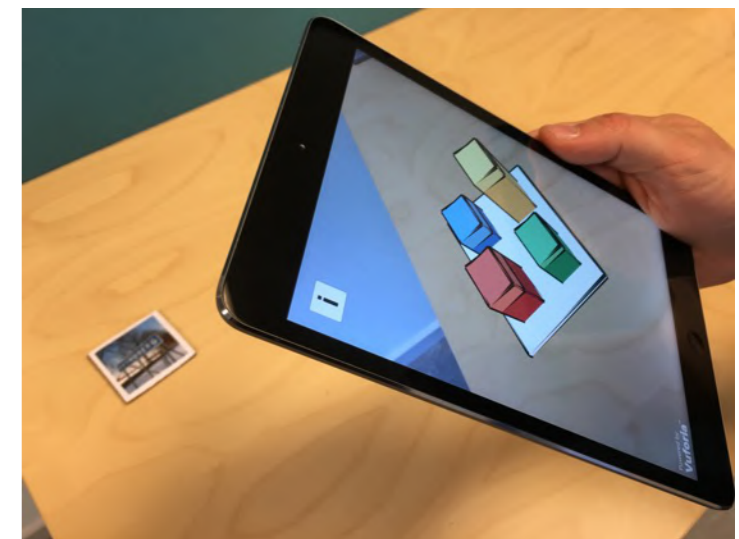
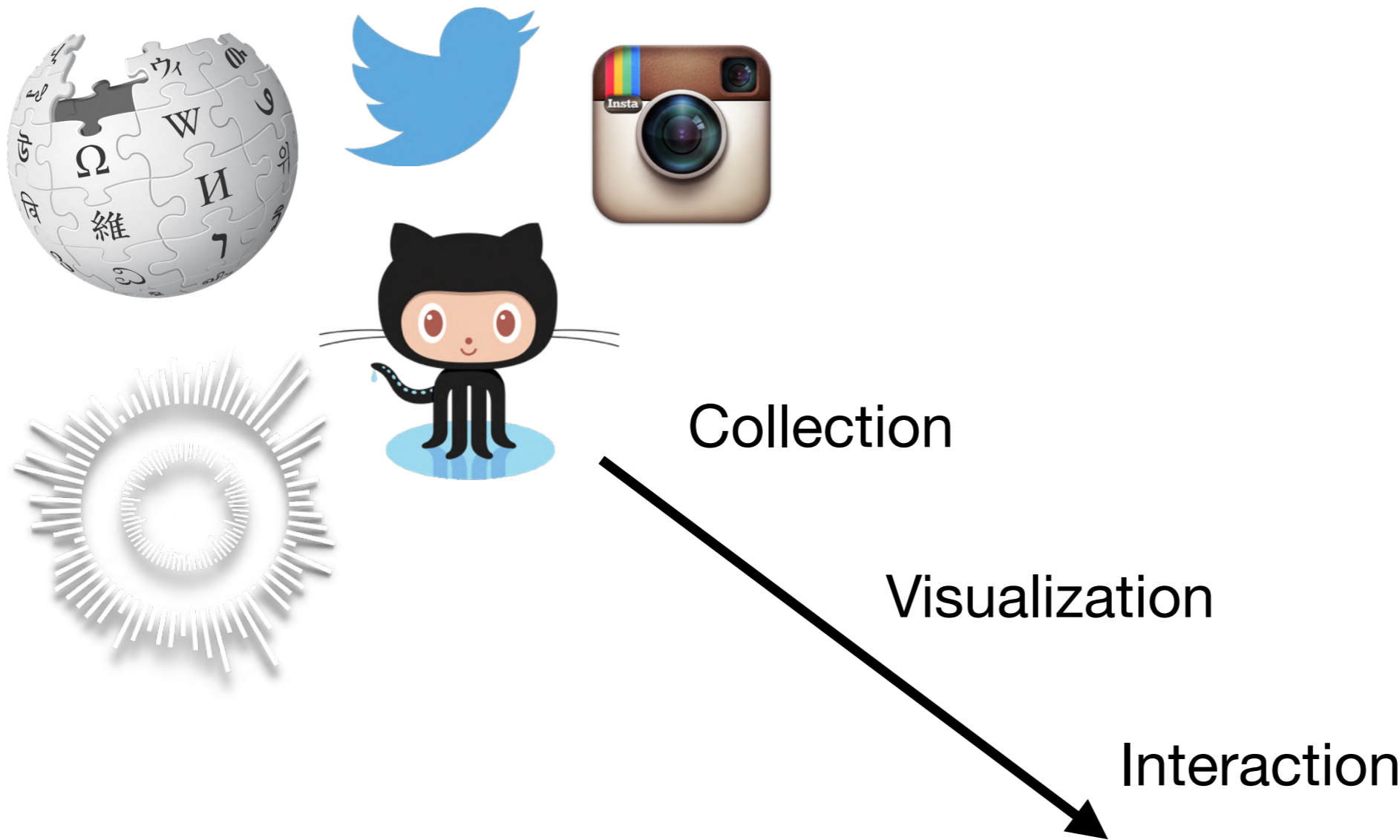


Revisiting

Straight







**Thank you very much for your attention!**

**Questions?**

**Contact**

**Nico Reski**

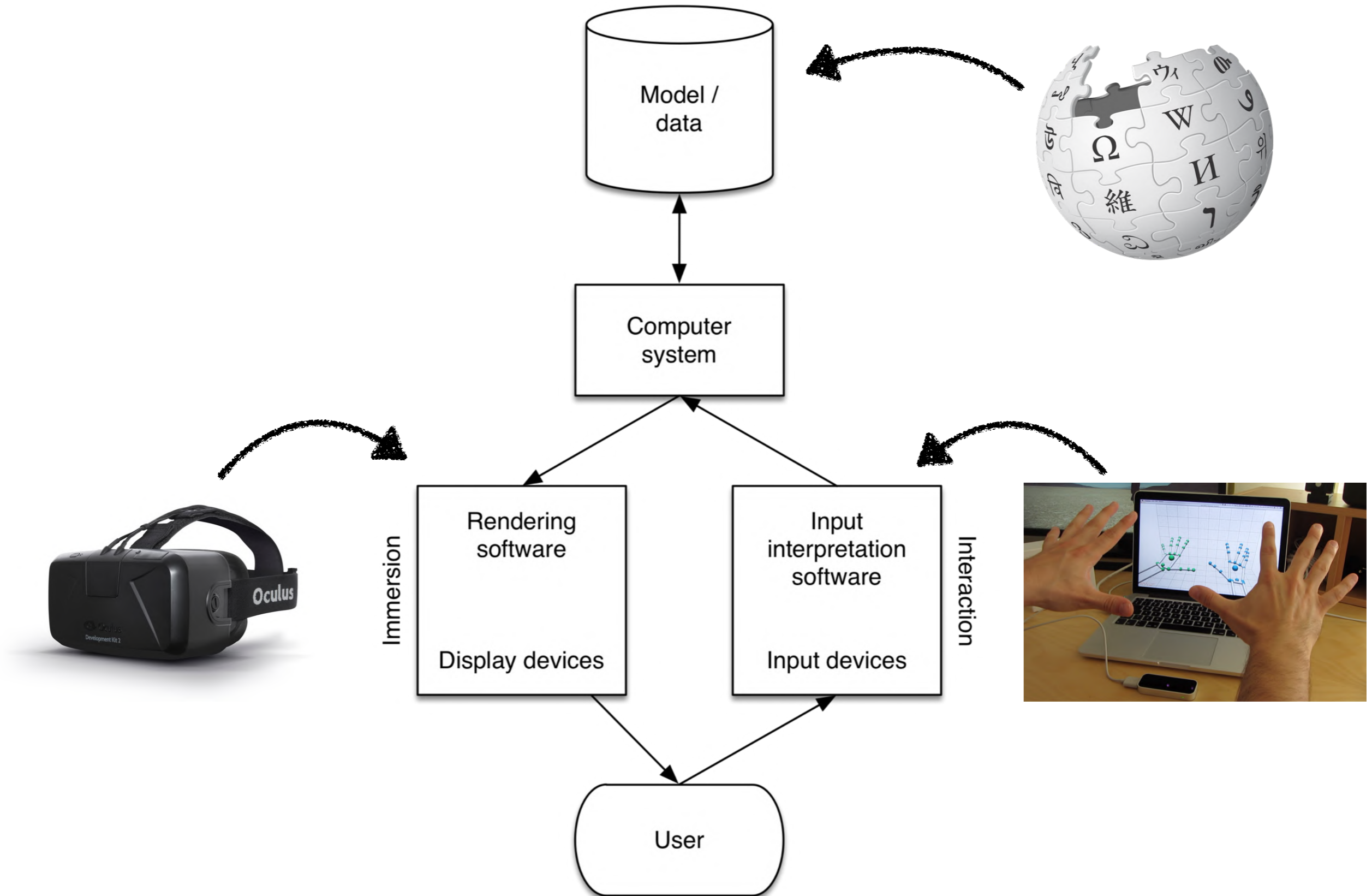
[reski.nicoversity.com](http://reski.nicoversity.com)

[@nicoversity](https://twitter.com/nicoversity)

[nico.reski@lnu.se](mailto:nico.reski@lnu.se)

(PGP Key ID: B061D75B,  
PGP Fingerprint: E826 C9FF 1701 0BAC  
CA98 308C 6772 4499 B061 D75B)





Analysis			Task 1		Task 2	
			AVERAGE	STDEVA	AVERAGE	STDEVA
Average time spent in traveled City (in sec)			32.94	12.94	31.82	10.93
Amount of unique visited cities (max. 45)			11	4	11	4
Amount of visited cities			14	5	13	5
Amount of interactions			42	15	48	19
	Movement/Travels	<b>SUM</b>	15	8	15	8
		Successful	13	5	12	5
		Unsuccessful	2	3	1	2
		Forbidden	1	3	2	2
	Content Exploration	<b>SUM</b>	14	5	13	5
		Trigger	12	4	12	5
		Dismiss	11	4	12	5
		Rotation	2	3	0	1
	Filter Menu	<b>SUM</b>	13	8	20	11
		Trigger	4	2	5	2
		Dismiss	4	2	5	2
		Connection	8	6	13	10
		Area	0	1	8	6
		Population	6	4	1	2
		Reset	2	2	4	3
		Size	1	0	2	1
		Area	0	0	1	1
		Population	1	0	0	0
		Normal	0	0	1	1
Amount of time for completion (in sec)			421.84	160.61	391.74	142.33
in minutes			7.03	2.68	6.53	2.37



## **Experts feedback**

- + scenario works in 3D interactive InfoVis
- + fresh and novel perspective / experience
- concerns of user getting lost in the network

## **Experts suggestions**

- aerial / isometric perspective
- guidance / navigation features
- be more experimental with usage of the 3D space



Inception



**Correct**



**Wrong**



**Forbidden**



**Bottom-up**



**Top-down**



**Right-to-left**



**Left-to-right**