

2021 IEEE International Conference on Information Technologies



South East European University

Faculty Of Contemporary Sciences And Technologies

An approach of utilizing Exponential Rank and In-Inverse Closeness centrality on Recommender Systems

Korab Rrmoku, Besnik Selimi, Lule Ahmedi

Presenting: Korab Rrmoku
kr26918@seeu.edu.mk

Outline

- Introduction & Related work
- SNA centrality measures and concepts
- System overview
- Network overview and recommendation estimation
- Conclusion and future work

Introduction & our approach

- Our approach is to create a recommender system that utilizes social network analysis (SNA) **trustworthiness** metrics in our two-mode network.
- Two phase process:
 - a network with two types of users: ***reviewers*** and ***tourists***,
 - ranking the recommendations using SNA specific measures, such as ***Exponential Ranking Centrality*** and ***In-Inverse Closeness centrality***

SNA Centrality measures concepts

- ***Exponential Ranking***

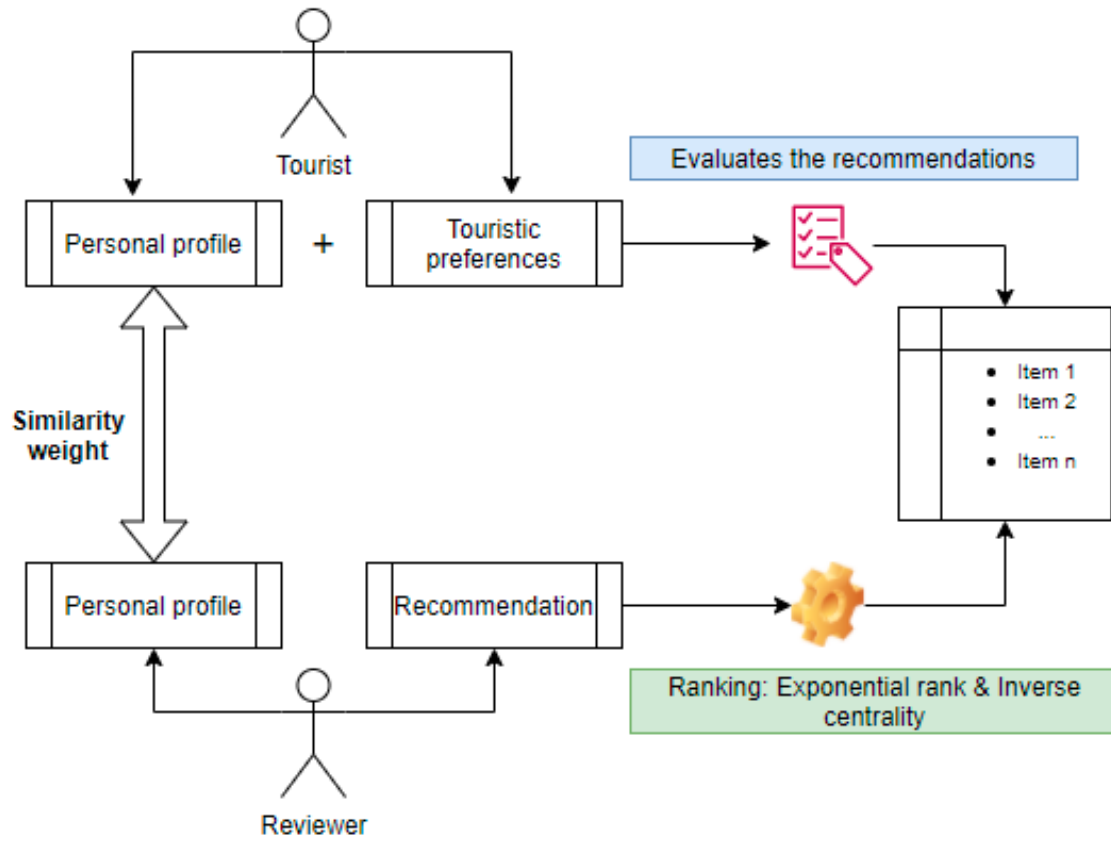
- *defines the centrality of a node as its trustworthiness*
- *takes into consideration all links and their values, even negative values*
- *It utilizes propagation of distrust (if friend X does not trust friend Y, and friend Y does not trust friend Z, then friend X probably will trust friend Z)*

- ***Inverse closeness centrality***

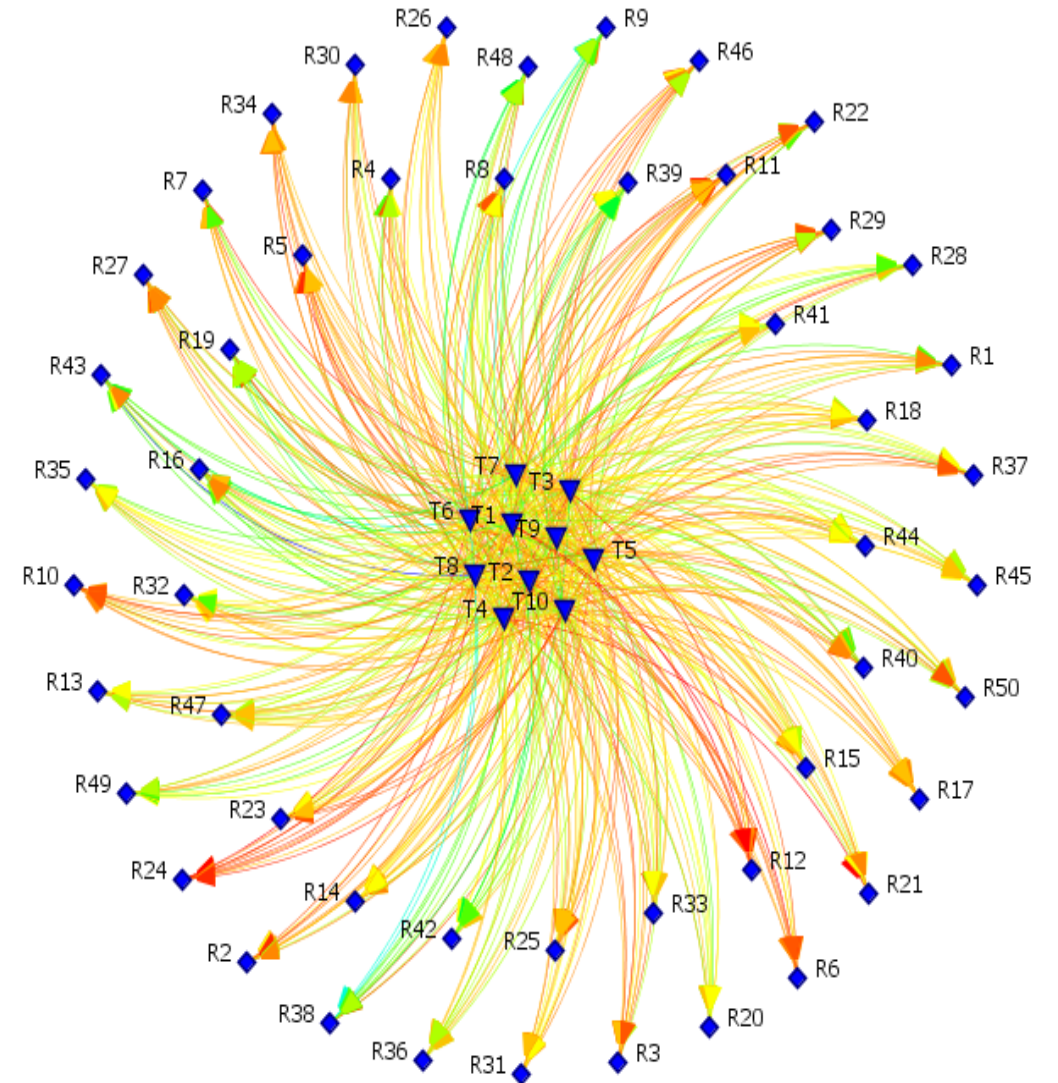
- *signifies the average closeness of a node to the other nodes in a network considering only paths originating out from a node*
- *Mathematically:*

1/(average distance to all other vertices)

System overview

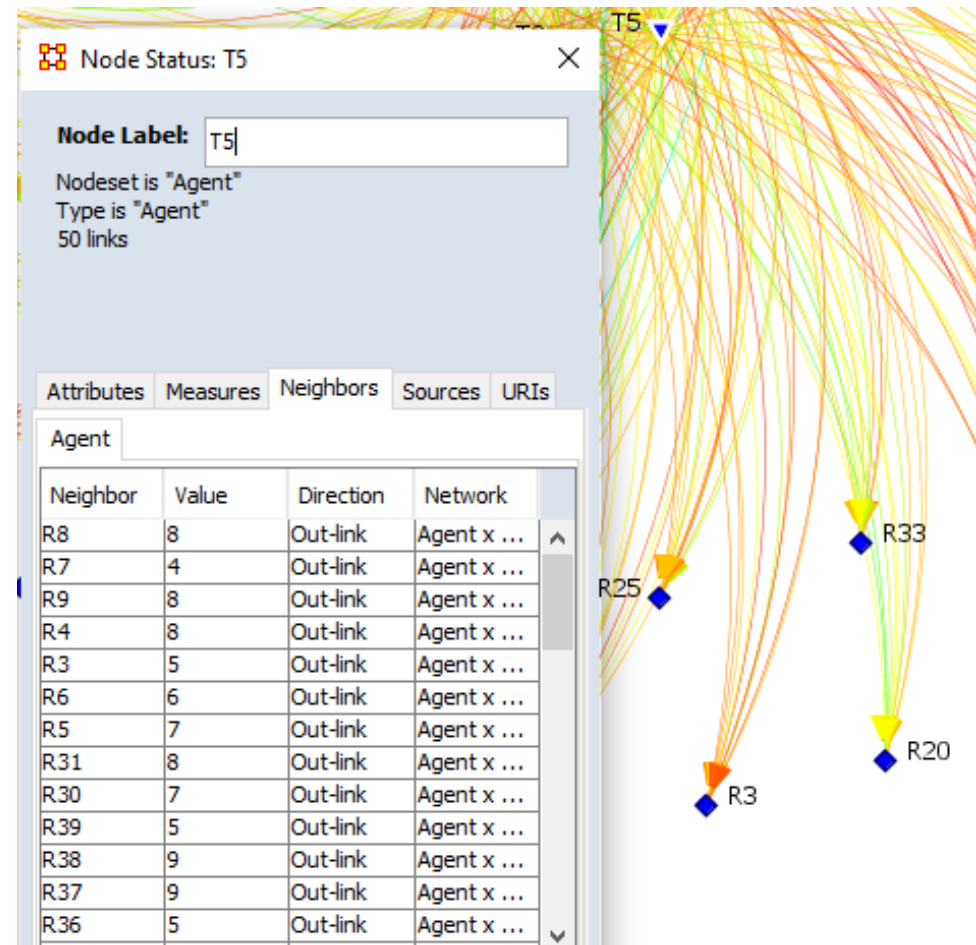


Network overview



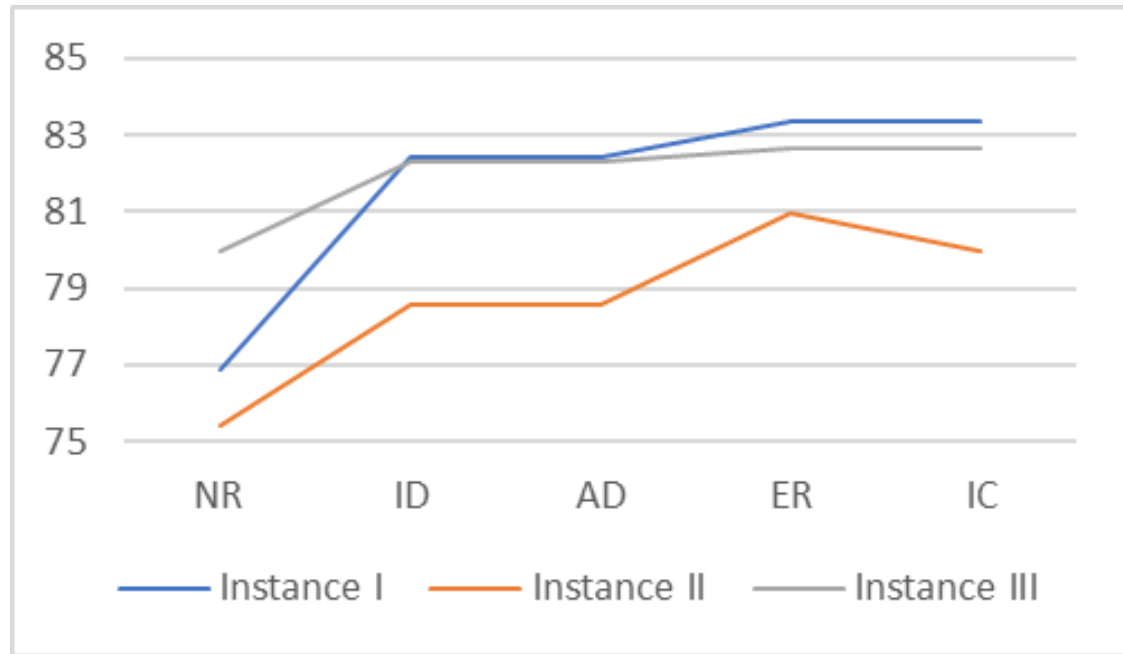
Preliminary results (1/2)

T	POI	Satisfaction	R	Cat.	SubCat.	Rank			Rank		
						ER	Rec.	Calc.	IC	Rec.	Calc.
T1	Burimi I Drinit te Bardhe	3-Më pelqen shumë	R6	Natyre	Park	1	R6	100	6	R6	100
T2	Kalaja e Vushtrise	2-Më pelqen	R45	Arkitekture	Monumen	23			21		
	Municipium Ulpiana	3-Më pelqen shumë	R4	Arkeologji	Monumen	16	R4	100	17	R4	100
	Ura e Terezive - Gjakove	2-Më pelqen	R47	Arkitekture	Monumen	26			28		
T3	Liqeni I batllaves	2-Më pelqen	R3	Natyre	Park	3			9		
	Burimi I Drinit te Bardhe	3-Më pelqen shumë	R6	Natyre	Park	1	R6	100	6	R46	100
T4	Rugova	3-Më pelqen shumë	R46	Natyre	Park	2			1		
	Brezovica	2-Më pelqen	R11	Natyre	Park	19			14		
	Brezovica	2-Më pelqen	R24	Natyre	Park	18			18		
	Ura e vjeter e gurit - Priz	3-Më pelqen shumë	R23	Arkitekture	Monumen	13	R34	100	3	R23	100
	Municipium Ulpiana	3-Më pelqen shumë	R21	Arkeologji	Monumen	9			26		
	Ujevara e Mirushes	3-Më pelqen shumë	R34	Natyre	Zbavitje	7			4		
T5	Ndertesat e Lidhjes se Pr	2-Më pelqen	R25	Arkitekture	Muze	14			20		
	Xhamia e çarshisë - Xha	2-Më pelqen	R19	Art Religjio	Xhami	12			35		
	Municipium Ulpiana	3-Më pelqen shumë	R21	Arkeologji	Monumen	9	R21	100	26	R21	100
	Xhamia e vjetër (shek. X	2-Më pelqen	R38	Art Religjio	Xhami	15			38		
T6	Xhamia e Sulltan Fatih M	2-Më pelqen	R48	Art Religjio	Xhami	17			39		
	Ujvara e Mirushes	2-Më pelqen	R34	Natyre	Zbavitje	7	R34	67	4	R34	67
T7	Municipium Ulpiana	2-Më pelqen	R21	Arkeologji	Monumen	9	R21	67	26	R21	67
T8	Grand Store	3-Më pelqen shumë	R50	Tregje Lok.	Zbavitje	10	R50	100	13	R50	100
	Xhamia e çarshisë - Xha	2-Më pelqen	R19	Art Religjio	Xhami	12			35		
	Xhamia e vjetër (shek. X	3-Më pelqen shumë	R38	Art Religjio	Xhami	15	R19	67	38	R19	67
T9	Xhamia e Sulltan Fatih M	2-Më pelqen	R48	Art Religjio	Xhami	17			39		
	Grand Store	1-Më pelqen paksa	R31	Tregje Lok.	Zbavitje	5	R31	33	2	R31	33
						Avg.		83.3		83.3	



Instance I – 10 tourists, 50 reviewers,
 Instance II – 7 tourists, 50 reviewers,
 Instance III – 5 tourists, 50 reviewers.

Preliminary results (2/2)



Instance	Baseline 1	Baseline 2		Our approach	
	NR	ID	AD	ER	IC
I	76.85	82.43	82.43	83.33	83.33
II	75.39	78.56	78.56	80.95	79.99
III	79.96	82.33	82.33	82.66	82.66

Thank You !

