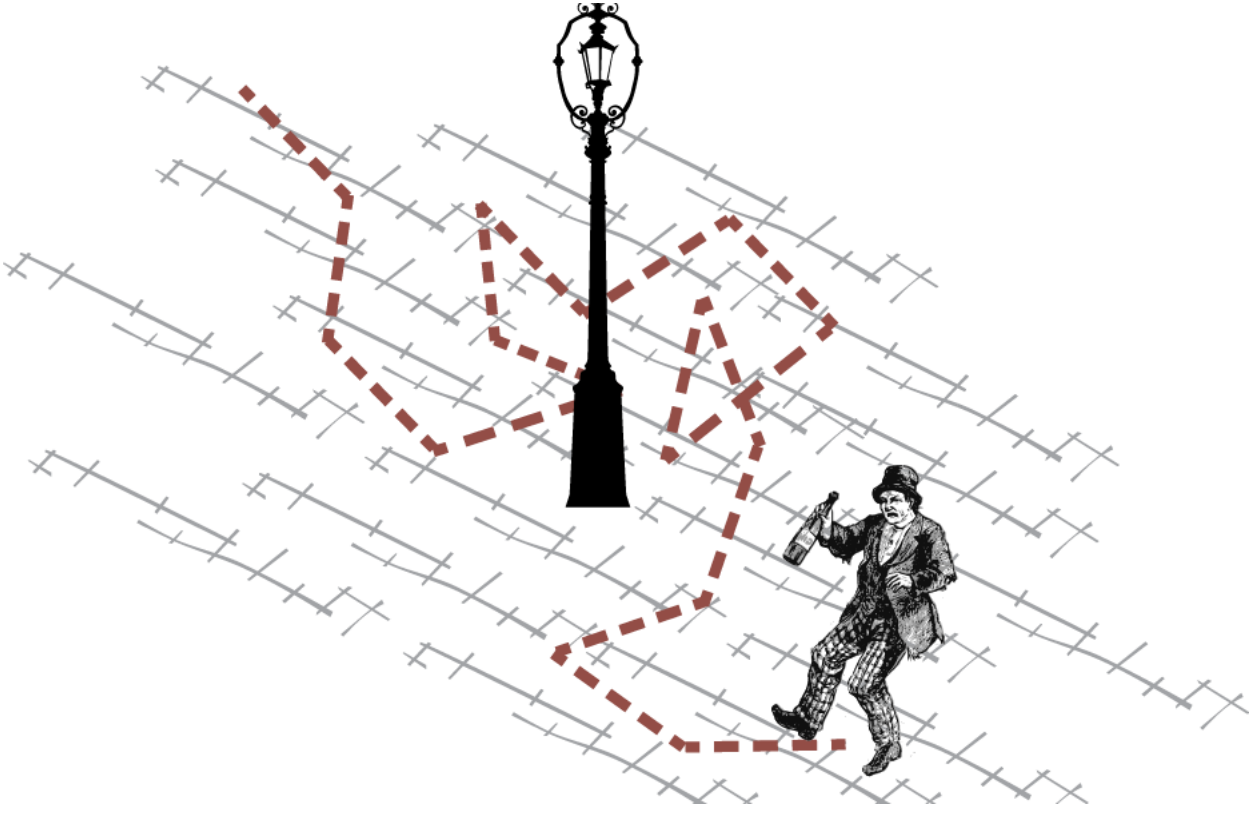
DS8104: Network Science

Class 9: Random Walk and Assortativity



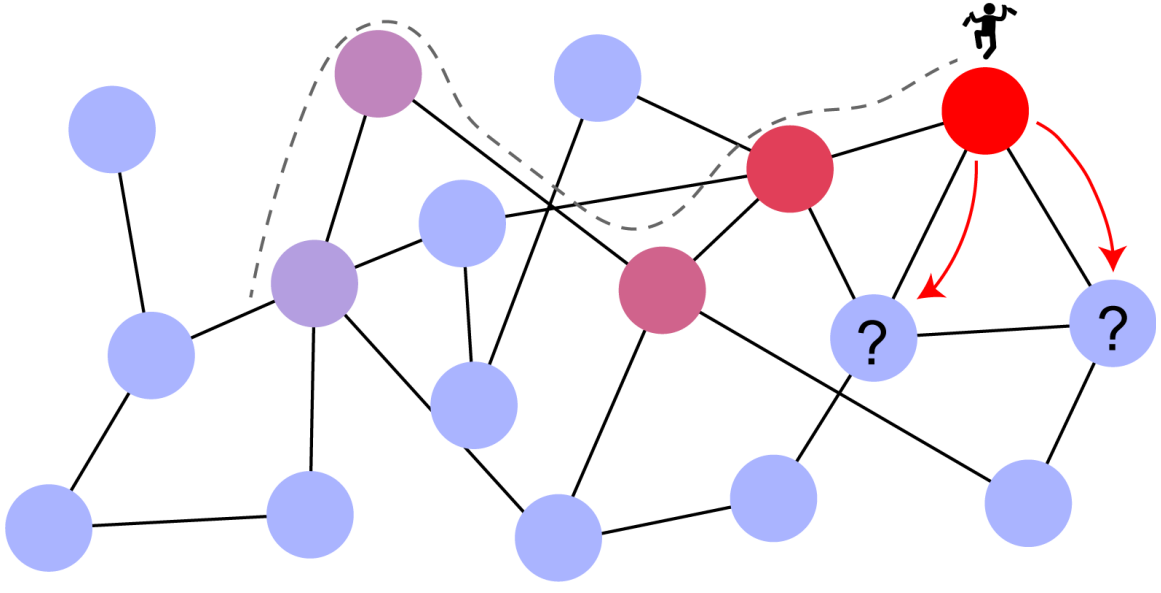
https://alexandergates.net

https://uvads8104.github.io/

Class Project Timeline

Choose paper & approval	2/21	(next tuesday)
Presentation – Intro Paper	3/2	
Writeup – Reproduction Paper	4/4	
Presentation – Reproduction Paper	4/6	
Presentation – Final Project	4/27	
Writeup – Final Paper	5/5	

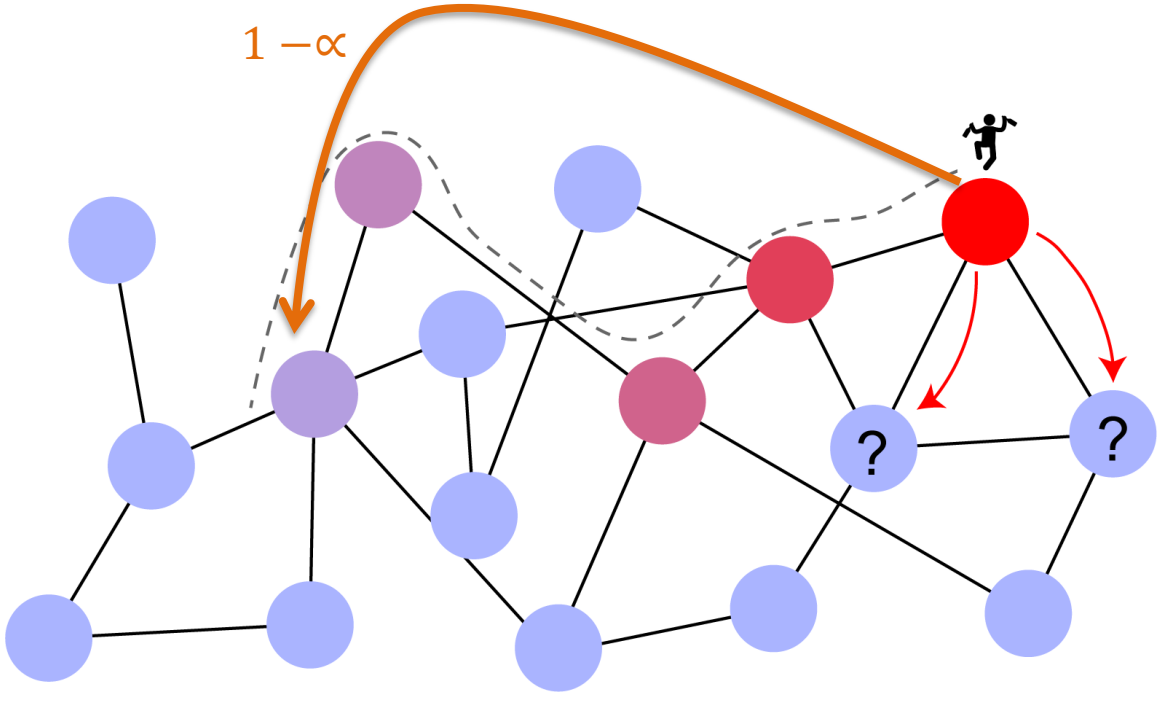
Random Walk



$$T_{ij} = \frac{A_{ij}}{s_i^{\text{out}}} ,$$

$$p_j(n+1) = \sum_{i=1}^{N} p_i(n) T_{ij}$$

Personalized Random Walk



$$p_i(t+1) = \alpha \sum_{j=1}^{N} p_j(t) T_{ji} + (1-\alpha) u_i$$

Importance of RW

Model of diffusion (information, policy, technology, etc.)

Intimately related to the concept of “central nodes”

also related to flow, and the idea of being “trapped”

Used a lot for search / recovery

Time provides a parameter that defines a way to “integrate” over a local neighborhood