

Evolving Interest for Information Diffusion Prediction on Social Network

Yuyang Liu**, Junruo Gao**, Zefang Zhao**, Haibo Wu*, Zhaojuan Yue*, Jun Li*

* *Computer Network Information Center, Chinese Academy of Sciences, Beijing, China*

***University of Chinese Academy of Sciences, Beijing, China*

{liyuyang, gaojunruo, zhaozefang, wuhaibo, yuezhaojuan, lijun}@cnic.cn

Abstract—Even though conventional methods have contributed a lot to predicting information diffusion utilizing an end-to-end framework, they omit to consider the reason why each participant is involved in the cascade. Inspired by the ubiquitous pattern that users are inclined to take part in the discussion with attractive content and like-mind participants, we propose a temporal evolving interest-driven cascade prediction framework, named TEIC. The proposed TEIC is capable of automatically capturing the interest-driven forwarding behavior of individuals from the micro perspective and assembling them for macro-level cascade size prediction. Taking historical social actions as the input, the temporal evolving interest encoder is designed to characterize individual social preferences that change dynamically over time. Furthermore, we adopt a cascade aggregator to integrate microscopic interest-driven social actions into macroscopic cascade representations for predicting the incremental diffusion scale. We compare the TEIC with the multiple baselines, including hand-crafting feature regression, generative methods and deep learning-based models. Extensive experiments on two real-world datasets demonstrate that the proposed model significantly outperforms state-of-the-art approaches.

Keyword—social network, information diffusion, cascade prediction, neural network, evolving interest



Yuyang Liu received his Bachelor's degree from Northwestern Polytechnical University. Now he is a Ph.D. student in the University of Chinese Academy of Sciences. His research focuses on social network analysis and data mining.



Junruo Gao received her Bachelor's degree from Sichuan University. Now she is a Ph.D. student in University of Chinese Academy of Sciences. Her current research interests include artificial intelligence and recommendation system.



Zefang Zhao received his Bachelor's degree from Taiyuan University of Technology. Now he is a Ph.D. student in the University of Chinese Academy of Sciences. His research focuses on deep learning, natural language process and sentiment analysis.



Haibo Wu is an associate professor at the Computer Network Information Center of Chinese Academy of Sciences. Her research interests include network management and information diffusion modeling.



Zhaojuan Yue is a senior engineer at the Computer Network Information Center of Chinese Academy of Sciences. Her research interests include network management and information diffusion modeling.



Jun Li is a research fellow and doctoral supervisor at the Computer Network Information Center of Chinese Academy of Sciences, specially appointed researcher of Chinese Academy of Sciences. His main research interests are artificial intelligence and big data technical applications and future Internet architecture.