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Title: A Coupled Friedkin-Johnsen Model of Popularity Dynamics in Social Media

Abstract: Popularity dynamics in social media depend on a complex interplay of social influence between users and popularity-based recommendations that are provided by the platforms. In this work, we introduce a discrete-time dynamical system to model the evolution of popularity on social media. Our model generalizes the well-known Friedkin-Johnsen model to a set of influencers vying for popularity. We study the asymptotic behavior of this model and illustrate it with numerical examples. Our results highlight the interplay of social influence, past popularity, and content quality in determining the popularity of influencers.

Bio: Paolo Frasca received the Ph.D. degree from the Politecnico di Torino, Turin, Italy, in 2009. He was an Assistant Professor at the University of Twente, Enschede, Netherlands, from 2013 to 2016. Since October 2016, he has been a CNRS Researcher at GIPSA-Lab, Grenoble, France, where since 2021 he has led the DANCE research team devoted to the Dynamics and Control of Networks. His research interests include the theory of networks and control systems, with applications in transportation and social networks. He has (co)authored over 50 journal publications on these topics. He has received several awards and recognitions, including the 2013 Best Paper Prize of the SIAM Journal on Control and Optimization and the 2022 IEEE CSS TC Outstanding Student Paper award (as advisor). Dr. Frasca has served as an Associate Editor for several conferences and journals, including the IEEE Control Systems Letters and Automatica.