

A Comparative Evaluation of the SIR and SEIZ Epidemiological Models to Describe the Diffusion Characteristics of COVID-19 Polarizing Viewpoints on Online

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Abstract : This study is conducted to examine how opposing viewpoints related to COVID-19 were diffused on Twitter. To accomplish this, six datasets using two epidemiological models, SIR (Susceptible, Infected, Recovered) and SEIZ (Susceptible, Exposed, Infected, Skeptics), were analyzed. The six datasets were chosen because they represent opposing viewpoints on the COVID-19 pandemic. Three of the datasets contain anti-subject hashtags, while the other three contain pro-subject hashtags. The time frame for all datasets is three years, starting from January 2020 to December 2022. The findings revealed that while both models were effective in evaluating the propagation trends of these polarizing viewpoints, the SEIZ model was more accurate with a relatively lower error rate (6.7%) compared to the SIR model (17.3%). Additionally, the relative error for both models was lower for anti-subject hashtags compared to pro-subject hashtags. By leveraging epidemiological models, insights into the propagation trends of polarizing viewpoints on Twitter were gained. This study paves the way for the development of methods to prevent the spread of ideas that lack scientific evidence while promoting the dissemination of scientifically backed ideas.

Keywords : mathematical modeling, epidemiological model, seiz model, sir model, covid-19, twitter, social network analysis, social contagion

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