Community Detection Problem Based on Polarization Measures. An application to Twitter: the COVID-19 case in Spain

Here we attach the obtained results when applying the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$ for several values of the balancing factor γ, considering the scenarios in which $\varphi =$ max and $\phi =$ min as well as $\varphi =$ max and $\phi =$ min. For both cases, the negation operator considered is $N(x) = 1 - x$. We also include the performance of the Louvain algorithm considering the graph $G = (V, E)$.

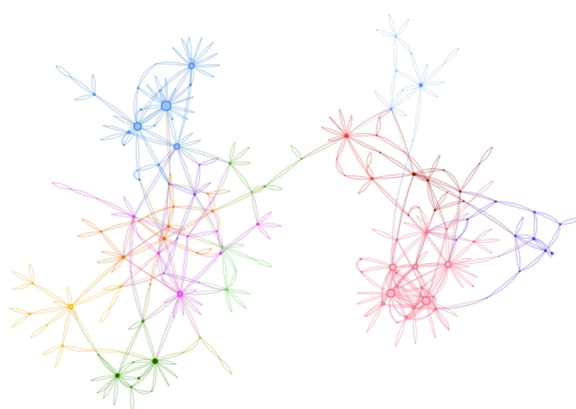

Figure 1: Partitions obtained with the Louvain algorithm in the graph $G = (V, E)$.

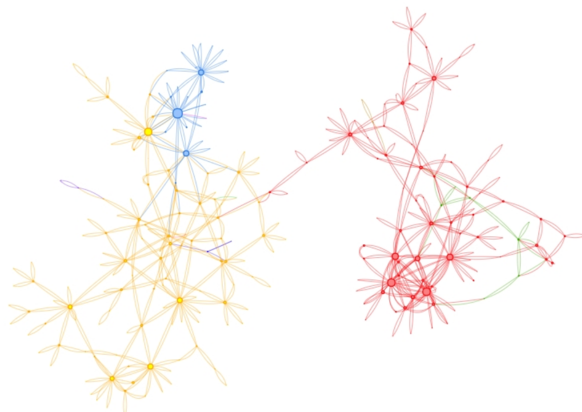

Figure 2: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.1$; $\varphi = \max$; $\phi = \min$; $N(x) = 1 - x$.

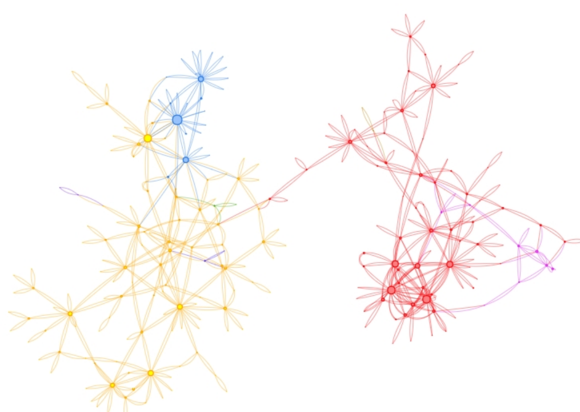

Figure 3: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.2$; $\varphi = \max$; $\phi = \min$; $N(x) = 1 - x$.

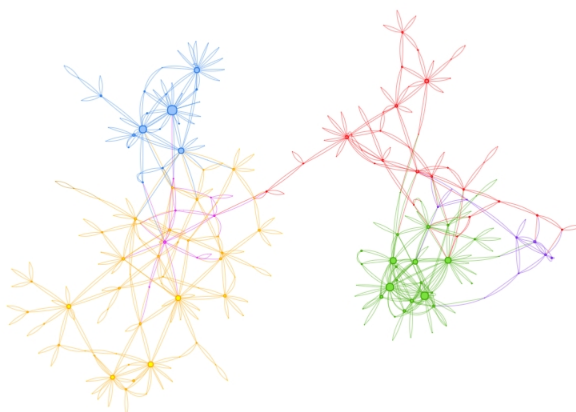

Figure 4: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.3$; $\varphi = \max$; $\phi = \min$; $N(x) = 1 - x$.

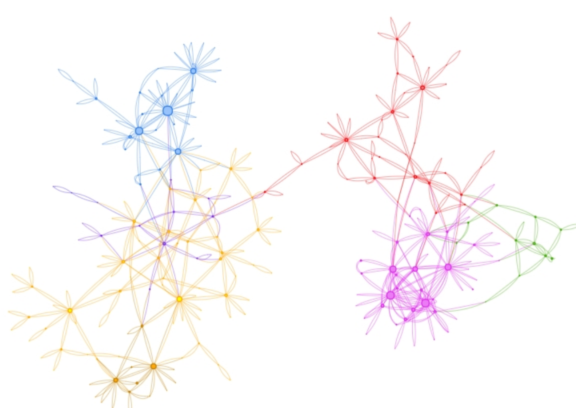

Figure 5: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.4$; $\varphi = \max$; $\phi = \min$; $N(x) = 1 - x$.

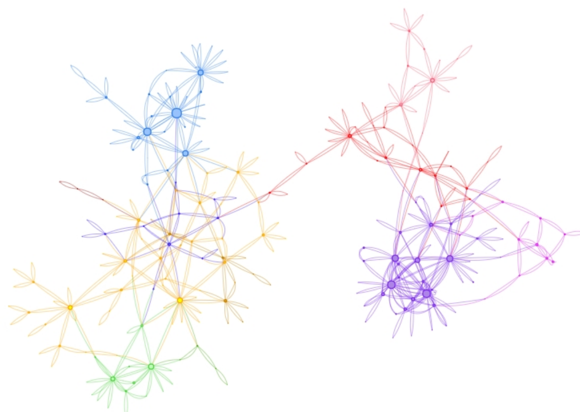

Figure 6: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.5$; $\varphi = \max$; $\phi = \min$; $N(x) = 1 - x$.

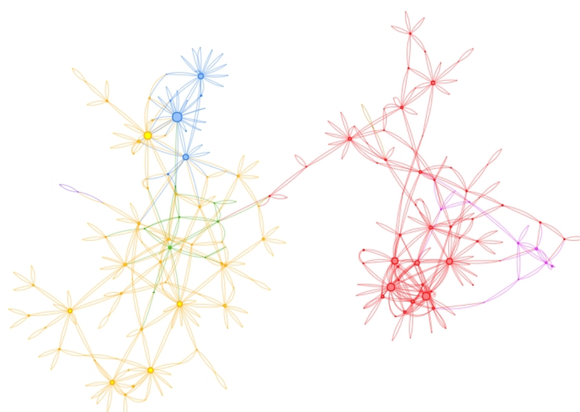

Figure 7: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.1$; $\varphi = \max$; $\phi = prod$; $N(x) = 1 - x$.

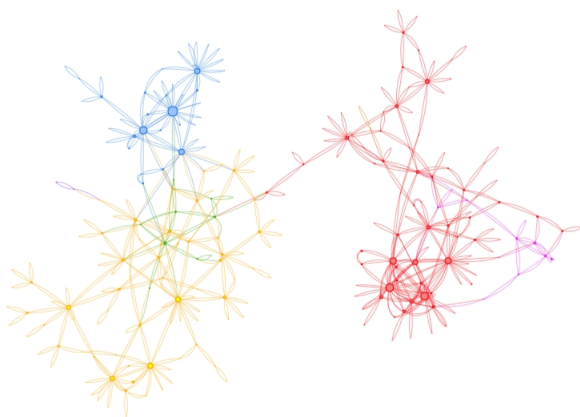

Figure 8: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.2$; $\varphi = \max$; $\phi = prod$; $N(x) = 1 - x$.

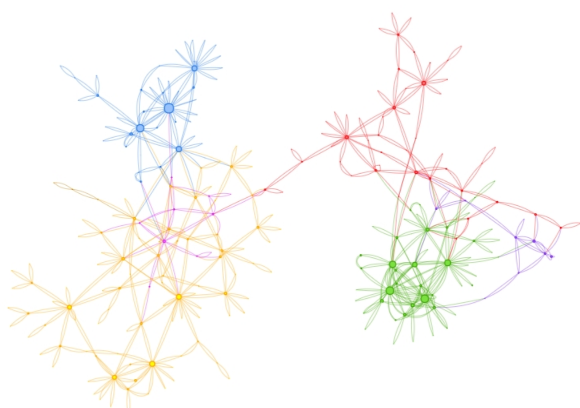

Figure 9: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.3$; $\varphi = \max$; $\phi = prod$; $N(x) = 1 - x$.

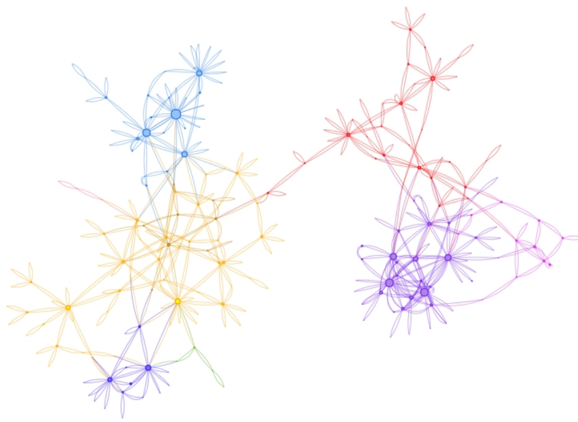

Figure 10: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.4$; $\varphi = \max$; $\phi = prod$; $N(x) = 1 - x$.

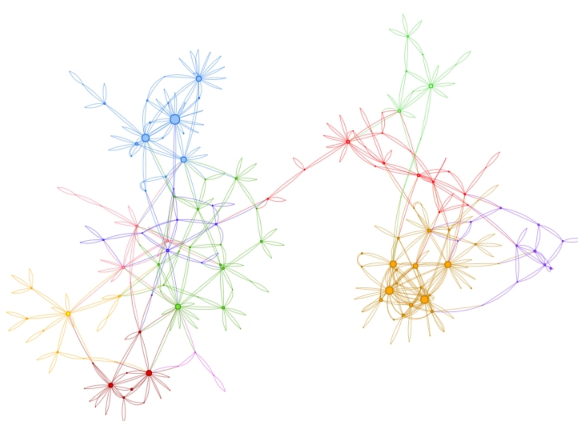

Figure 11: Partitions obtained with the Polarization Louvain algorithm in the non-polarization extended fuzzy graph $\widetilde{G} = (V, E, \mu_P)$. $\gamma = 0.5$; $\varphi = \max$; $\phi = prod$; $N(x) = 1 - x$.