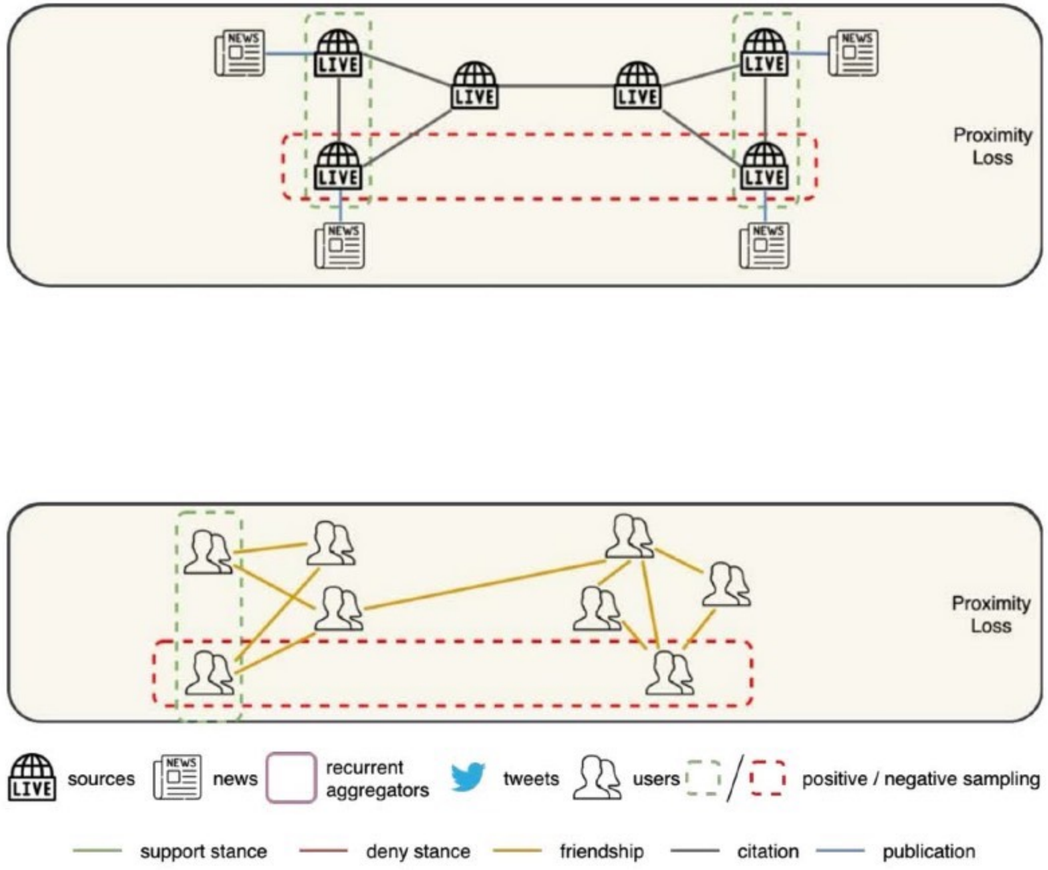
Methodology

FANG - Unsupervised Proximity Loss

- Derive the Proximity Loss from the hypothesis that closely connected social entities often behave similarly.
  - motivated by the echo chamber phenomenon
- Within each sub-graph G' (news source & users), loss function:
- $$\mathscr{L}_{\text{prox}} = -\sum_{u \in G'} \left[\sum_{r_p \in P_r} \log\left(\sigma\left(z_r^\top z_{r_p}\right)\right) + Q \cdot \sum_{r_n \in N_r} \log\left(\sigma\left(-z_r^\top z_{r_n}\right)\right) \right]$$
  - Minimizing the distances between neighboring (positive) nodes
  - Maximizing the distances between remote (negative) nodes



Methodology

FANG - Self-supervised Stance Loss

- Common stance → close representation
- Projection function from representation space to stance space c
  - User projection function: $\alpha_c(u) = \mathrm{A}_c z_u$
  - News article projection function: $\beta_c(a) = \mathrm{B}_c z_a$
- Stance loss function:
- $$\mathscr{L}_{\text{stance}} = -\sum_{u,a,c} y_{u,a,c} \log(f(u,a,c))$$
- Stance detector: $f(u,a,c) = softmax(\alpha_c(u)^\top \beta_c(a))$