

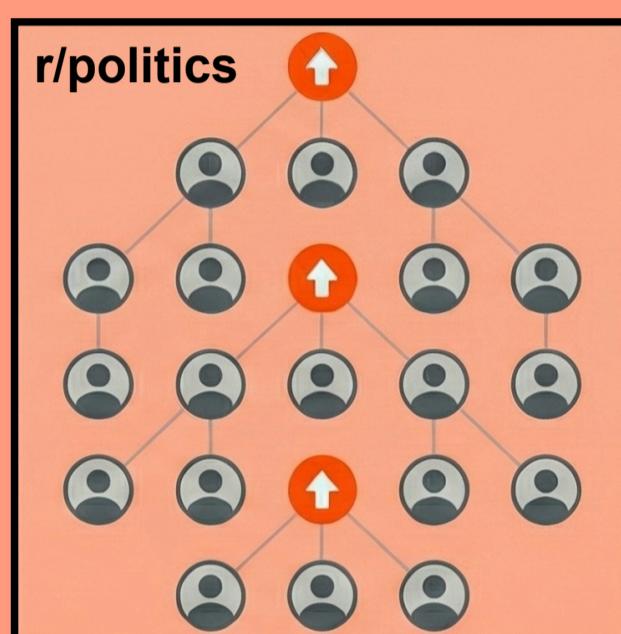
# Communities Know First: Early-Adopter Structure Predicts Reddit Virality

Saiankit Shankar, Nitin Rayala, Poojan Patel, Nishal Karamshetty, Suhas Vadlapatla

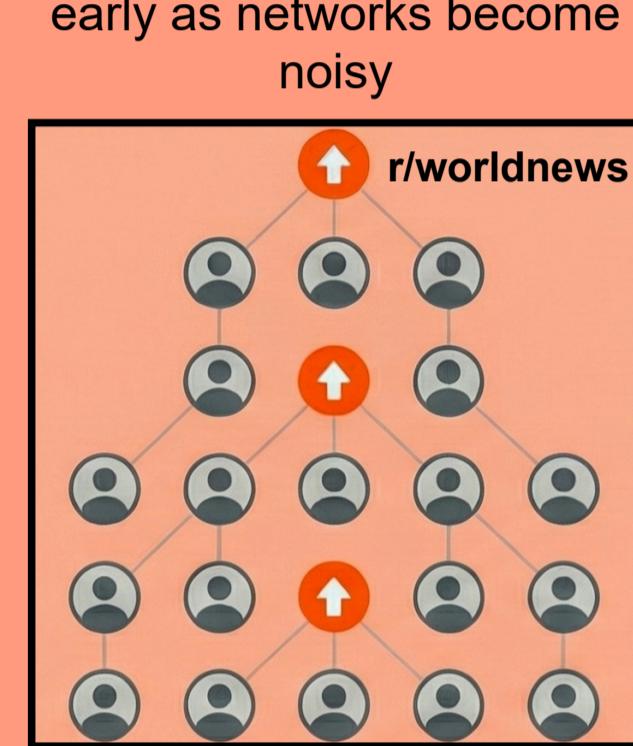


**In a Rush? Read here!**

## Why Communities?

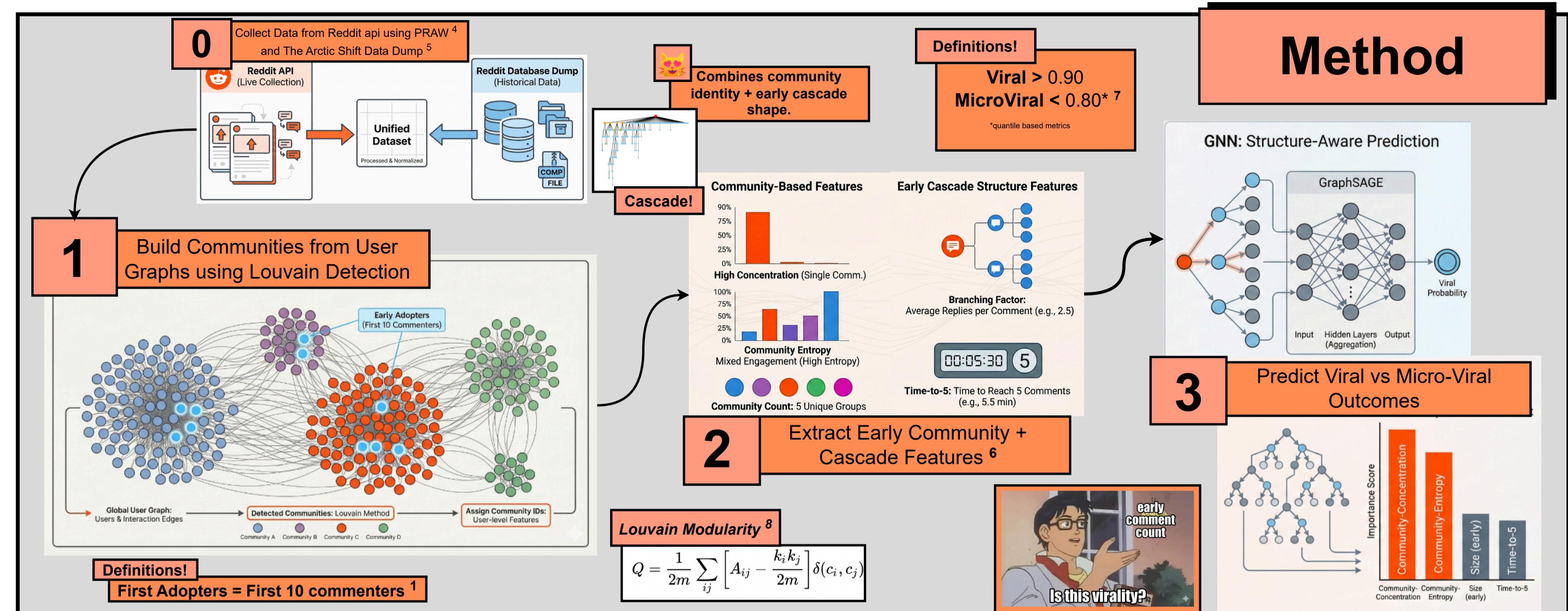


For early virality predictions cascades look similar<sup>1</sup> across topics



Though they look similar the **subreddits** behave very differently<sup>2</sup>

Reddit Post    Early Commenter    Comment Replies

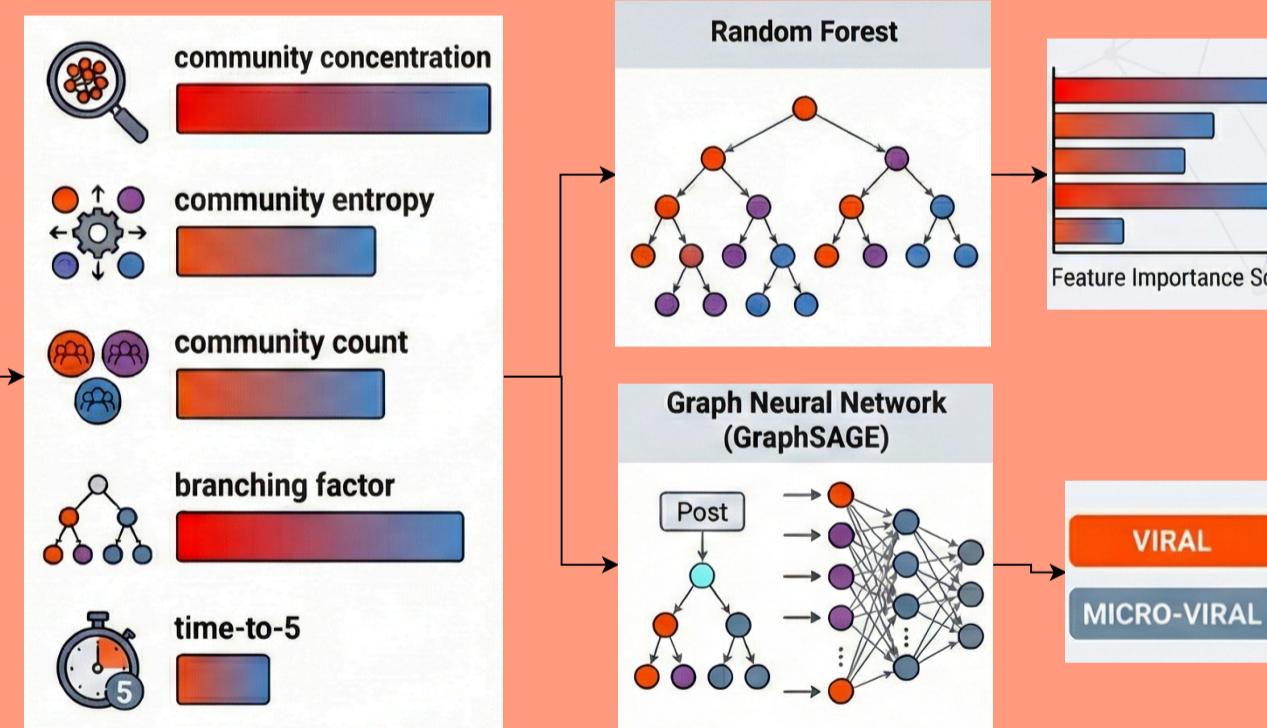


## Method

## What are we doing?



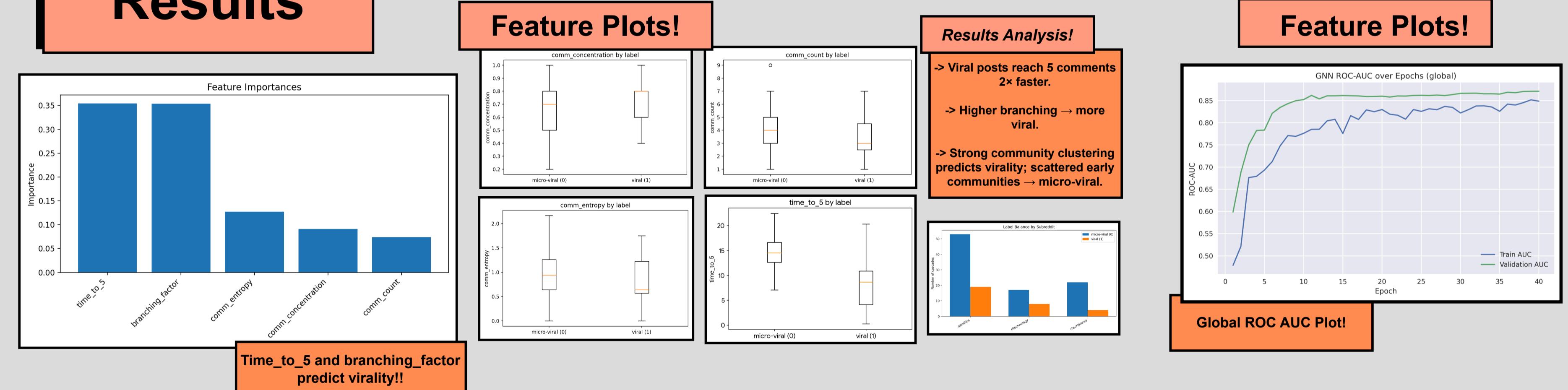
**Detect Communities:**  
Identify user clusters from interaction graphs.  
3



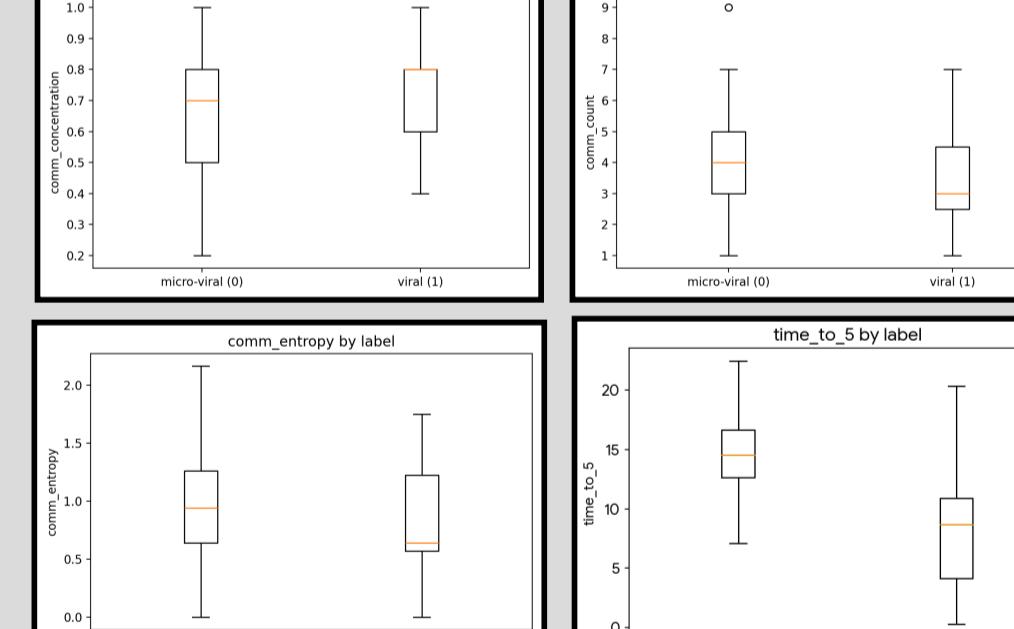
**Extract Early Signals:**  
Compute features capturing community structure and early dynamics.

**Predict Virality and Feature Importance:**  
Compute features capturing community structure predict virality using GNNs

## Results

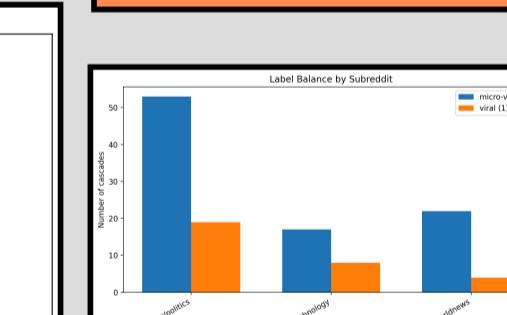


### Feature Plots!

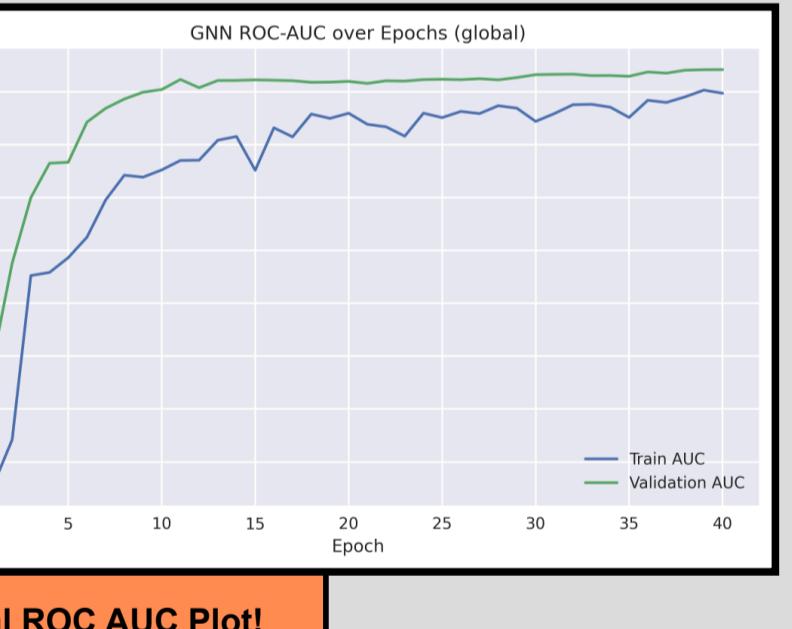


**Results Analysis!**

- > Viral posts reach 5 comments 2x faster.
- > Higher branching → more viral.
- > Strong community clustering predicts virality; scattered early communities → micro-viral.

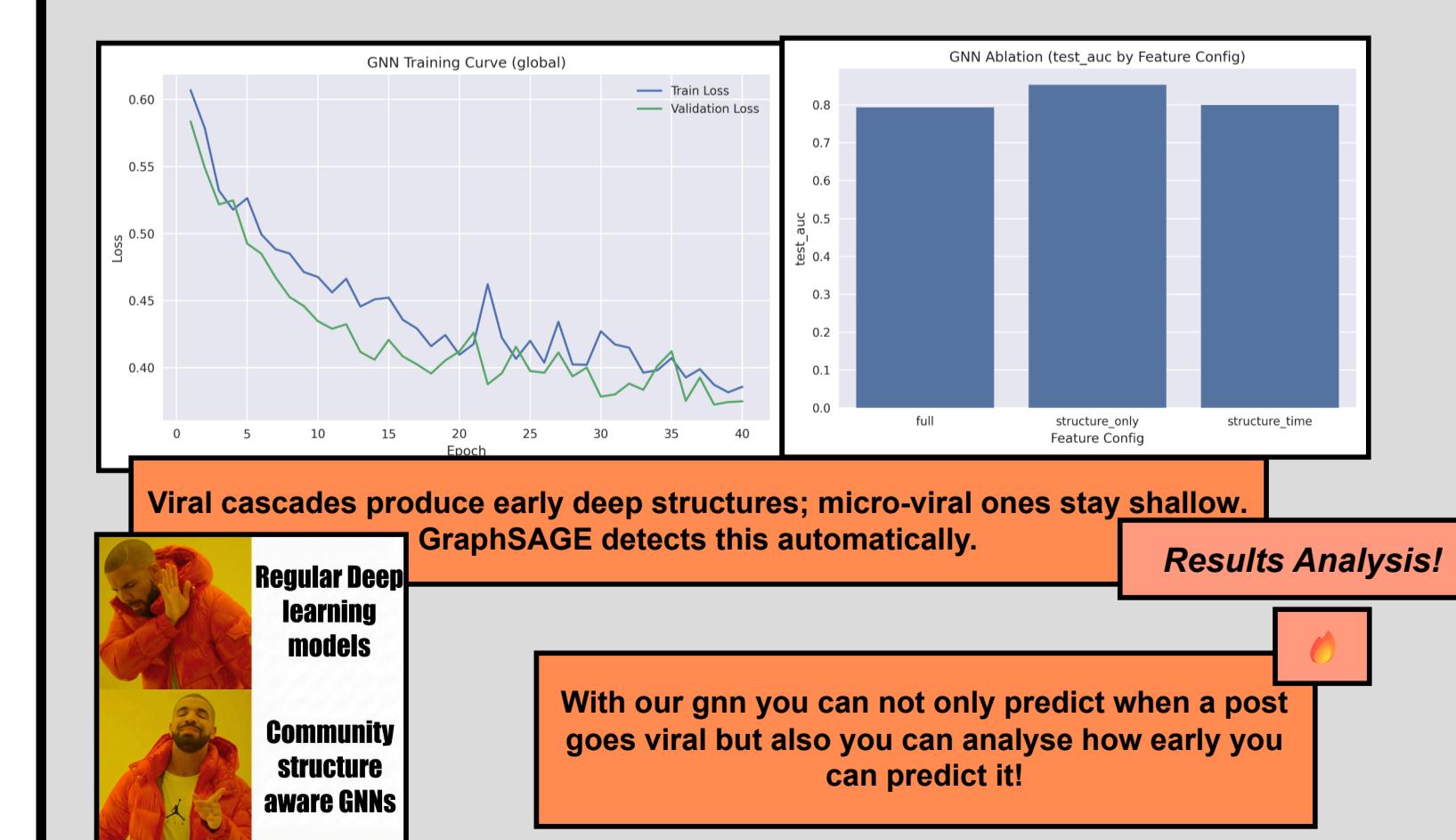
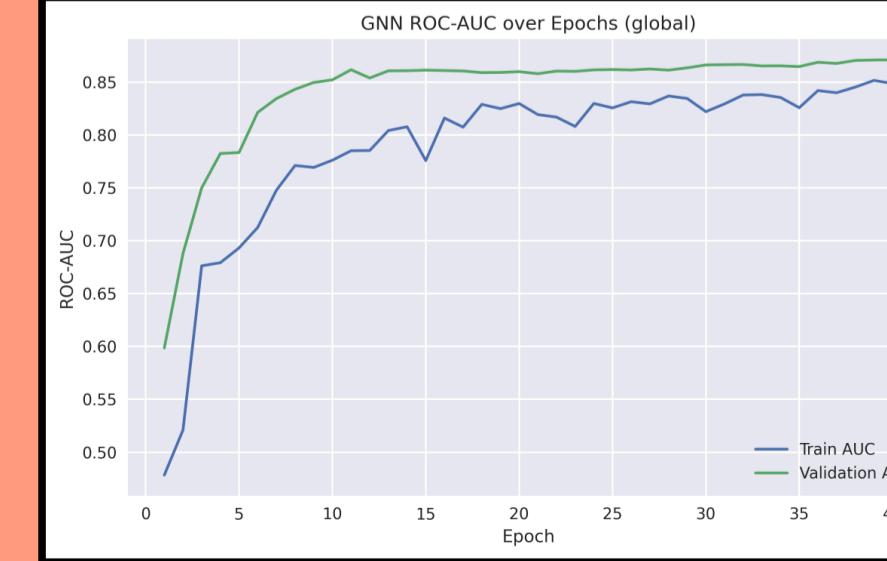
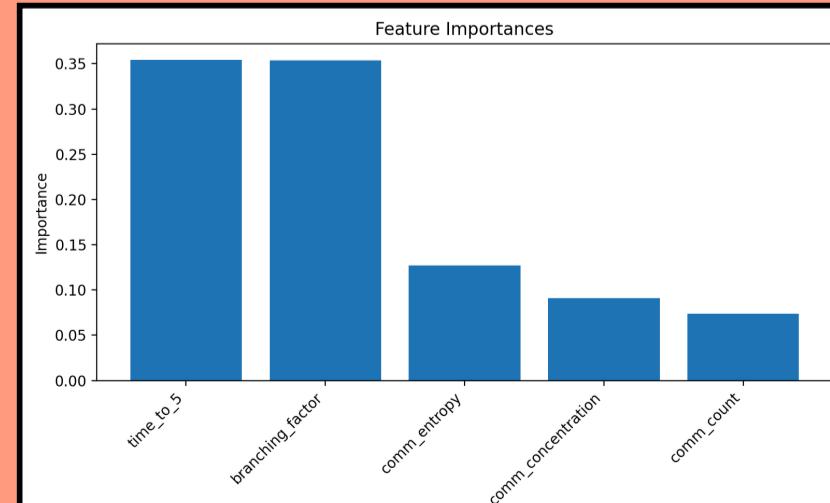


### Feature Plots!



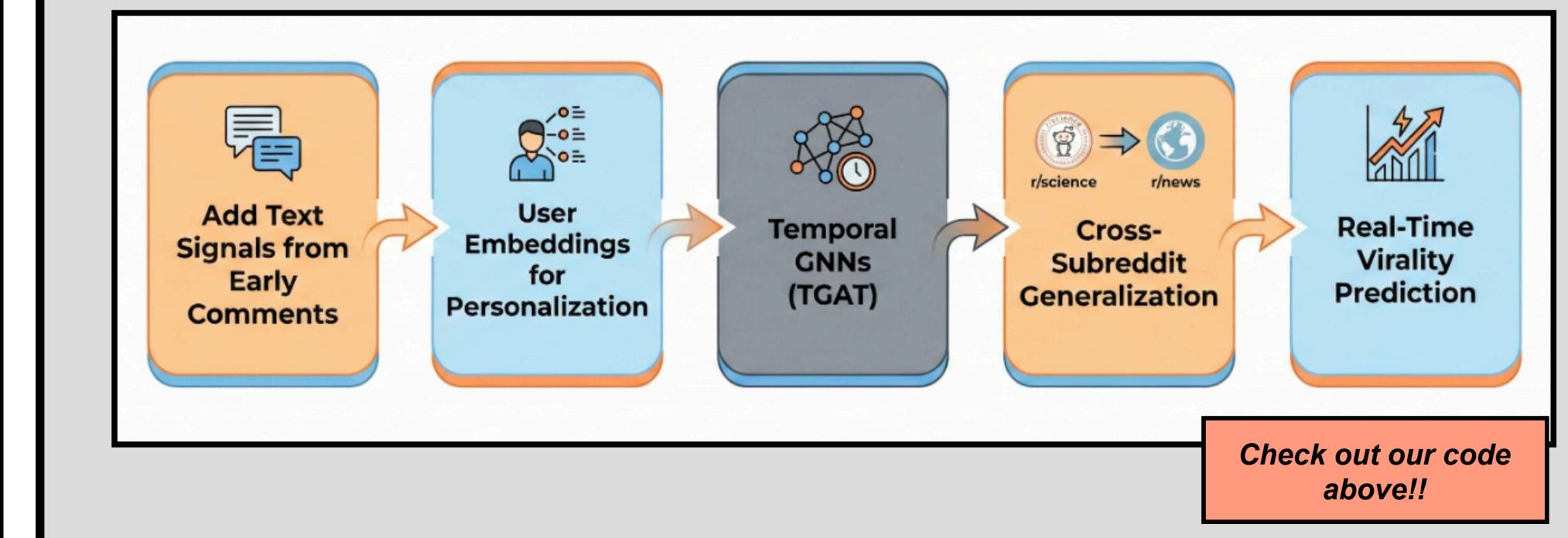
## Whats next?

## Results!



Viral cascades produce early deep structures; micro-viral ones stay shallow. GraphSAGE detects this automatically.

Regular Deep learning models  
Community structure aware GNNs



Check out our code above!!