A Motif-based Approach for Identifying Controversy

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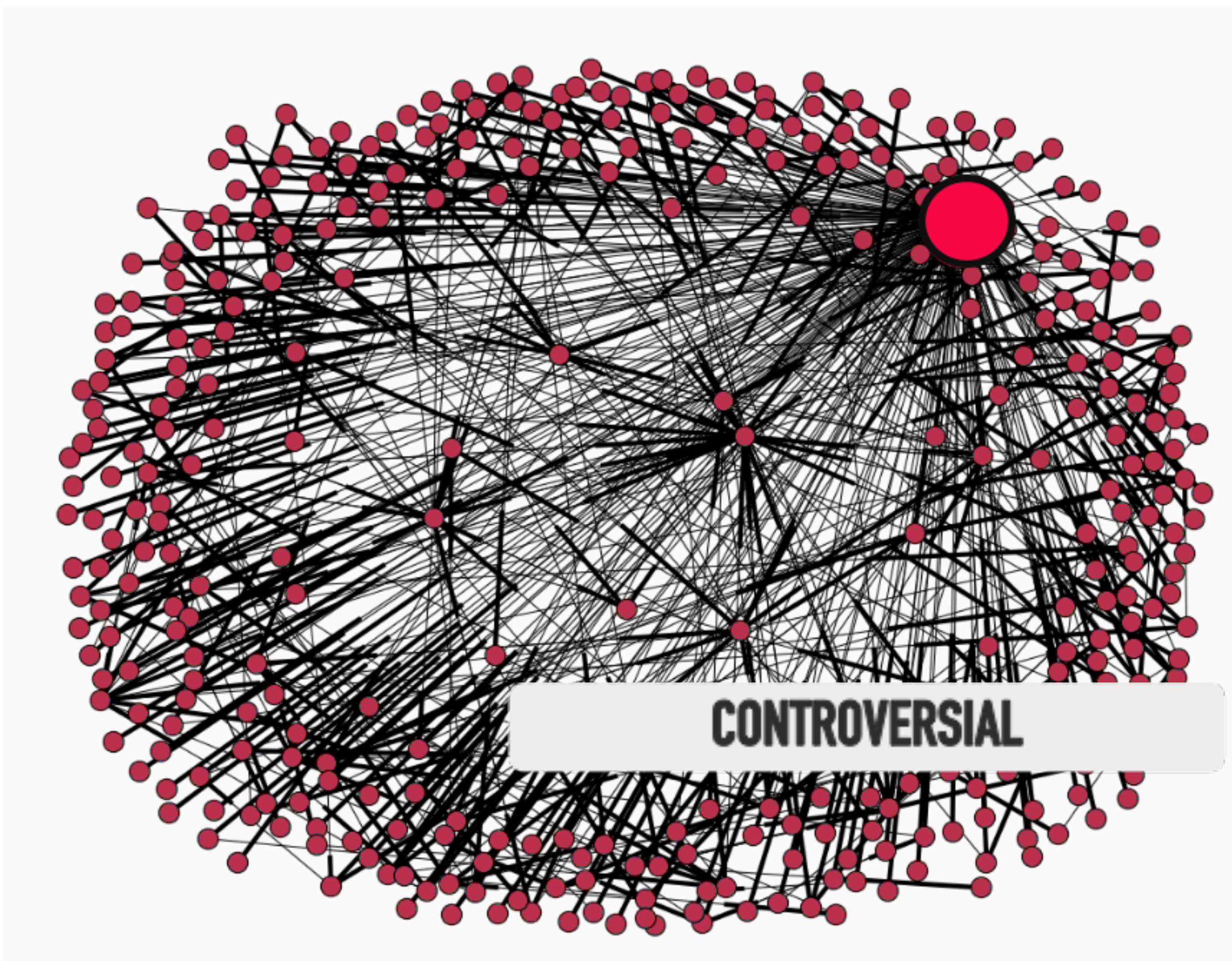
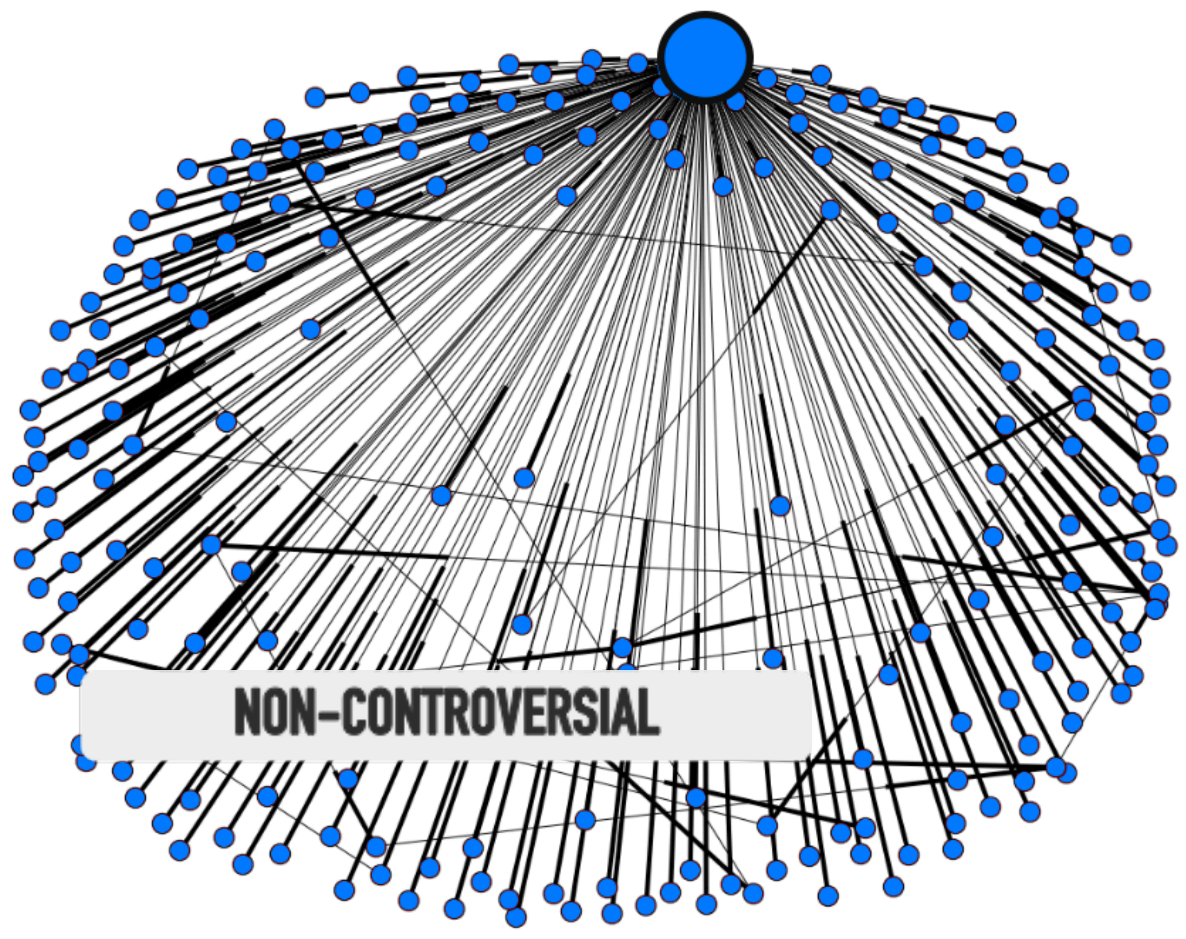
Goal

- Algorithmically identify controversial discussions on Social Media



How

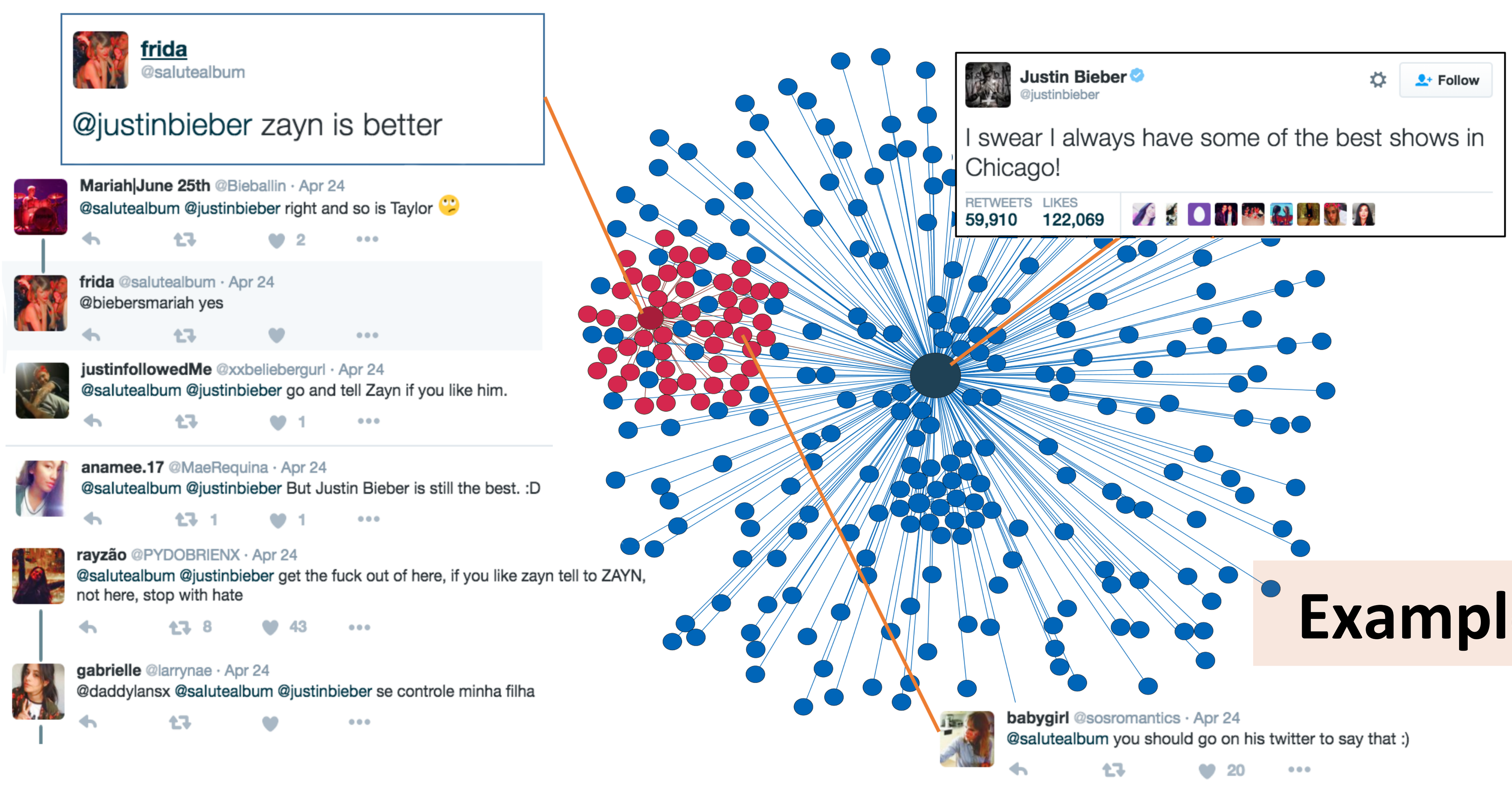
- Exploiting network conversational motifs



Data

Twitter pages			
Filtering	Root posts	Avg. users	Tot. tweets
>2 users	1202	108	192.7K
>3 users	1175 (97%)	110	192.5K
>10 users	1046 (87%)	123	191.3K

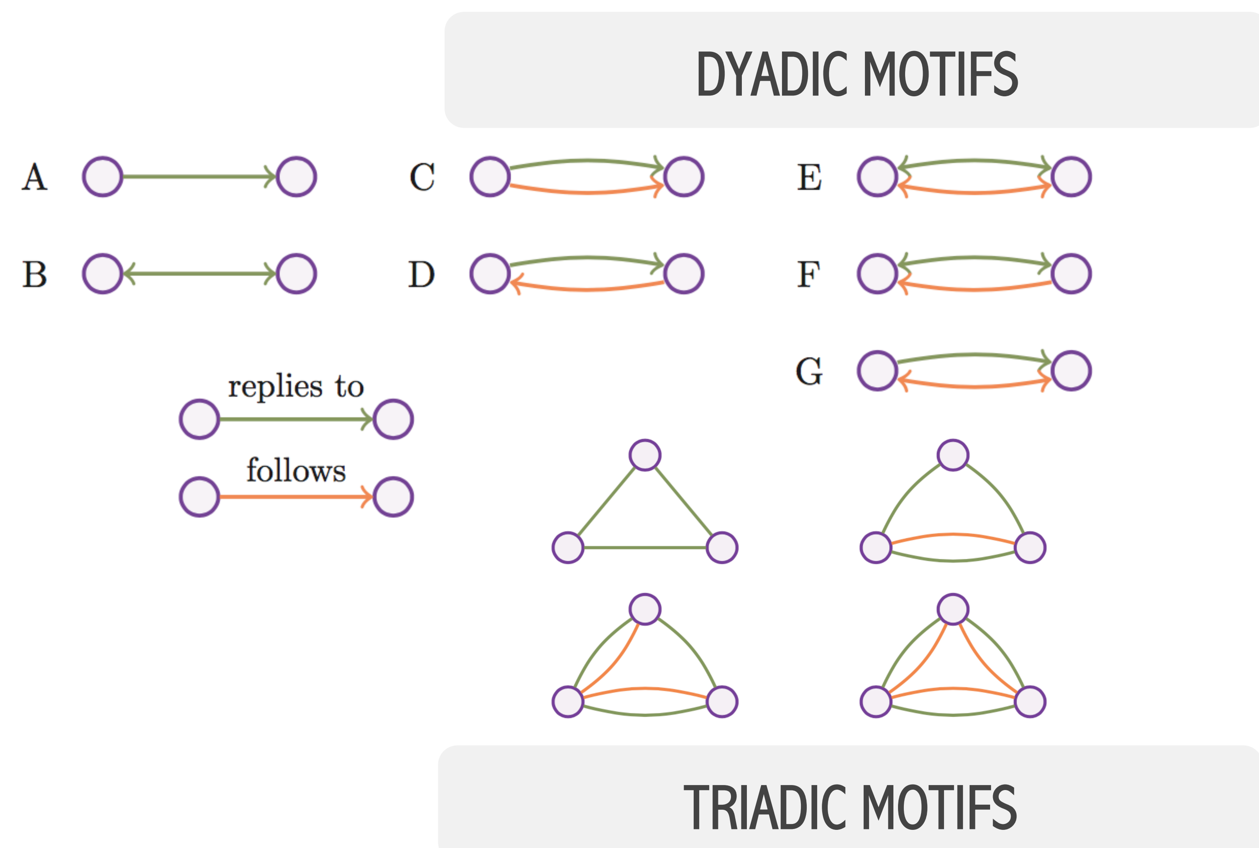
Controversial	@tedcruz, @mov5stelle, @brexitwatch @barackobama, @realdonaldtrump @wikileaks, @berniesanders, @cnnbrk @bbcworld, @hillaryclinton, @potus
Non Controversial	@coldplay, @justinbieber, @cristiano @adele, @chanel, @xbox, @nba



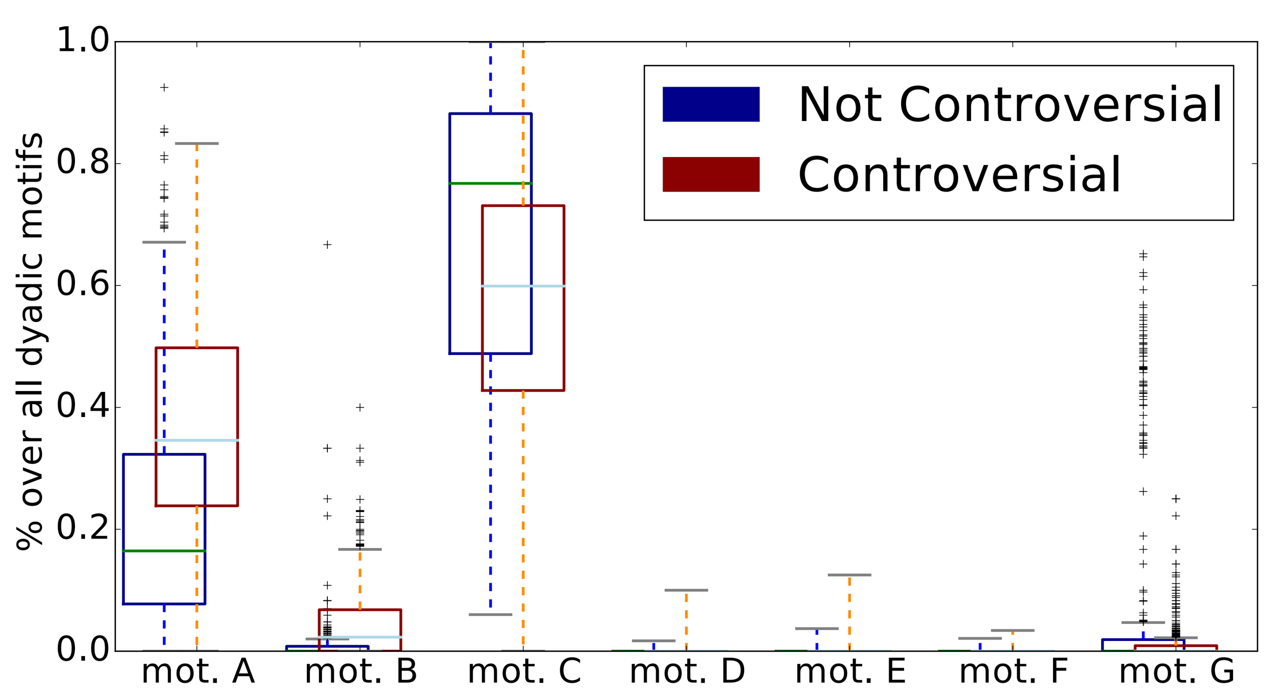
Example

Detail

- Features extracted from the User Graph and from the Reply Tree:
  - **Structural** - e.g. Average Node Degree
  - **Propagation based** - e.g. Average Cascade Depth
  - **Temporal** - e.g. Average Inter-reply Time
  - **Conversational Motifs** – Dyadic and Triadic
- Machine-Learning model: **ADA BOOST**, casted into a classification problem



Results:



Method	Accuracy	Precision	Recall	F-measure
Baseline	**0.78**	0.81	0.83	**0.82**
Dyadic motifs only	**0.77**	0.79	0.84	**0.82**
Baseline + dyadic motifs	**0.84**	0.86	0.88	**0.87**
Baseline + dyadic and triadic motifs	**0.85**	0.87	0.88	**0.87**

+ 9%   + 6%

Best features

1- Avg. inter-reply time
2- Max. relative degree
3- **Motif A**
4- % Replies within 1h
5- **Motif B**
6- **Motif G**

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