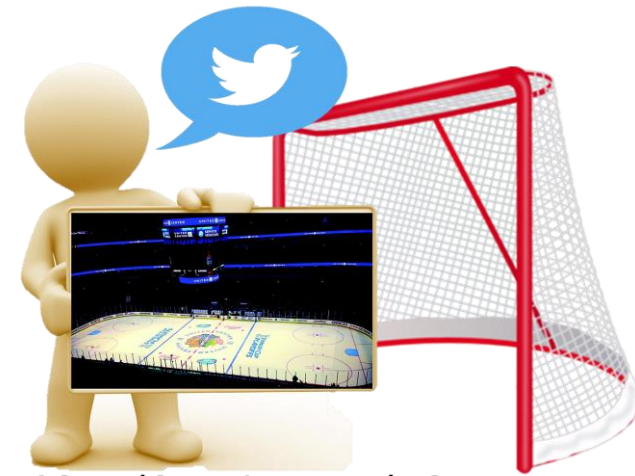


A Second Screen Journey to the Cup: Twitter Dynamics during the Stanley Cup Playoffs

Daniel de Leng, Mattias Tiger, Mathias Almquist,
Viktor Almquist, and **Niklas Carlsson**

Linköping University, Sweden



A Second Screen Journey to the Cup

Motivation



- Social media and micro-blogging service are becoming integral part in many peoples lives
- Many people use their mobile phone as a “**second screen**” during games, TV shows, concerts, and other events
- This allows users to easily interact with people far away, including (to some extent) celebrities that they may not interact with otherwise
- Many broadcasting companies, celebrities, and sports teams have recognized this as a great opportunity to connect with viewers and fans
- Researchers have only begun to analyze this trend and thus far most second-screen studies have focused on TV shows

Contributions at a glance



- The first characterization of the second screen usage over the playoffs of a major sports league
 - National Hockey League (NHL)
 - Stanley Cup playoffs
- Both temporal and spatial analysis of the Twitter usage during the end of the NHL regular season and the 2015 Stanley Cup playoffs
- Analysis provides insights into the usage patterns over the full 72-day period, with regards to in-game events such as goals, and with regards to geographic biases, for example, ...
- Quantifying these biases and the significance of specific events, we identify important playoff dynamics impacting advertisers and third-party developers wanting to provide increased personalization

Background, methodology, and dataset

Introducing Lord Stanley, the oldest and “best” trophy in professional sport ... (*)



... and my own journey to the cup ...

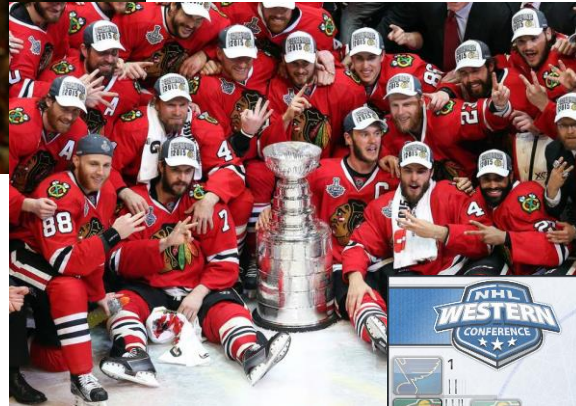
... true happiness during visit with the cup!



... a second attempt ...



The big guys journey to the Cup

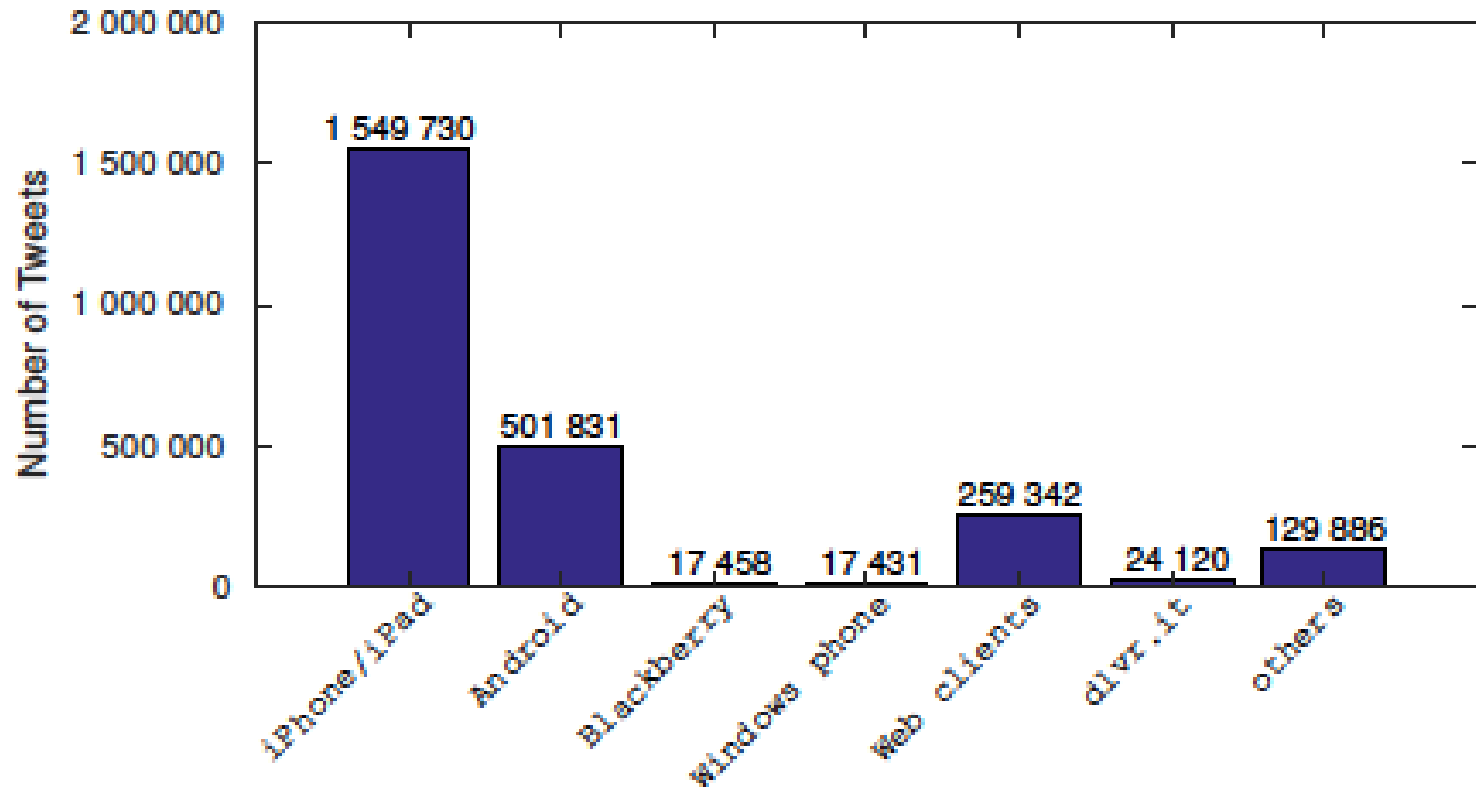


Data collection

- Use Twitter Streaming API
 - Subscribe to tweets including certain hashtags/keywords
 - 1% “firehose” sometimes come into effect, but at those times we know missed volume
- Adapt the set of #hashtags we follow on a daily basis
 - Official hashtags for all NHL teams
 - Per-day specific tags based on today’s games
 - Update tags during low-activity hours (morning in America)
- For set of example games, we also collect detailed per-minute information about goals, etc.

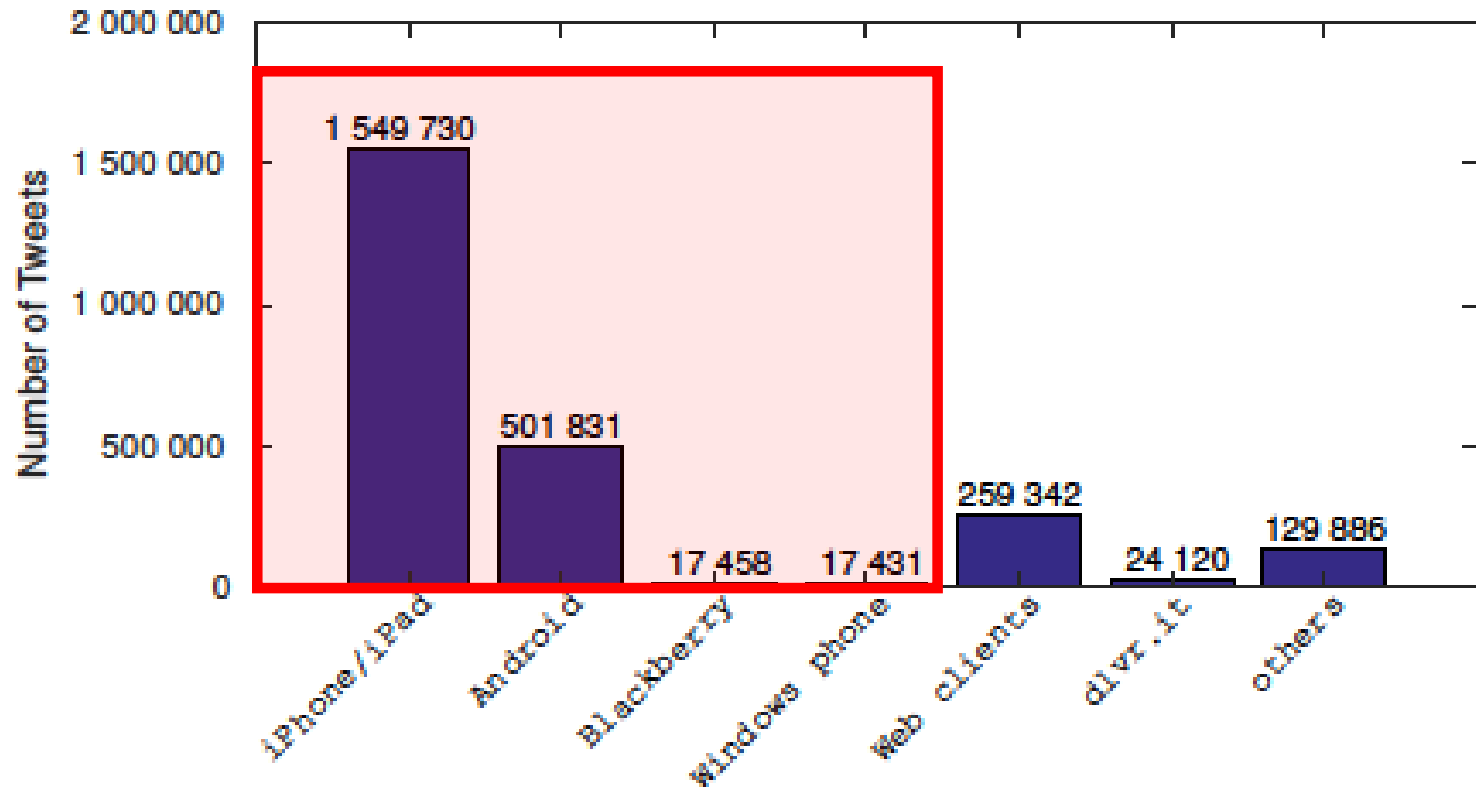
Second screen usage

Mobile clients



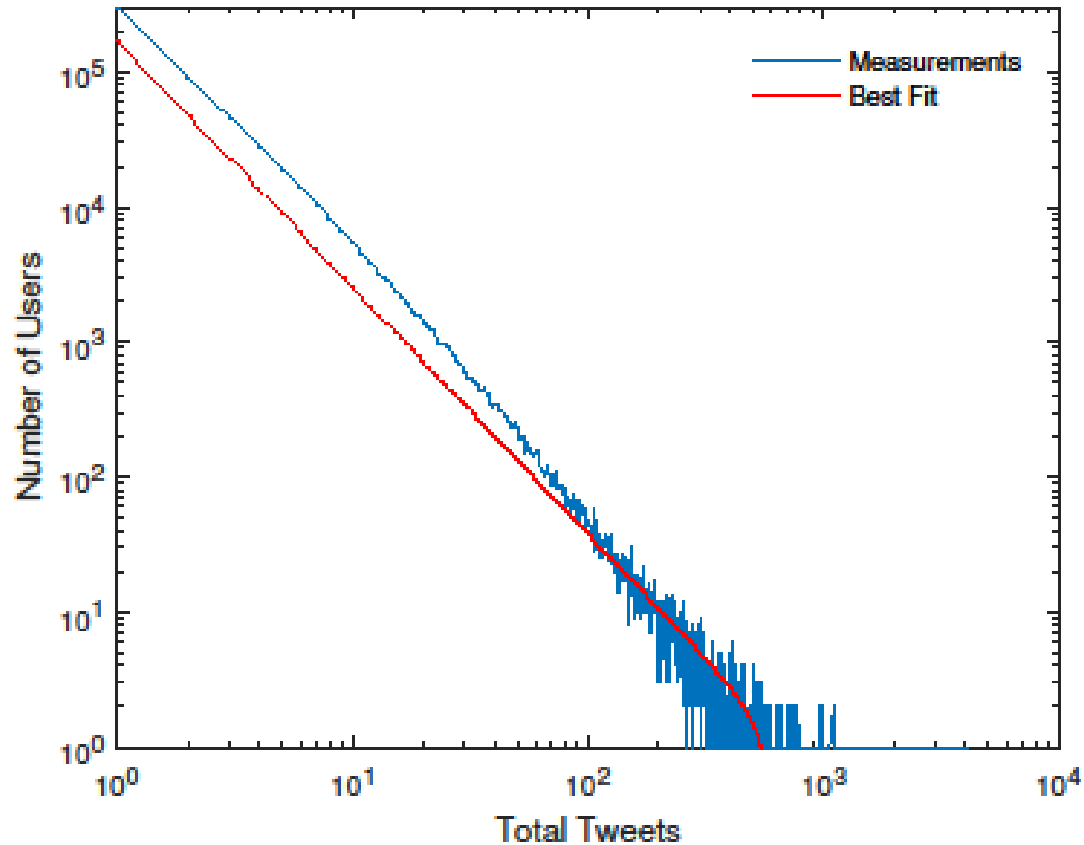
- Majority (88%) of these tweets are from mobile devices
 - With iPhone/iPad and Android leading the way ..
- Together with high twitter activity at time of in-game events, this supports that twitter is used as a second screen

Mobile clients



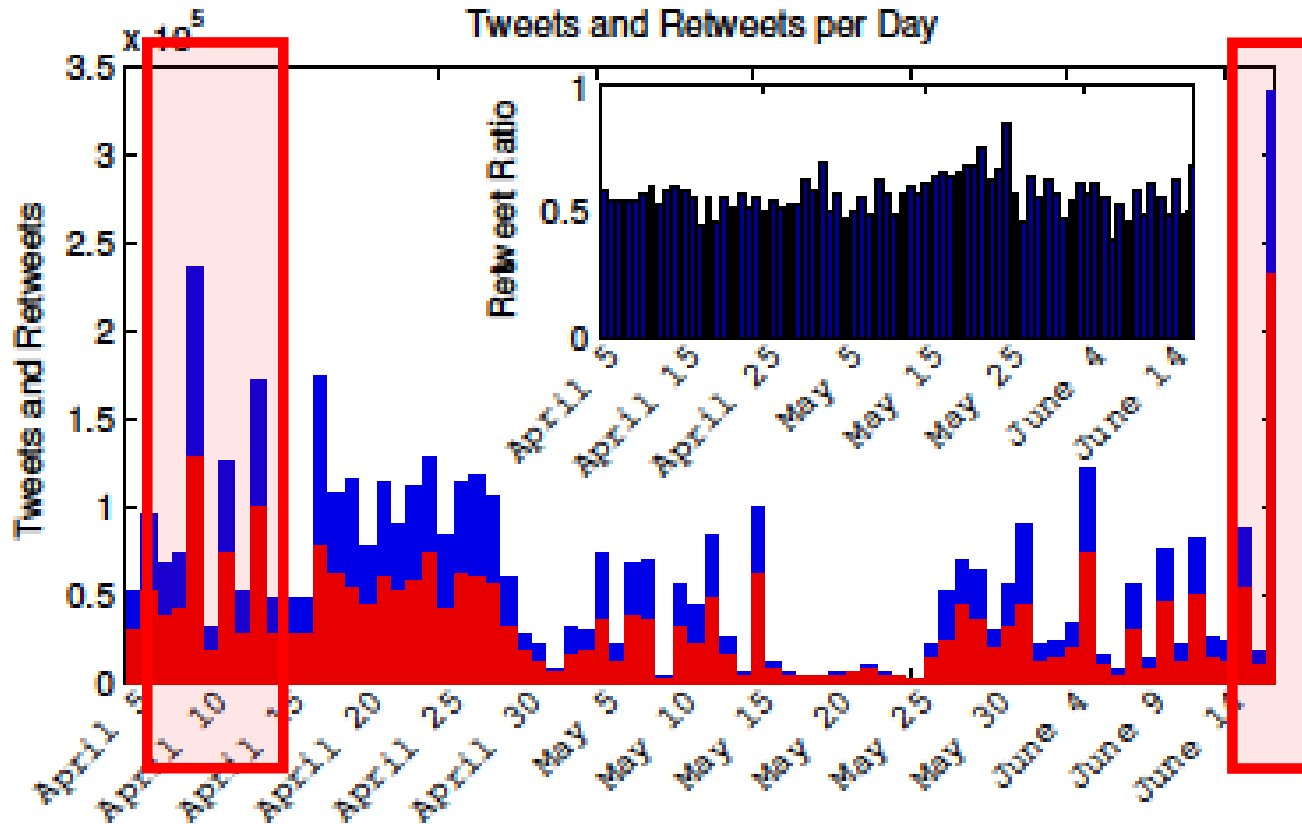
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Skewed usage



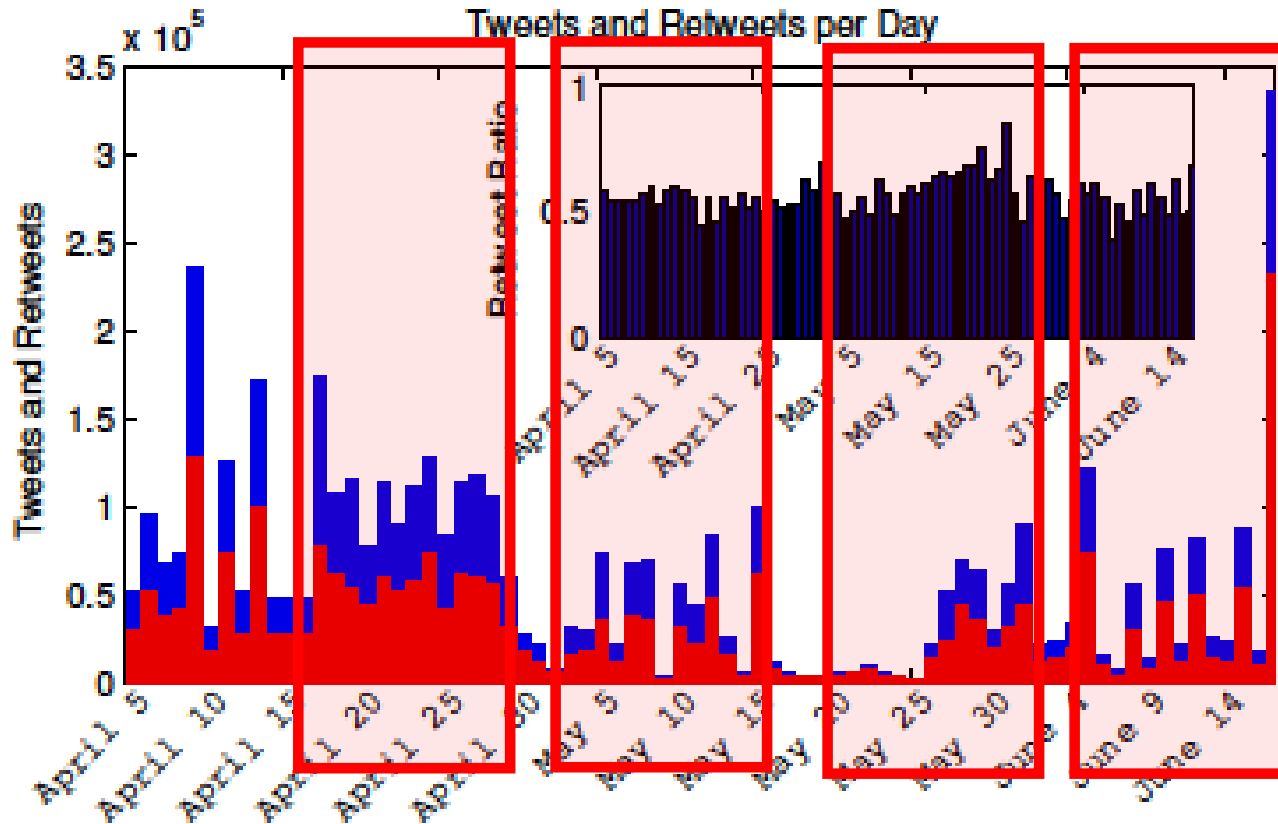
- Tweets per user follows power-law relationship
 - Clear linear relationship on log-log scale

Longitudinal usage and type of tweets



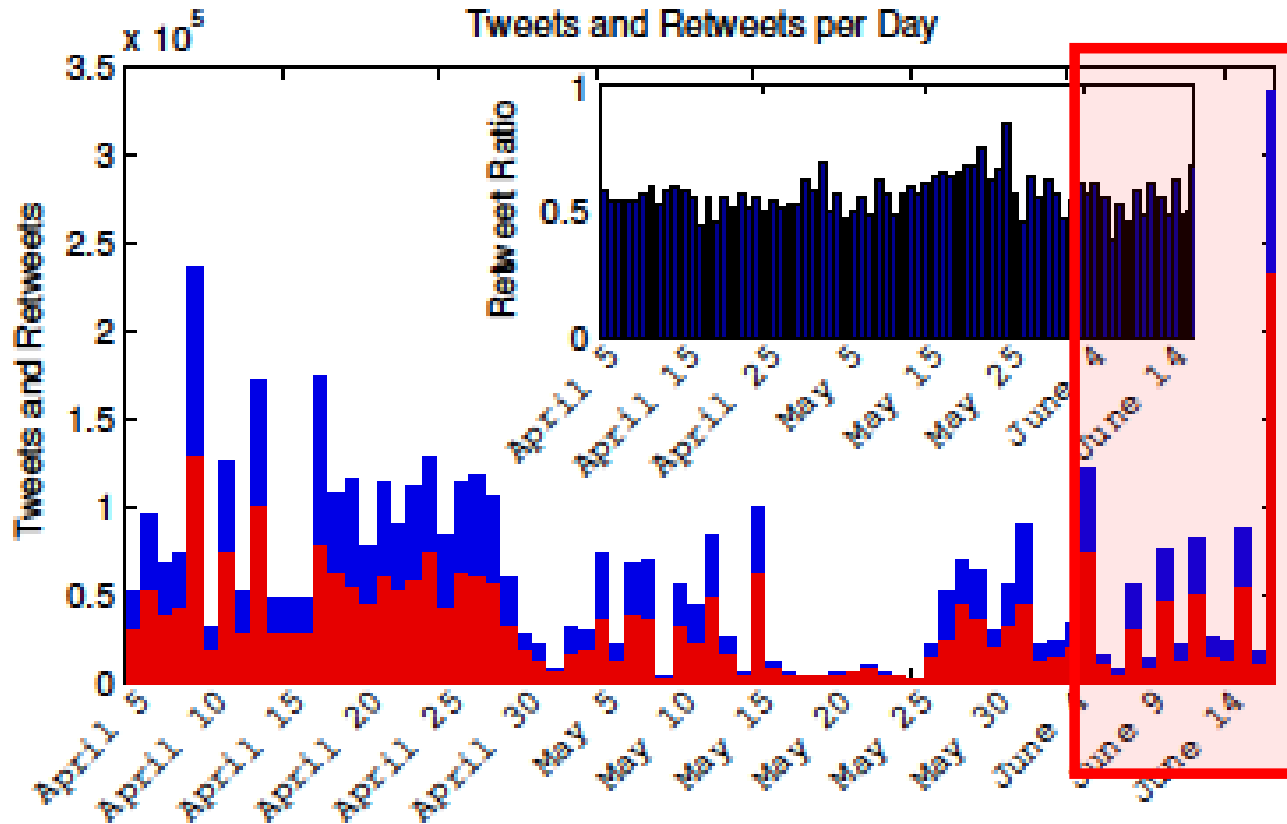
- Highest activity the last days of regular season and last day of playoffs
- User engagement went down as teams were eliminated
- Interest increased again for finals; six clear spikes (one for each game)

Longitudinal usage and type of tweets



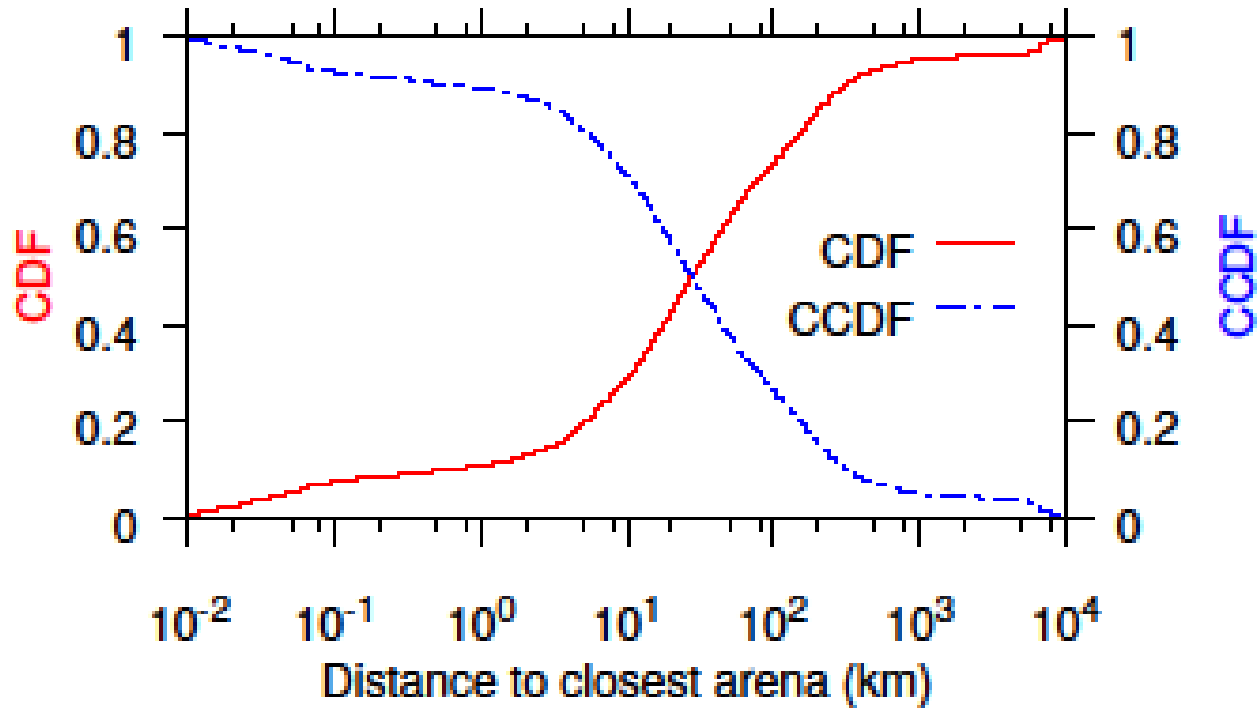
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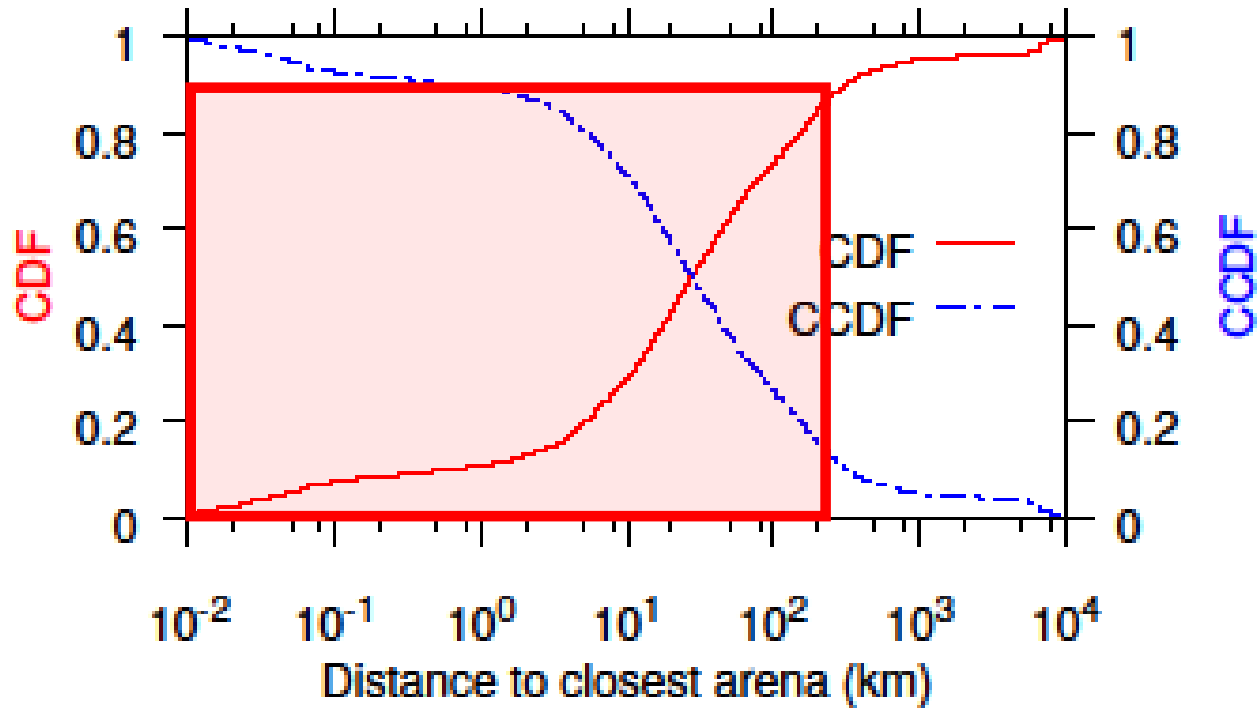
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Location of tweeters: Distance to closest arena



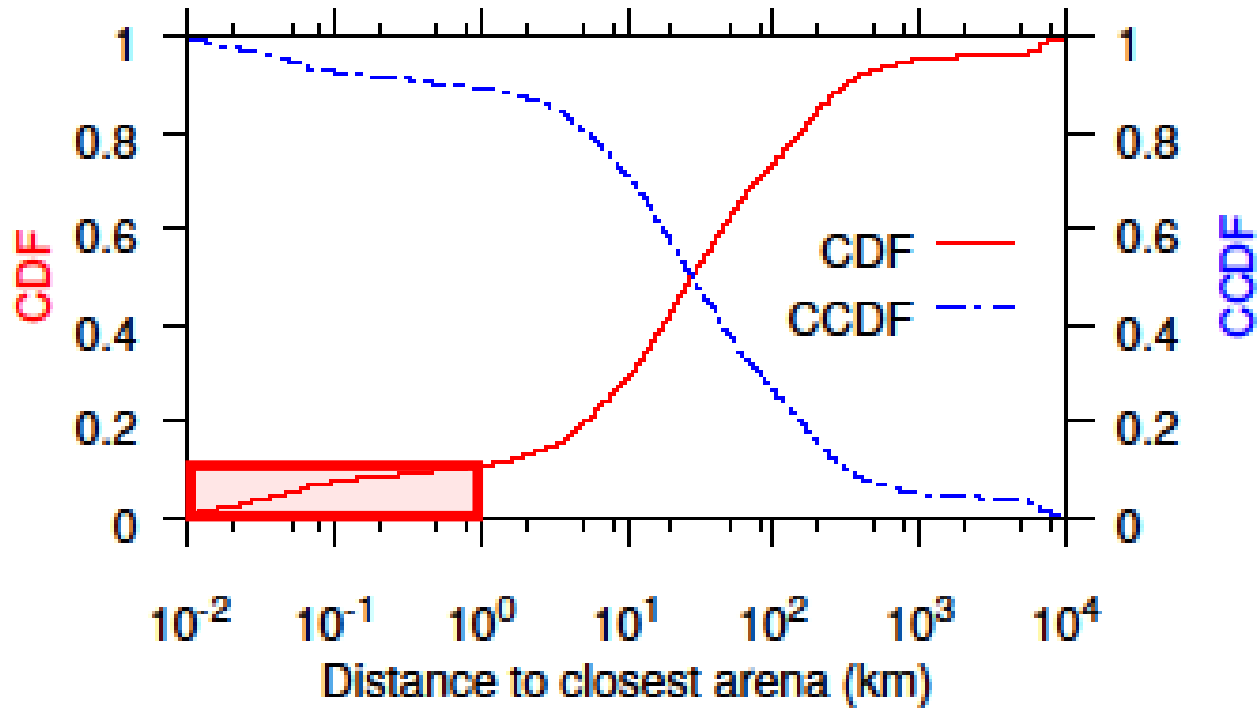
- Most tweets from close to city with NHL team
 - E.g., 50% within 17.8 km and 90% within 324 km of closest arena
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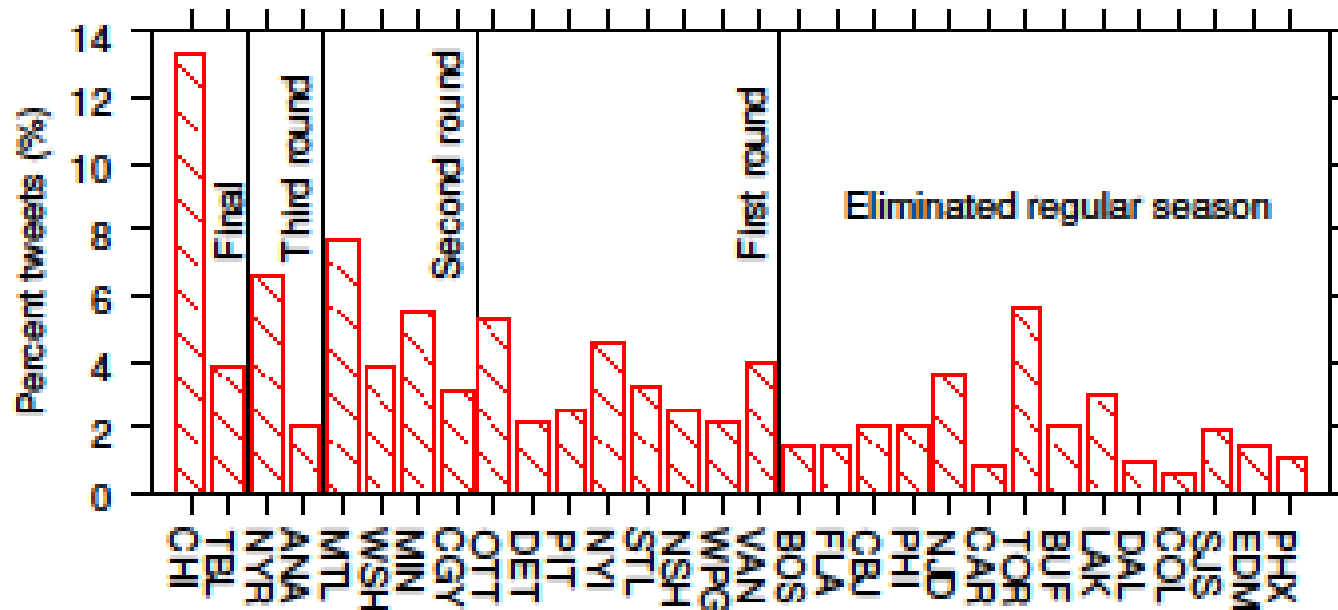
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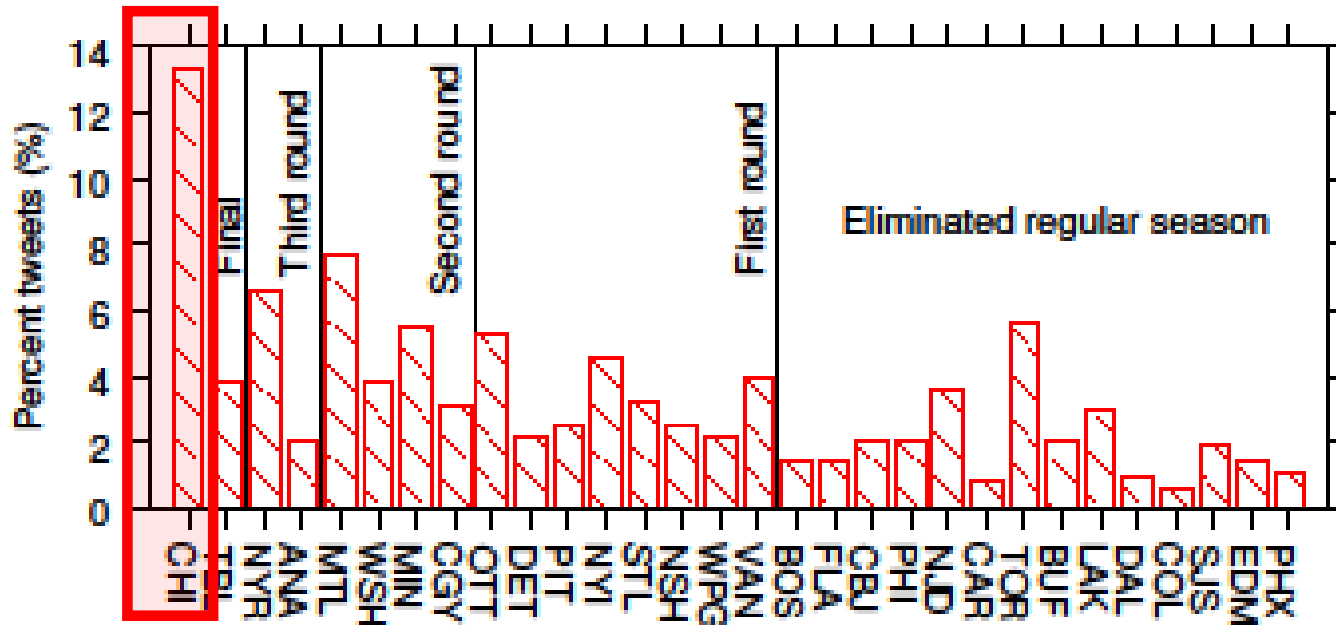
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Location: Fading interest after elimination



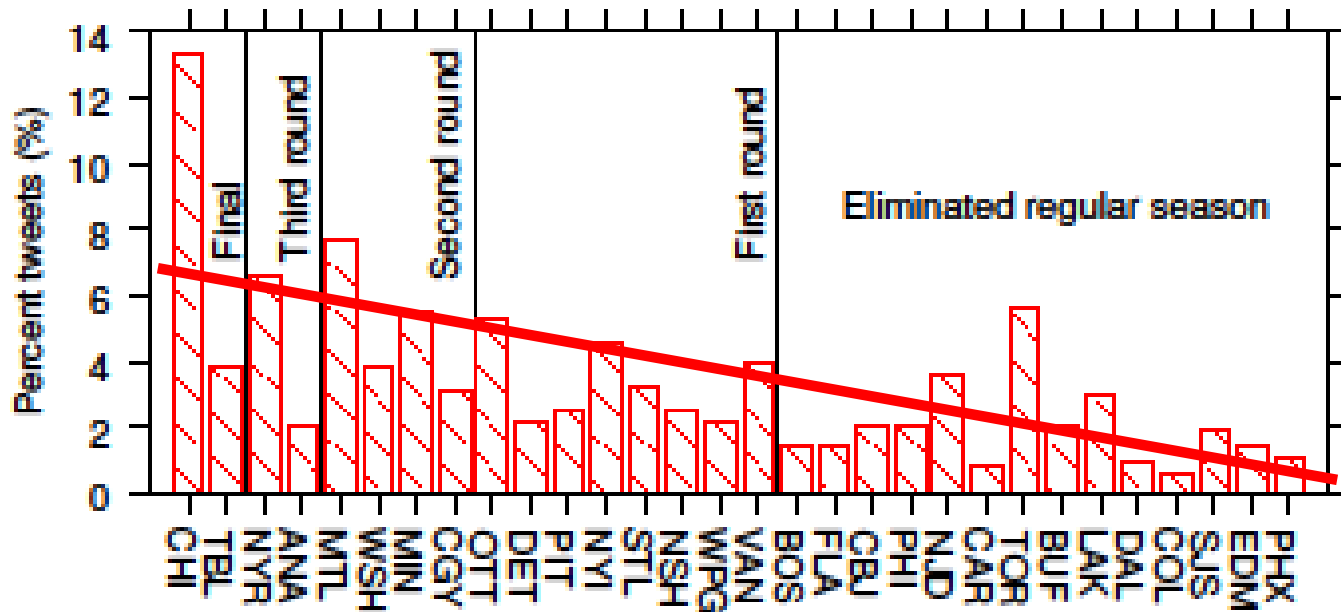
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- Interest highest in cities with teams that went further
- Peaks associated with Canadian playoff cities and traditional hockey markets (e.g., NYR, MTL, MIN, OTT, NYI, TOR)

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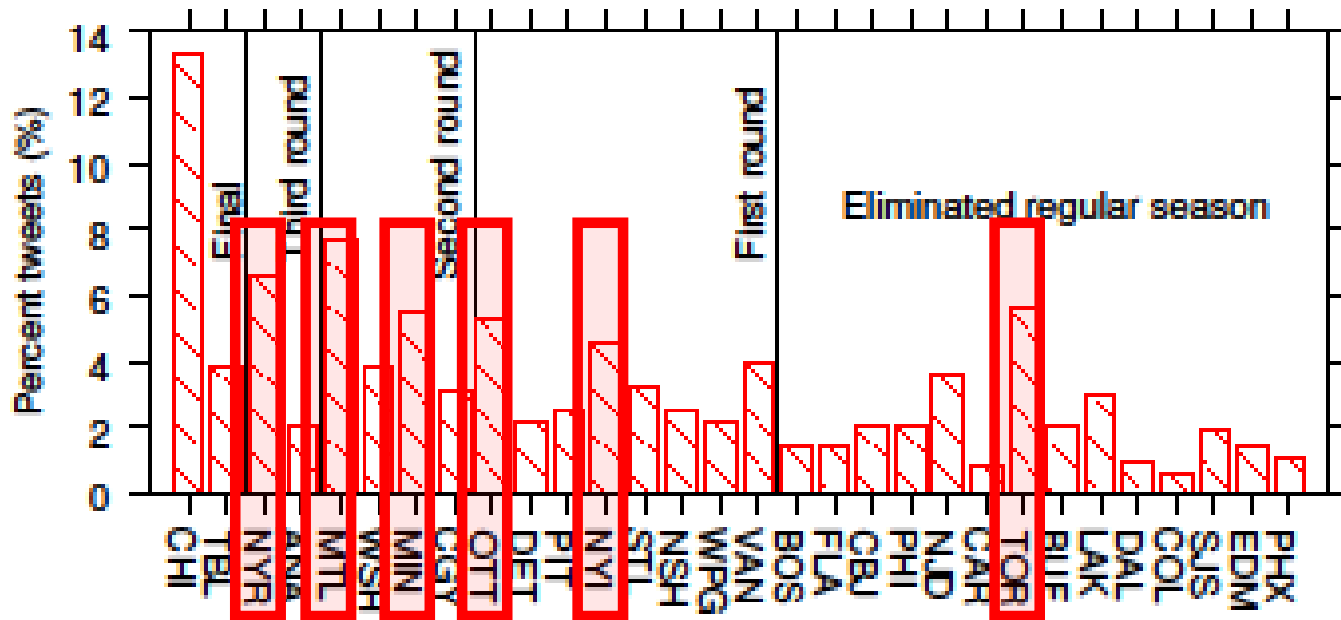
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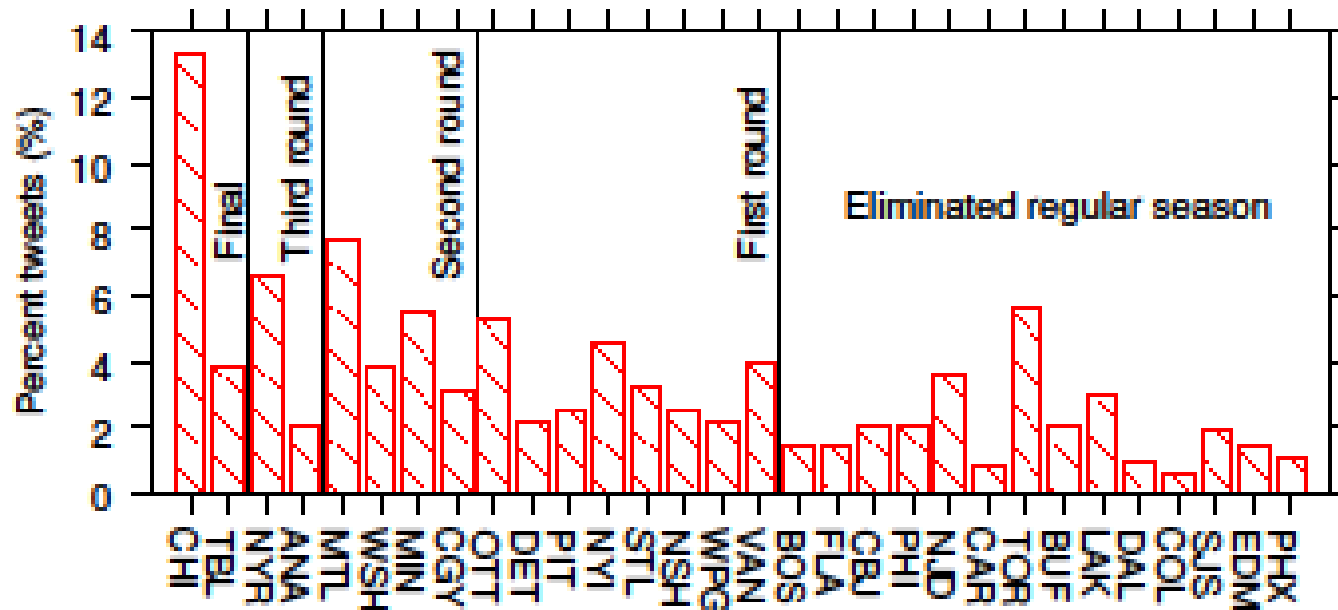
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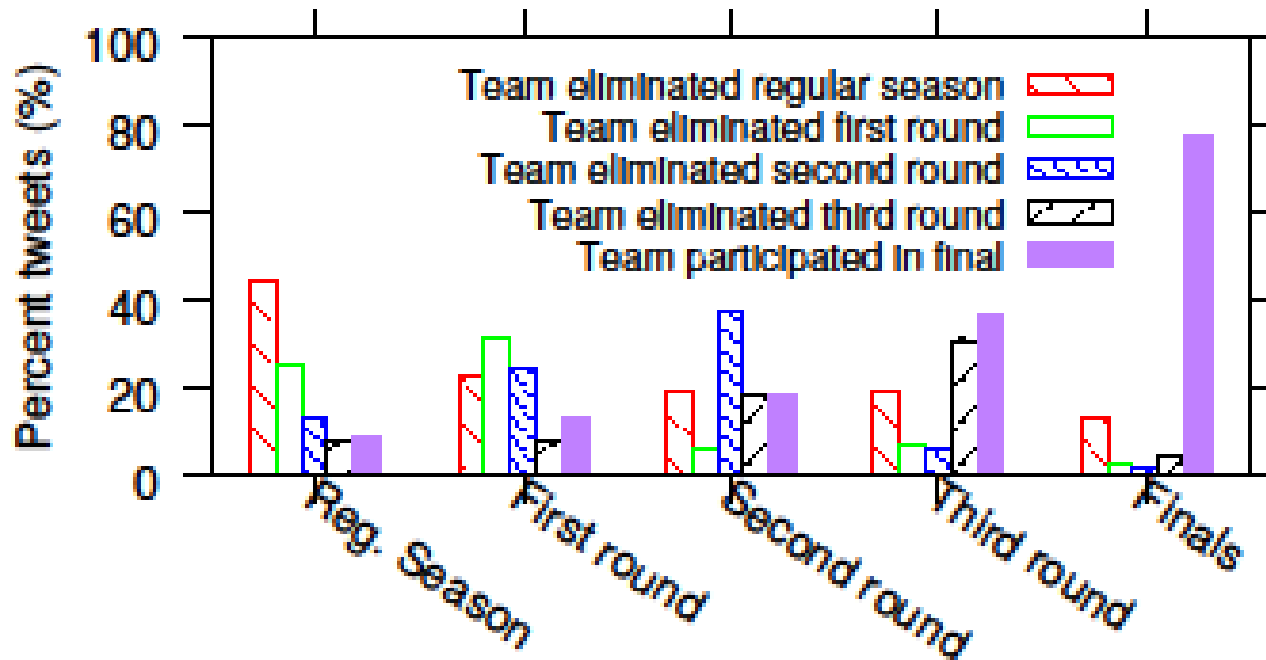
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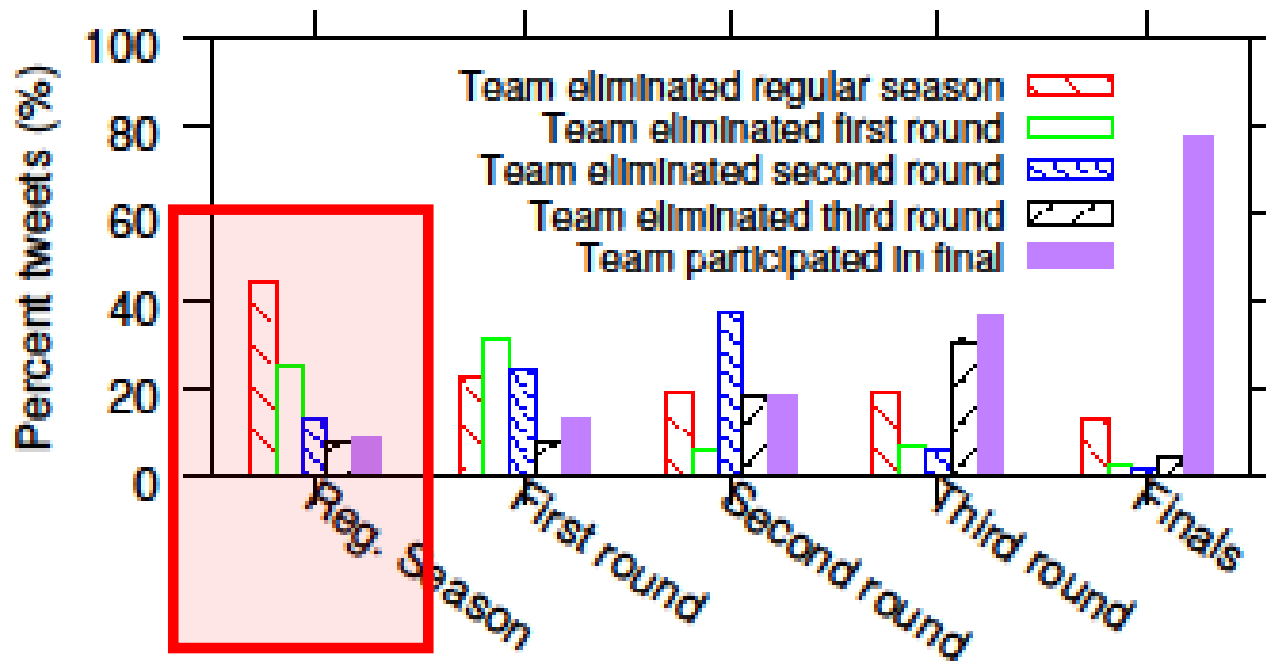
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Tweet volumes during each round



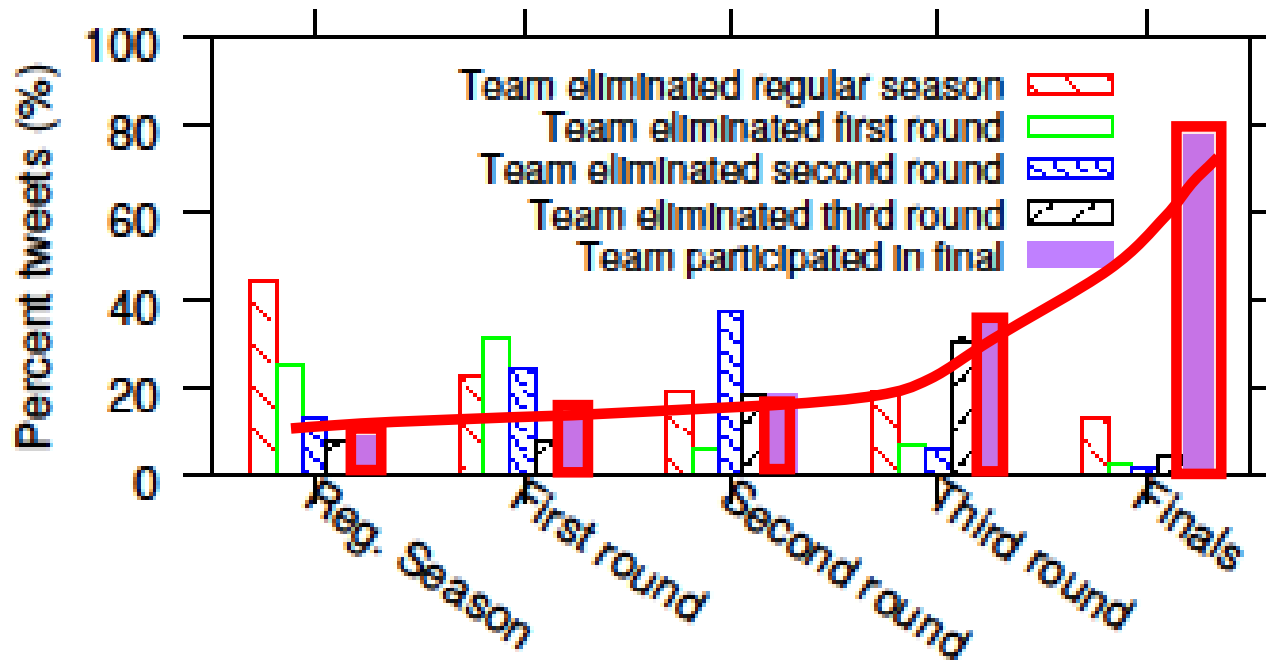
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- Steady increase in interest for teams reaching final
- Increased interest for participating teams of each round
- Reduced interest among eliminated teams

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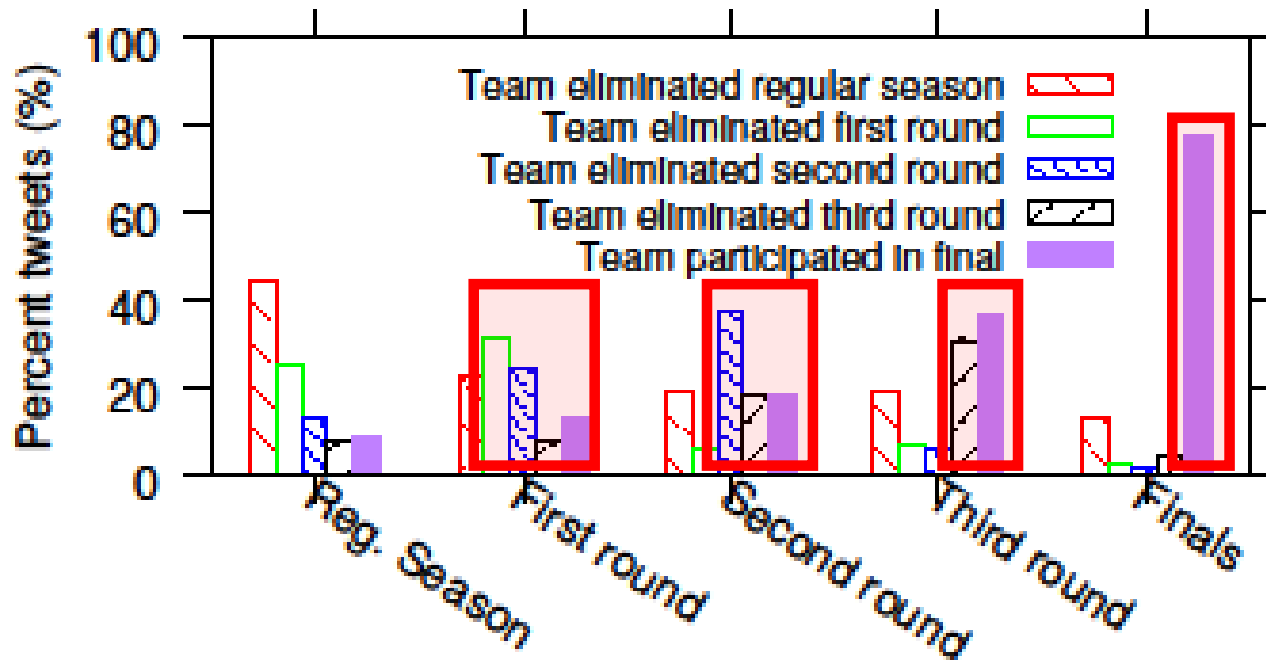
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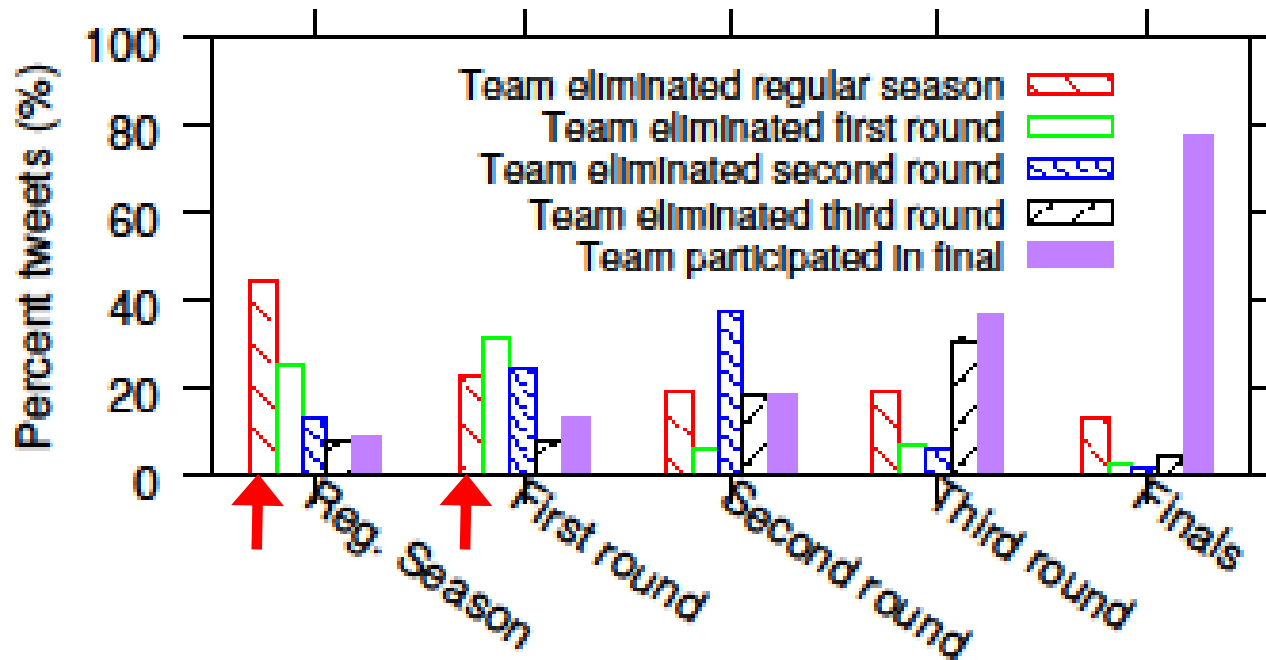
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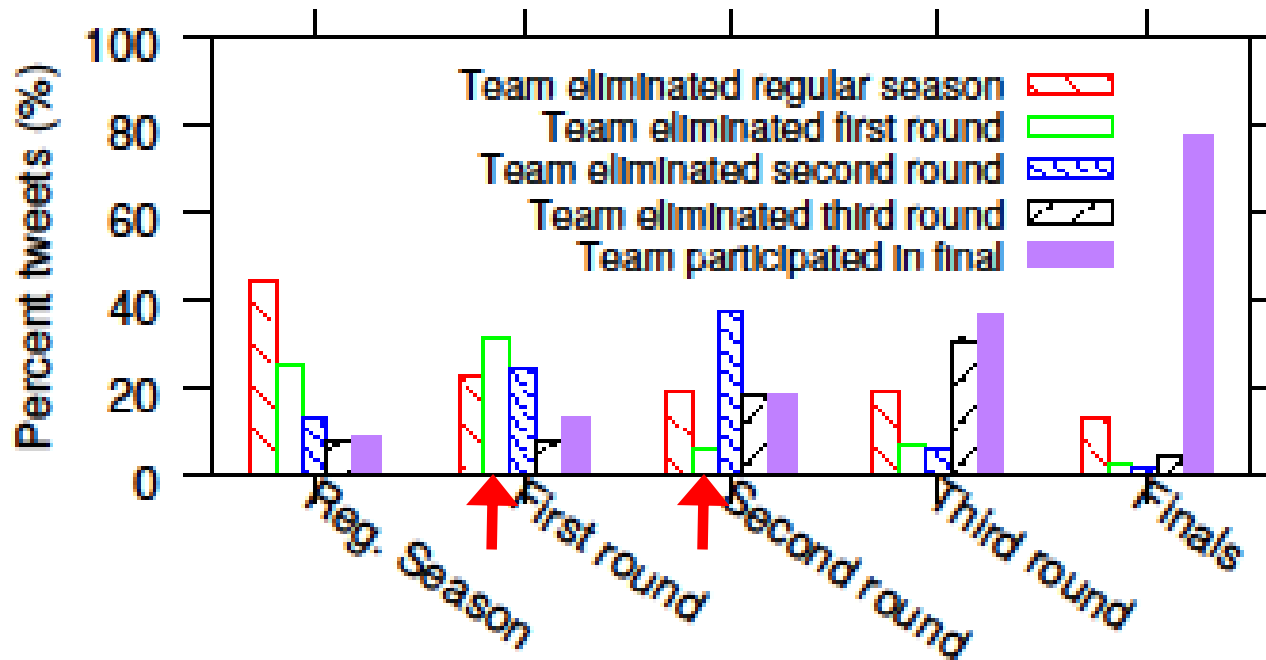
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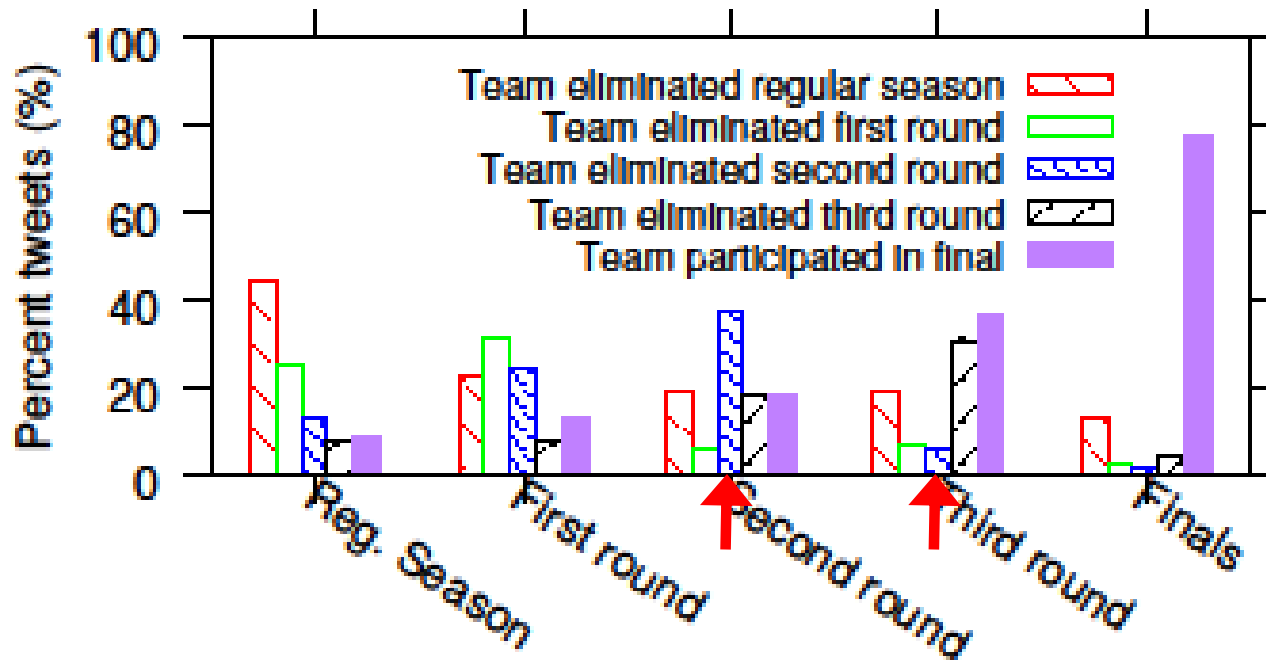
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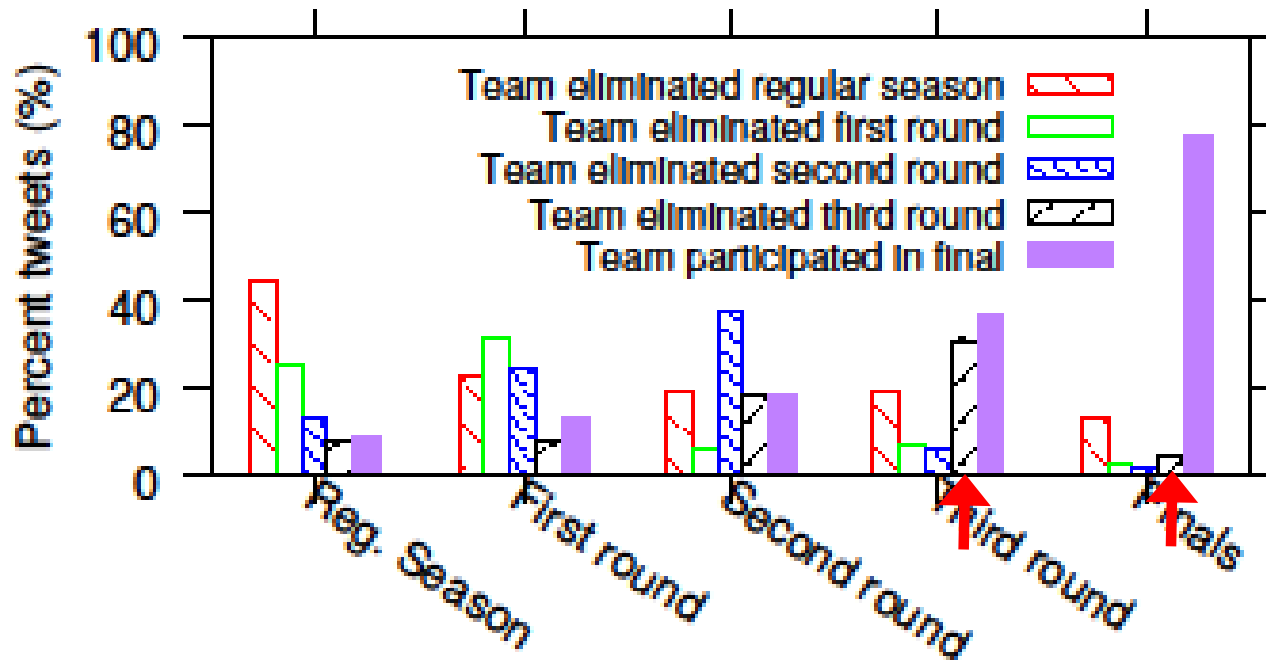
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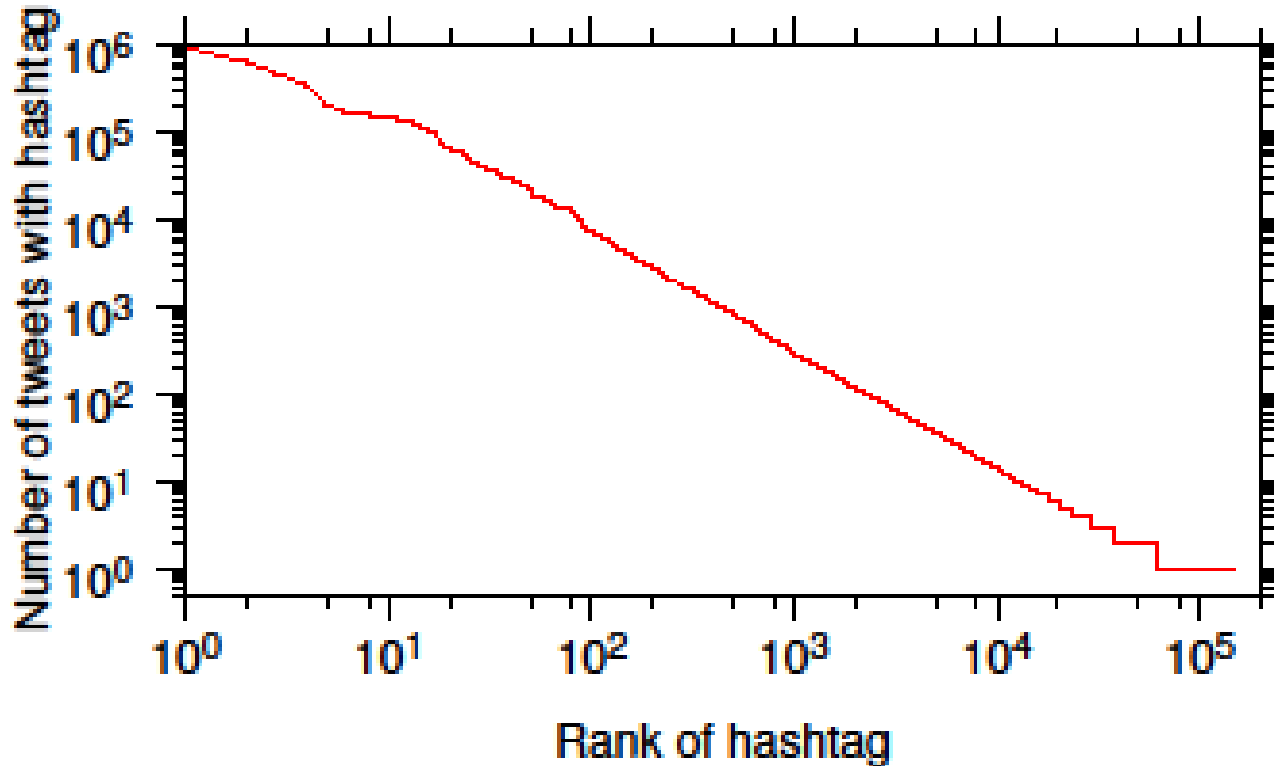
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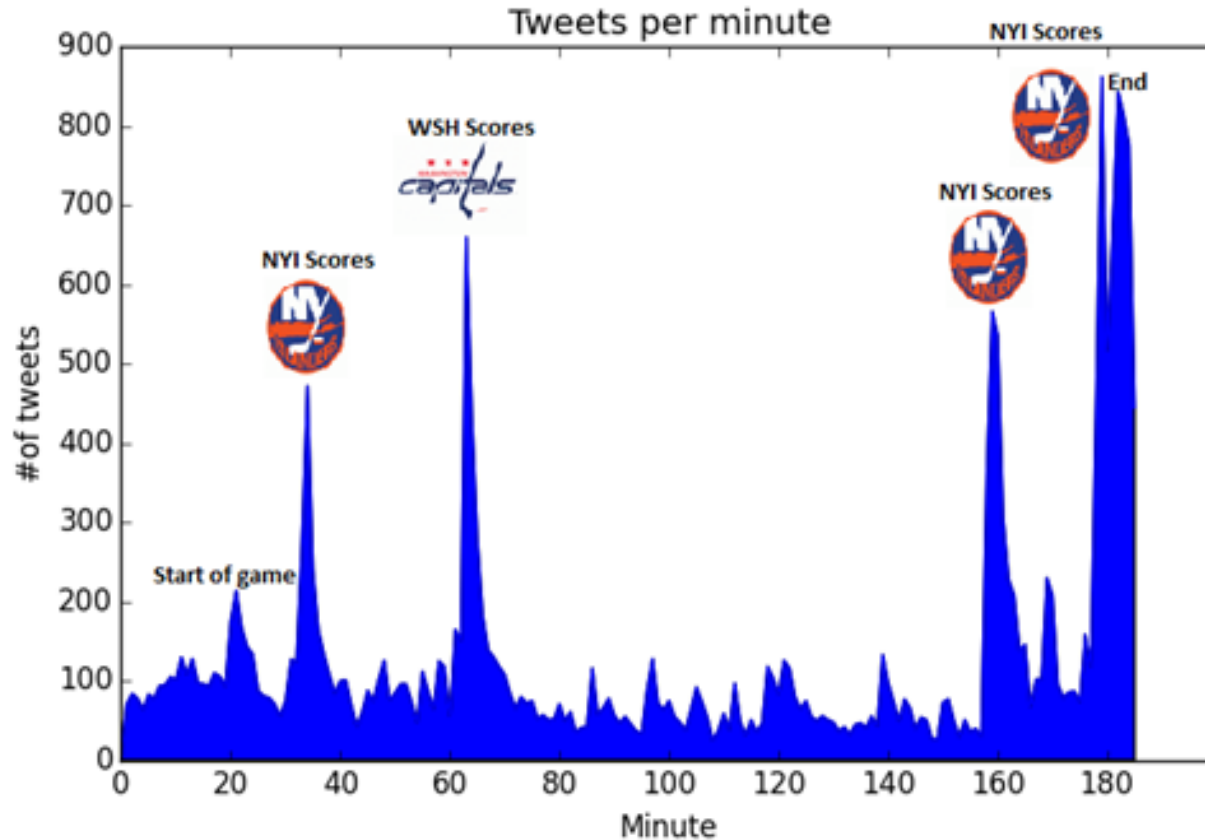
Hashtag usage



- Zipf-like popularity skew of hashtags
- Most frequent hashtags associated with the same teams as dominated the geo-based analysis ...

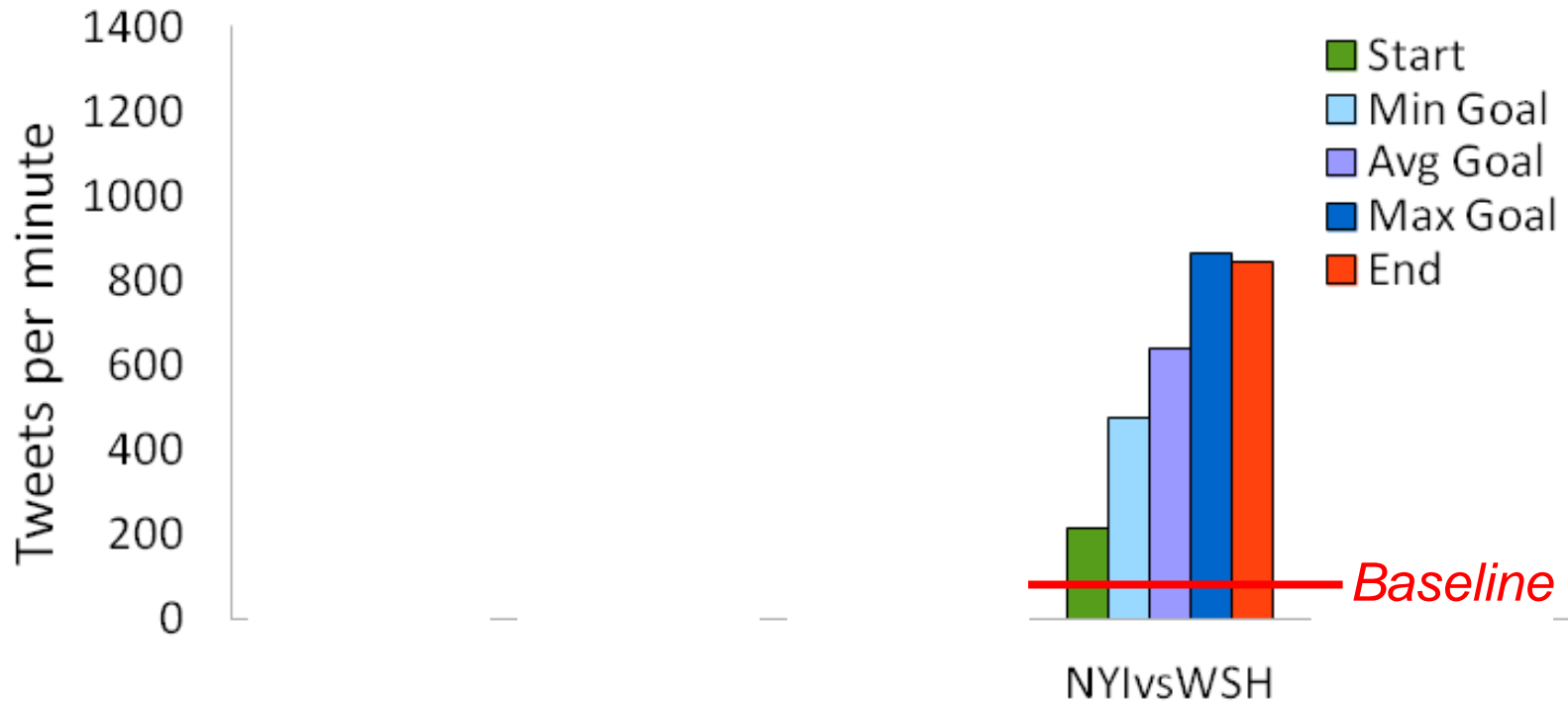
Per-game analysis

Tweet spikes during example game



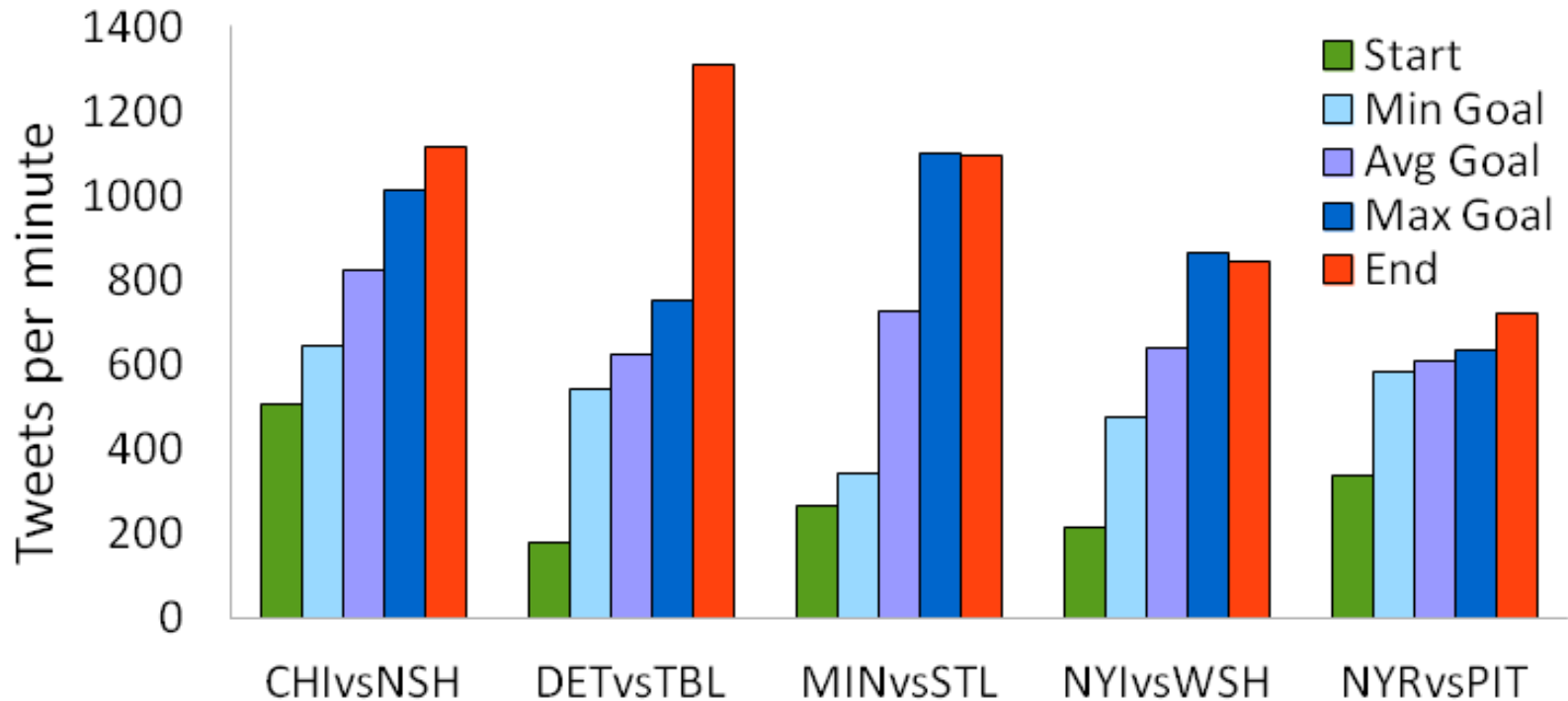
- Significant spikes when goals and at the end of the game

Tweets per minute during in-game events



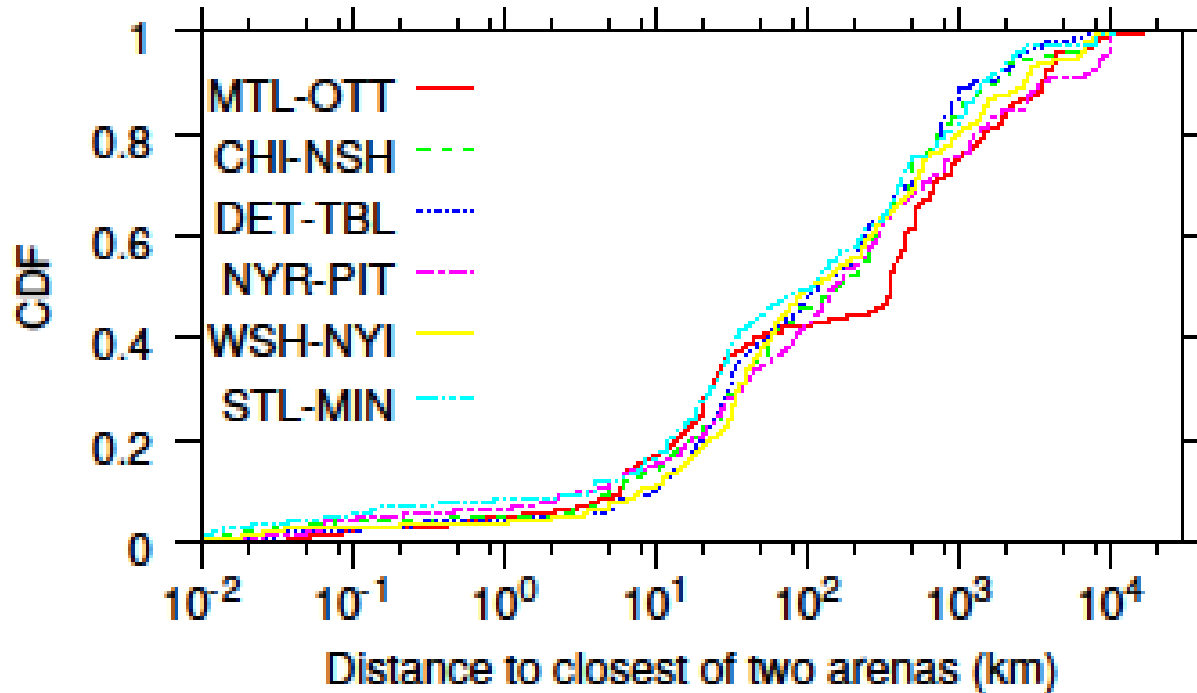
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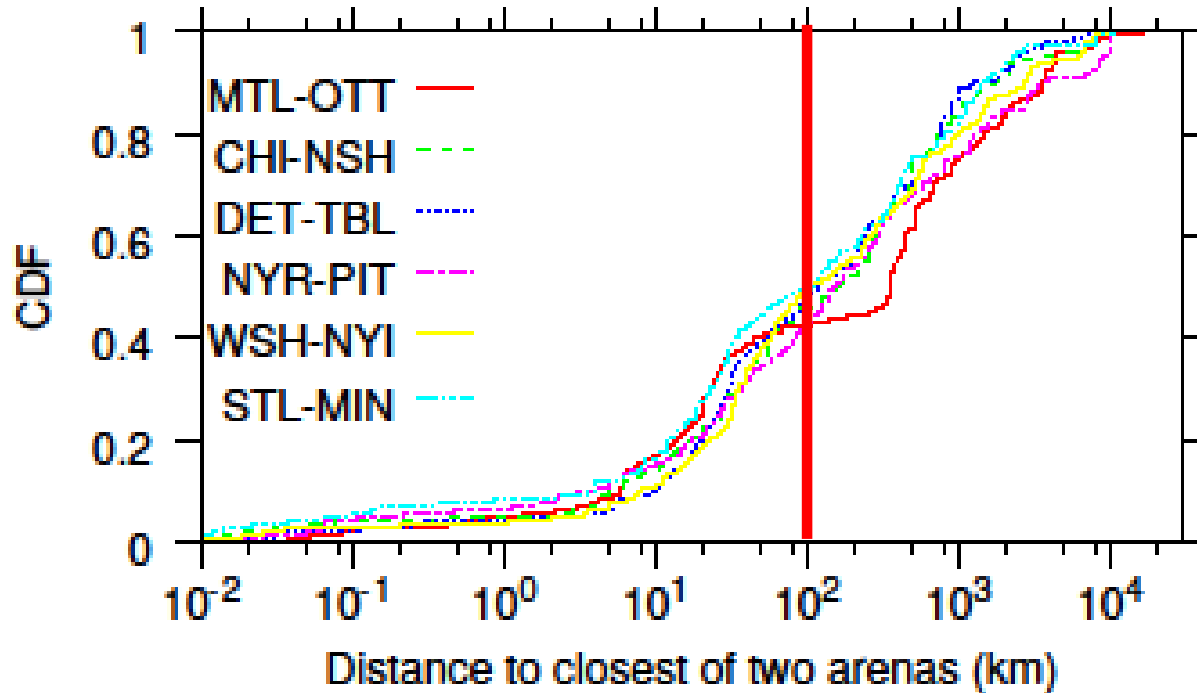
- Significant spikes when goals and at the end of the game
- Similar observations for other games

In-game location-based analysis



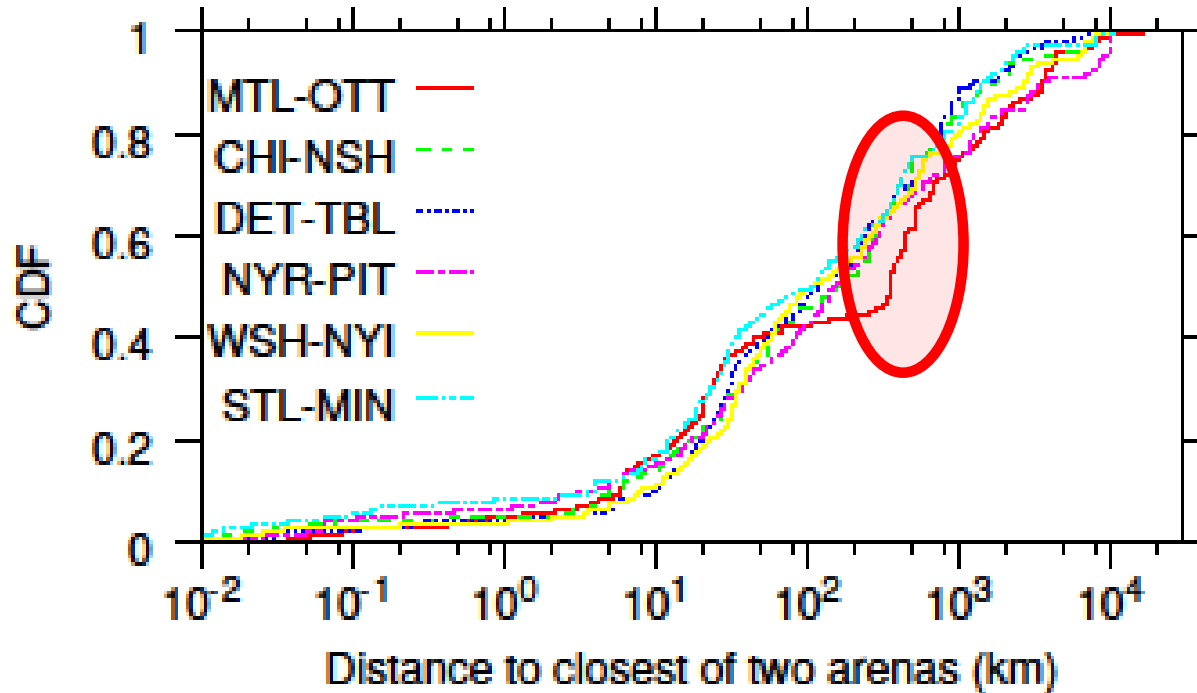
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 - E.g., 43-50% within 100km and 63% within 300km of arena of participating teams
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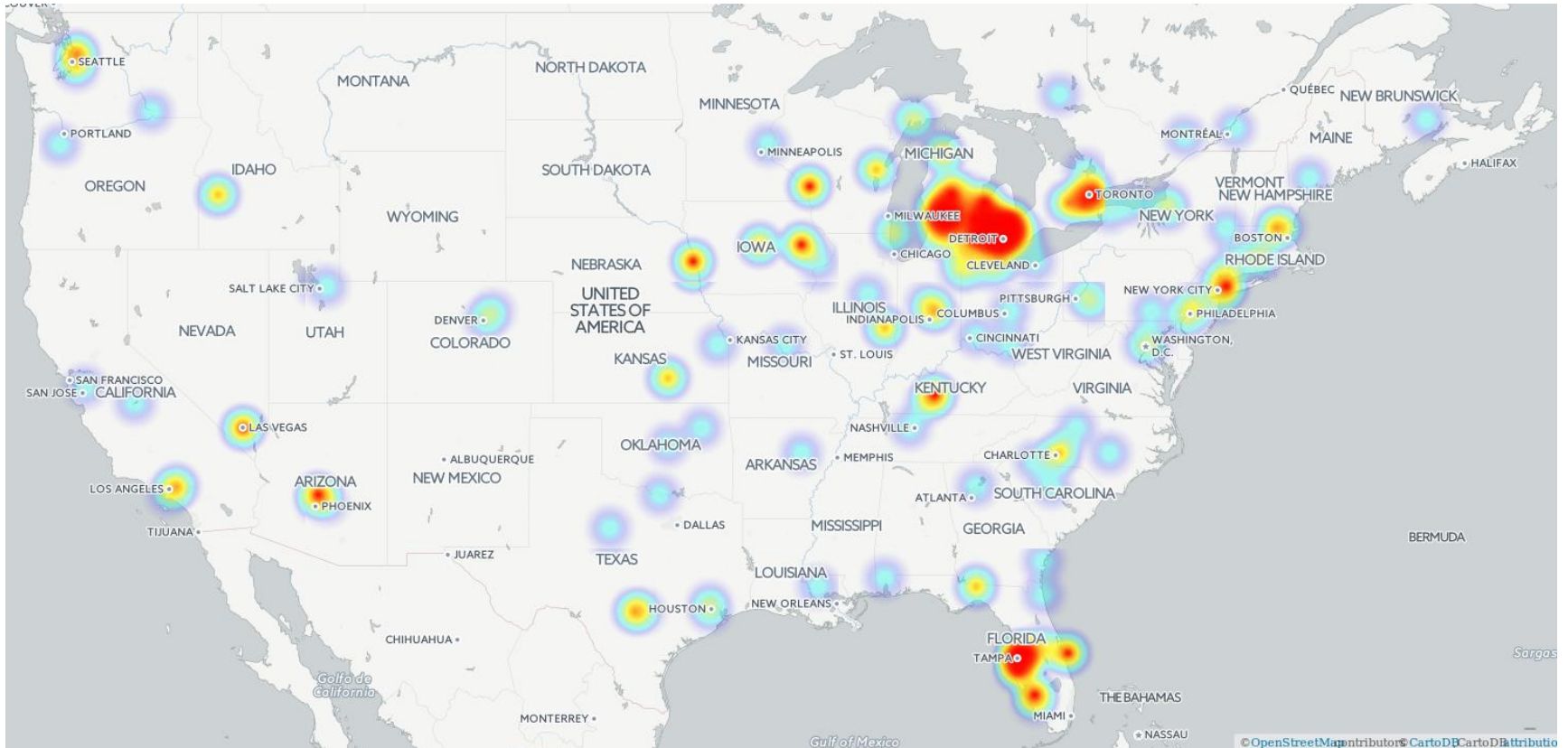
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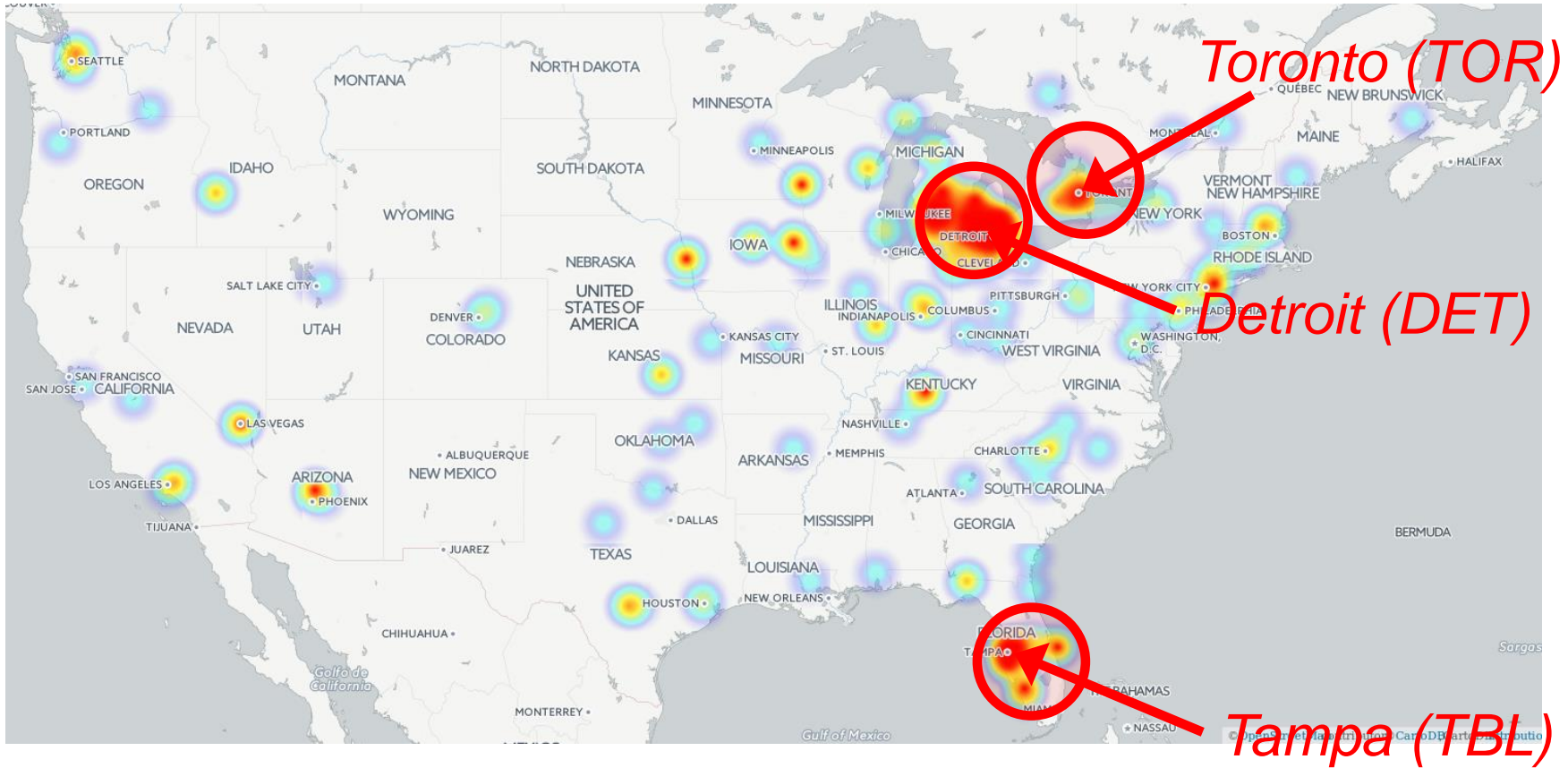
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Tweets during example game: DET vs TBL



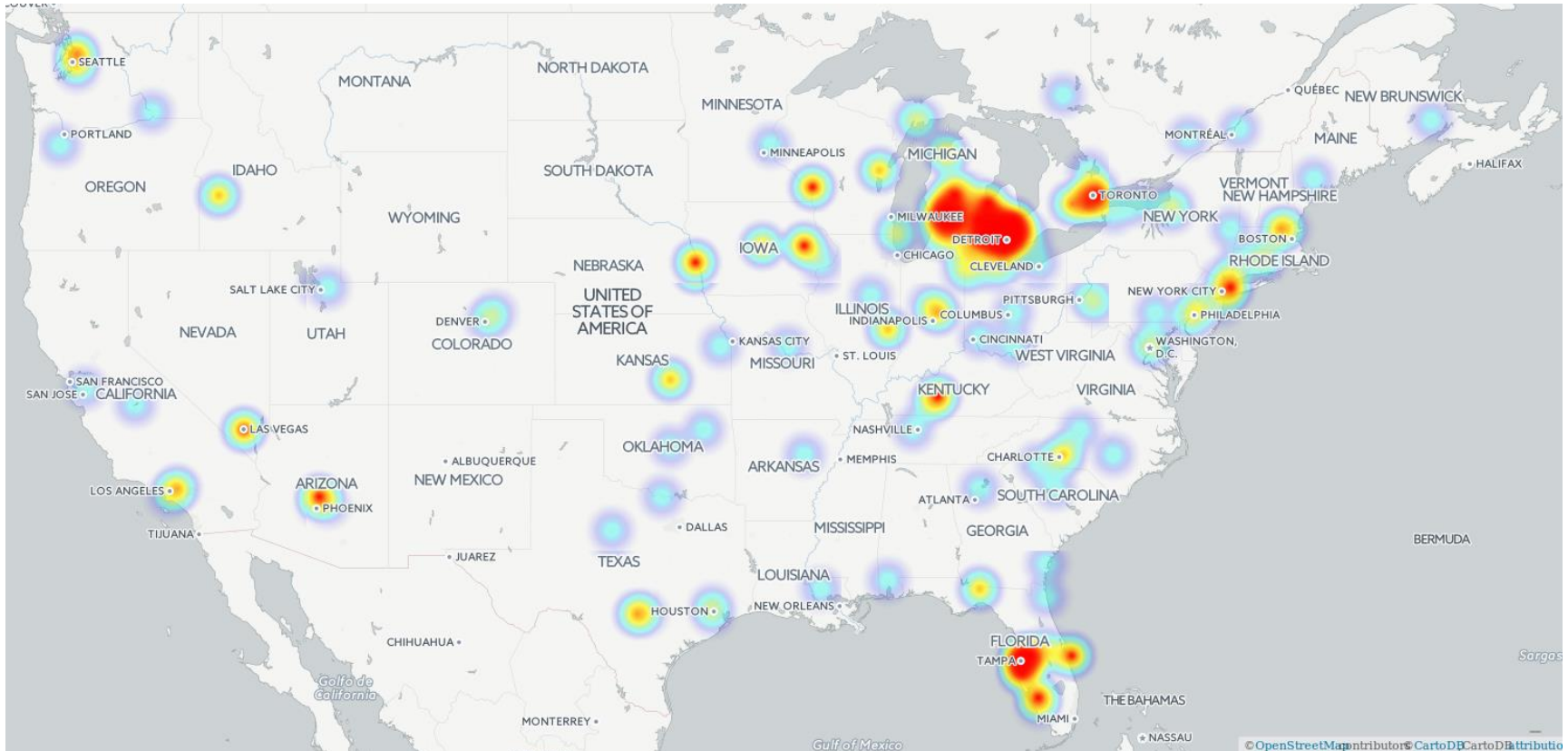
- Another example ...

Tweets during example game: DET vs TBL



- Another example ...

Tweets during example game: DET vs TBL



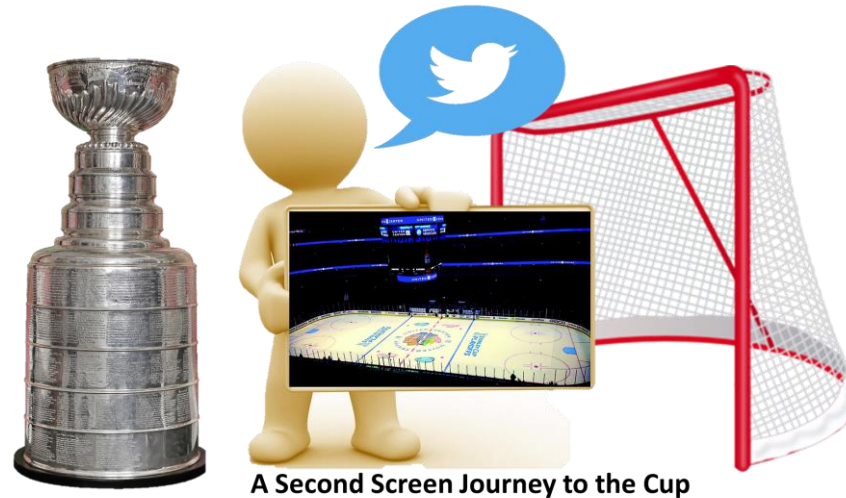
- Another example ...
- A closer look reveal huge imbalance in the location of tweets associated with the two teams: TBL in Florida region, and DET in rest

Conclusions

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- We present the first characterization of the second screen usage during individual games and across an entire playoff
 - Both temporal and spatial analysis of the Twitter usage during the end of the NHL regular season and the 2015 Stanley Cup playoffs
- Evidence that Twitter is used for real-time second screen usage
 - The majority of these tweets are done using mobile devices and more new content is generated during games (e.g., spikes at time of in-game events and lower retweet ratios)
- Tweeting actively is heavy tailed, roughly half of the tweets are retweets, and there are significant geographic biases
- Our geo-based analysis shows that the majority of tweets are from the regions closest to the competing cities, with a tail of tweeters further away, there is a high bias towards mentioning the local team, and user engagement drops significantly when local team eliminated

Thanks for listening!



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