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
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 ...

Sources: https://www.foxsports.com/southwest/gallery/the-all-time-best-trophies-in-sports-062114
https://en.wikipedia.org/wiki/Stanley_Cup
... true happiness during visit with the cup!
... a second attempt ...
The big guys journey to the Cup

Source: The independent
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
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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)
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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
- Most tweets not from arena itself
  - E.g., Less than 7.5% within 1km from arena
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Location: Fading interest after elimination

- Highest interest in championship city (CHI)
- 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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Tweet volumes during each round

- End of season proportional to number of teams in each category
- 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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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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Tweets per minute during in-game events

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

- Majority of activity close to participating cities
  - E.g., 43-50% within 100km and 63% within 300km of arena of participating teams
- Spike in MTL-OTT game due to Toronto
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Tweets during example game: DET vs TBL

- Another example ...
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• 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
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Thanks for listening!