

# Armchair Commentary Semantics

How do the outcomes of sporting events affect fanbase  
sentiments?

Aditi Rajagopal, Bradley Katcher, Charlie Putnam



A photograph of a massive crowd of spectators at a football game. The spectators are wearing red and white, suggesting they are fans of the home team. In the foreground, the backs of several players from the visiting team are visible, wearing white jerseys with yellow numbers and yellow pants. One player's jersey has the number 53. Another has 2. A third has 84. A fourth has 55. A fifth has 82. A sixth has 89. A seventh has 72. An eighth has 95. A ninth has 81. A tenth has 20. A eleventh has 86. A twelfth has 51. A thirteenth has 3. A fourteenth has 13. A fifteenth has 10. A sixteenth has 11. A seventeenth has 12. A eighteenth has 14. A nineteenth has 15. A twentieth has 16. A twenty-first has 17. A twenty-second has 18. A twenty-third has 19. A twenty-fourth has 20. A twenty-fifth has 21. A twenty-sixth has 22. A twenty-seventh has 23. A twenty-eighth has 24. A twenty-ninth has 25. A thirty-first has 26.

*The Game*









BECAUSE  
PURDUE  
IS A BIGGER  
RIVALRY



EVEN THE POPE  
THINKS N.D.  
IS OVERRATED  
THE HOME DEPOT

THE HOME DEPOT



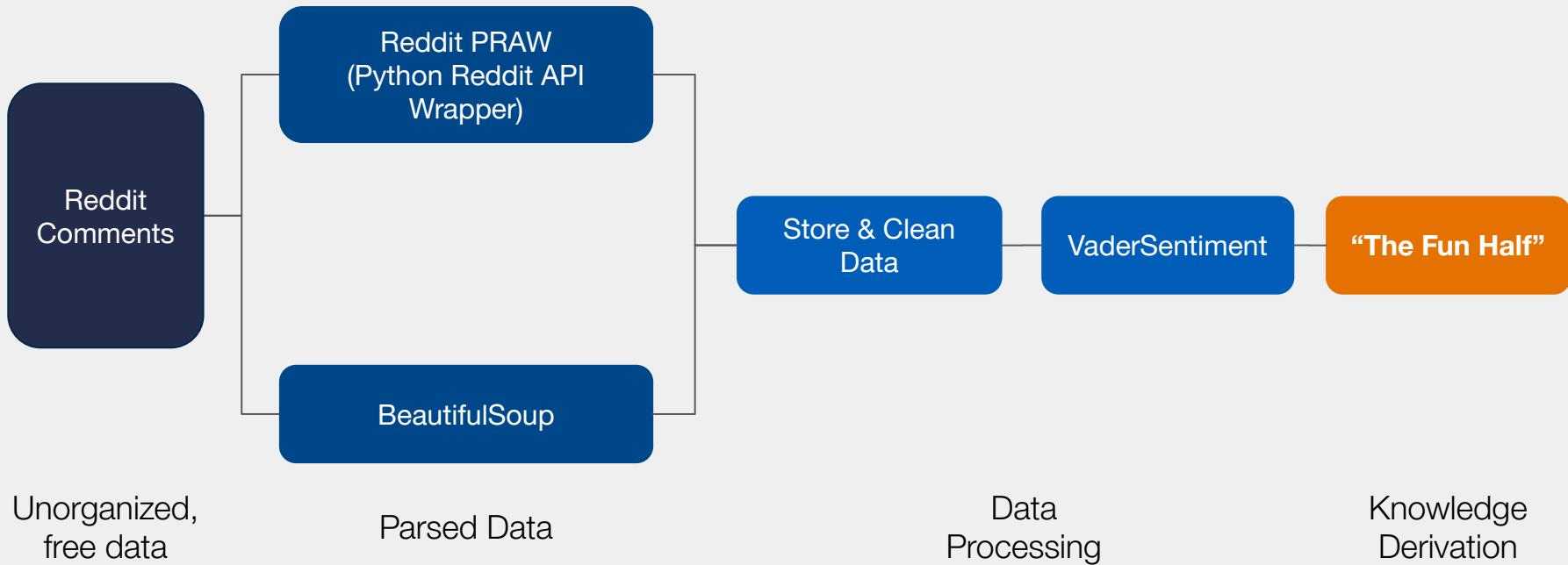
OLY WENT TO  
MICHIGAN

# Agenda

- Overview and Goals
- Methodology
- “The Fun Half”



# Methodology: Workflow





reddit

r/CFB

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2.2k

[Game Thread] Michigan @ Ohio State (12:00PM ET) Game Thread



Posted by /r/CFB u/CFB\_Referee 8 months ago

2.2k

## [Game Thread] Michigan @ Ohio State (12:00PM ET)

Game Thread

GAME	<a href="#">Michigan</a> <a href="#">Michigan @ Ohio State</a> <a href="#">Ohio State</a>
Location	<a href="#">Ohio State</a> Ohio Stadium
Time	12:00PM ET
Watch	<a href="#">TV: FOX</a>
Odds	<a href="#">Spread: Michigan -4.5 - Over/Under: 56</a>
	<a href="#">Flair</a>   <a href="#">Merch</a>   <a href="#">Chat</a>
	Made with the <a href="#">/r/CFB Game Thread Generator</a>

Please keep trash talk civil, and report any comments that violate [our rules](#).

LET'S TALK FOOTBALL!

21.8k Comments



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95% Upvoted



This thread has been locked by the moderators of r/CFB

New comments cannot be posted

SORT BY [NEW \(SUGGESTED\)](#) ▾

Houston • Waterloo SometimesY Score hidden · 8 months ago · Sticked comment



Since this thread has reached 20k+ comments, it has been locked. The second half



r/CFB

587k

Fans

2.1k

Tailgating

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Primarily focused on NCAA football,  
discussion is welcome on any collegiate  
league, teams, and players.

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# Methodology: What makes a Reddit Comment?



# Methodology: Data Overview

				Sorted timestamps		Categorized Fan base		VADER Sentiment Scores			
	author	flair	comment	timeStamp	textblobScore	votes	flair_clean	neg	neu	pos	compound
157	meatfrappe	:harvard: :medal: Harvard • /r/CFB Top Scorer	**FUN FACT**: There are three versions of "The Game"; this one, which is 121 years	2018-11-24 11:00:31	[0.0399999999999999]	114	neither	0.0	1.0	0.0	0.0
8	KushDingies	:northwestern: Northwestern	I'm flattered these two teams are fighting for the chance to lose to us next week	2018-11-24 11:01:00	[0.0]	620	neither	0.239	0.55	0.211	-0.1531
382	sergeantturnip	:michigan: :westernmichigan: Michigan • Western Michigan	ive never been so nervous for a game lol	2018-11-24 11:06:30	[0.2]	12	michigan	0.238	0.52	0.243	0.0152
18	Hoffelcopter	:michigan: :easternmichigan: Michigan • Eastern Michigan	I predict a nice, non toxic game thread. No one complains about reffing. Everyone ei	2018-11-24 11:07:22	[0.0999999999999999]	280	michigan	0.121	0.653	0.226	0.6369
85	MichBolts	:michigan: Michigan	This just shouldn't be allowed	2018-11-24 11:11:00	[-0.5]	165	michigan	0.313	0.687	0.0	-0.6249
			Big Nut is the worst.								
142	jfkblue	:michigan: :toledo: Michigan • Toledo	My anxiety is high	2018-11-24 11:12:30	[0.16]	19	michigan	0.362	0.638	0.0	-0.1779
229	aquaholic3	:notredame: :airforce: Notre Dame • Air Force	I had a nightmare that I was stuck in one of those escape rooms and I was going to	2018-11-24 11:13:37	[-0.4, -0.4, 0.0,	39	neither	0.08	0.854	0.066	0.0147
95	minusidea	:ohiostate: Ohio State	I have a feeling this game is going to be absolutely fucking ridiculous... And I'm not	2018-11-24 11:15:47	[-0.1433333333333333]	51	ohiostate	0.155	0.715	0.13	-0.1913
1	breadwolfbaby	:michiganstate: Michigan State	This will be a great appetizer for MSU-Rutgers later hahaha amirite guys	2018-11-24 11:16:19	[0.3333333333333333]	825	neither	0.0	0.539	0.461	0.8271
5	Bluemzv12	:michigan: Michigan	Bold prediction:	2018-11-24 11:20:34	[0.4166666666666666]	353	michigan	0.0	0.755	0.245	0.3818
			There are gonna be SOOOOO many commercials.								
383	oohbopbadoo	:michigan: :nebraska: Michigan • Nebraska	Michigan by 50	2018-11-24 11:21:35	[0.0]	13	michigan	0.0	1.0	0.0	0.0
3	Sctvman	:collegecharleston: :southcarolina: Charleston (SC) • South...	There are people online complaining this is a Noon start. Well, it is a tradition...	2018-11-24 11:22:09	[0.0, 0.0]	371	neither	0.121	0.738	0.141	0.0772
269	ZeldaFanBoi1988	:michigan: Michigan	I couldn't sleep at all. I'm nervous. I'm scared.	2018-11-24 11:30:19	[0.0, 0.0, 0.0, 0,	15	michigan	0.37	0.508	0.122	-0.8058
			I have a pain in my side. I might have an ulcer.								
			Just fucking win you assholes								
384	scarletarrows	:ohiostate: Ohio State	I asked my mom for a mimosa and she said "well I feel like you actually need a Xanax"	2018-11-24 11:34:30	[0.0999999999999999]	13	ohiostate	0.155	0.601	0.244	0.5574
			I feel good about this game. Michigan, I respect the hell out of you and the revenge								
			Let's. Go. Bucks.								
40	raraicky	:wisconsin: :texas: Wisconsin • Texas	Drinking game: Anytime they show Harbaugh or Meyer, anytime the mention Michig	2018-11-24 11:36:21	[-0.305]	37	neither	0.22	0.657	0.123	-0.6808
			Result: dead								
100	SpooFwagon	:mountunion: :michigan: Mount Union • Michigan	This has been the longest pregame of my life	2018-11-24 11:37:23	[0.0]	23	michigan	0.0	1.0	0.0	0.0

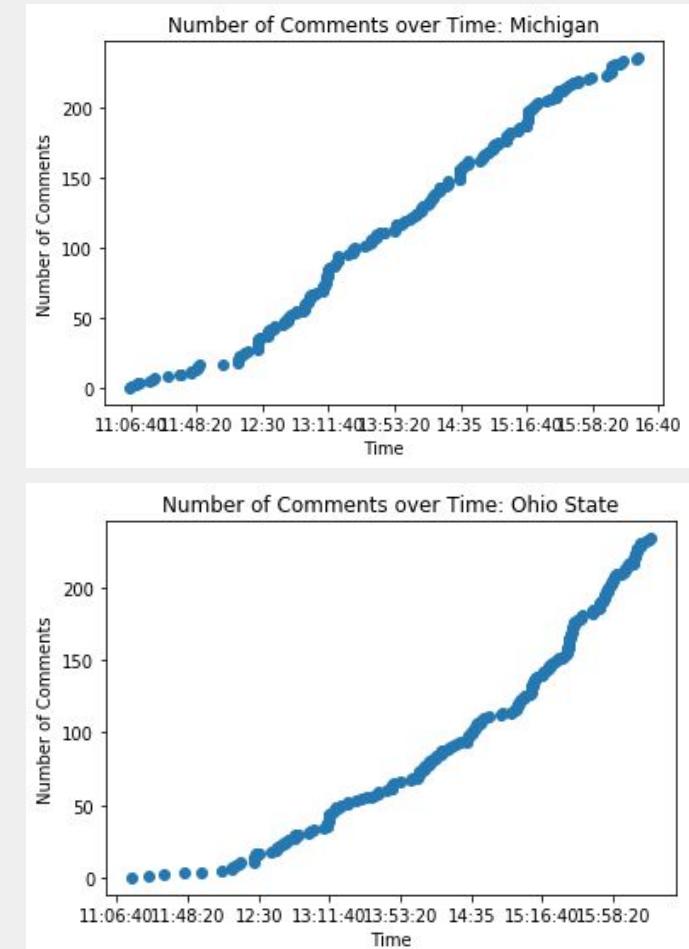
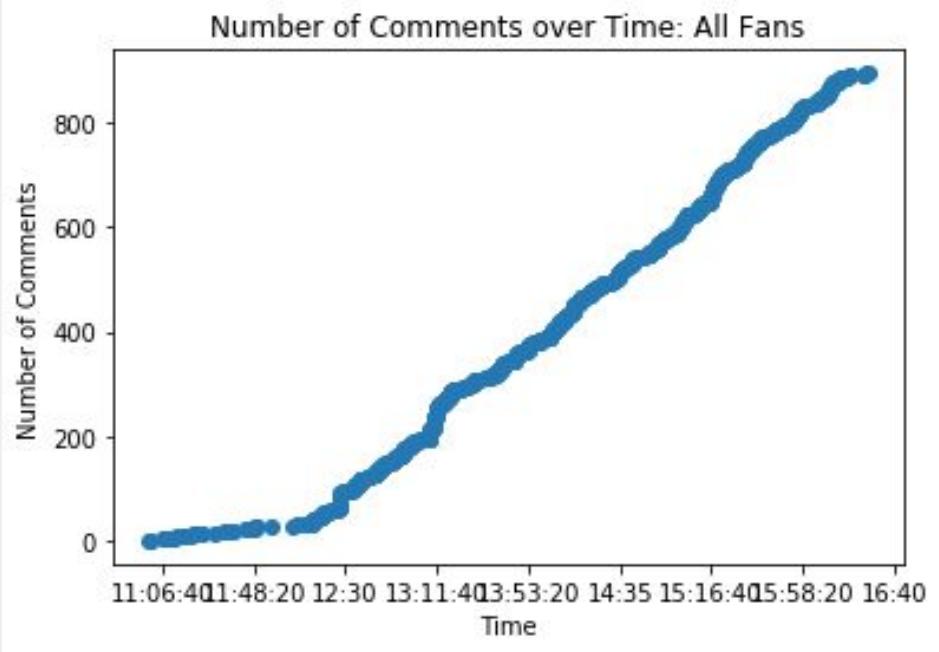
# What is VADER Sentiment Analysis?

“VADER Sentiment Analysis. VADER (Valence Aware Dictionary and sEntiment Reasoner) is a lexicon and rule-based sentiment analysis tool that is specifically attuned to sentiments expressed in social media, and works well on texts from other domains.”

- **Open-sourced** under the MIT License
- Takes into consideration punctuation, word-shape, degree modifiers, slang/acronyms, emoticons, emojis etc
- **Easy to use** (no training needed), **Easy to comprehend scoring mechanism** (positive, negative, neutral and compound scores)

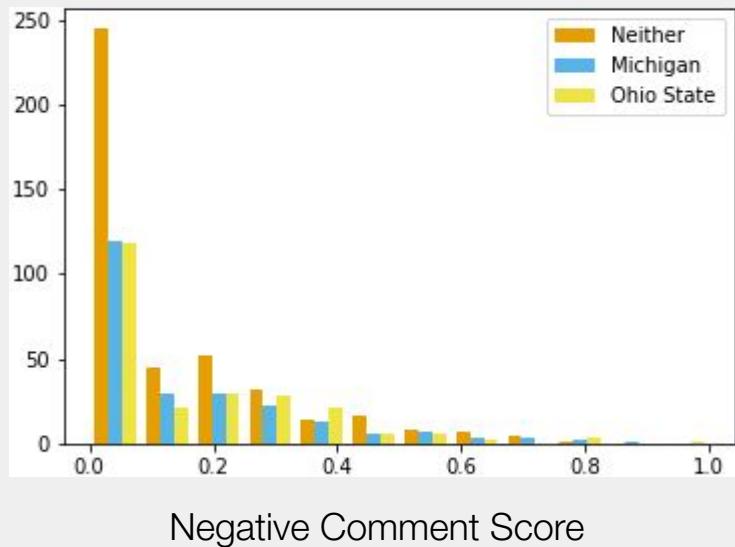
# Methodology: Comment Examples

# Exploring Comment Rates

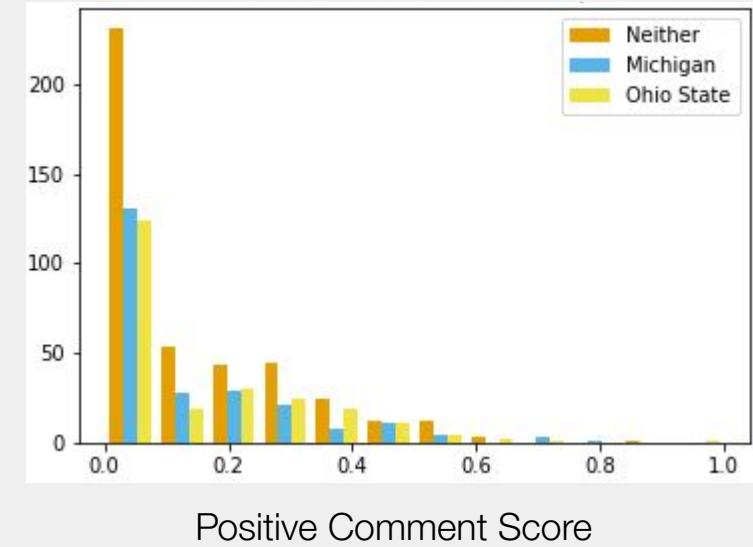


# Distribution of Comments By Fanbase

Number of Comments

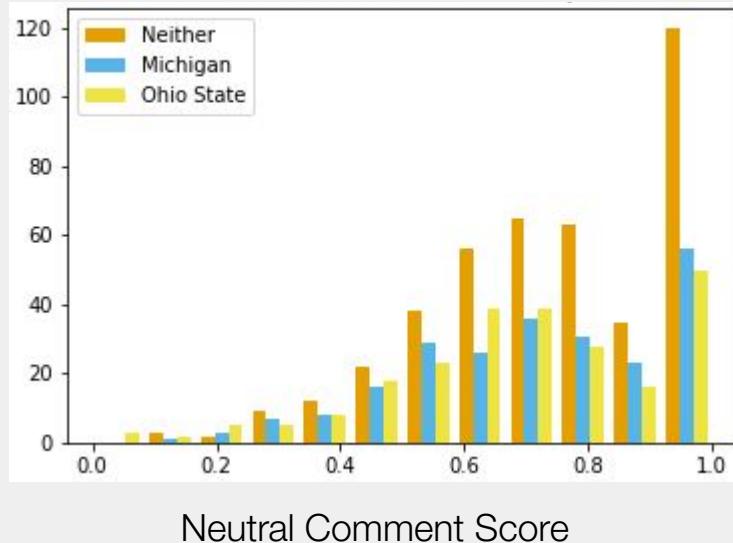


Number of Comments

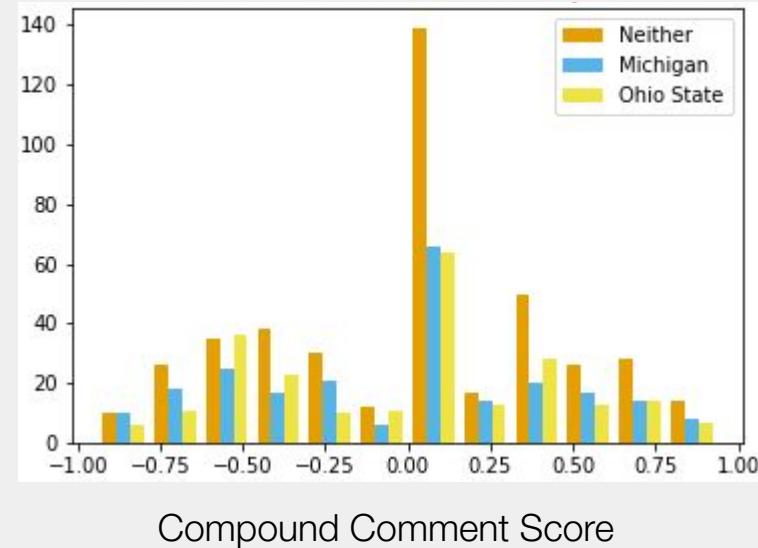


# Distribution of Comments By Fanbase (continued)

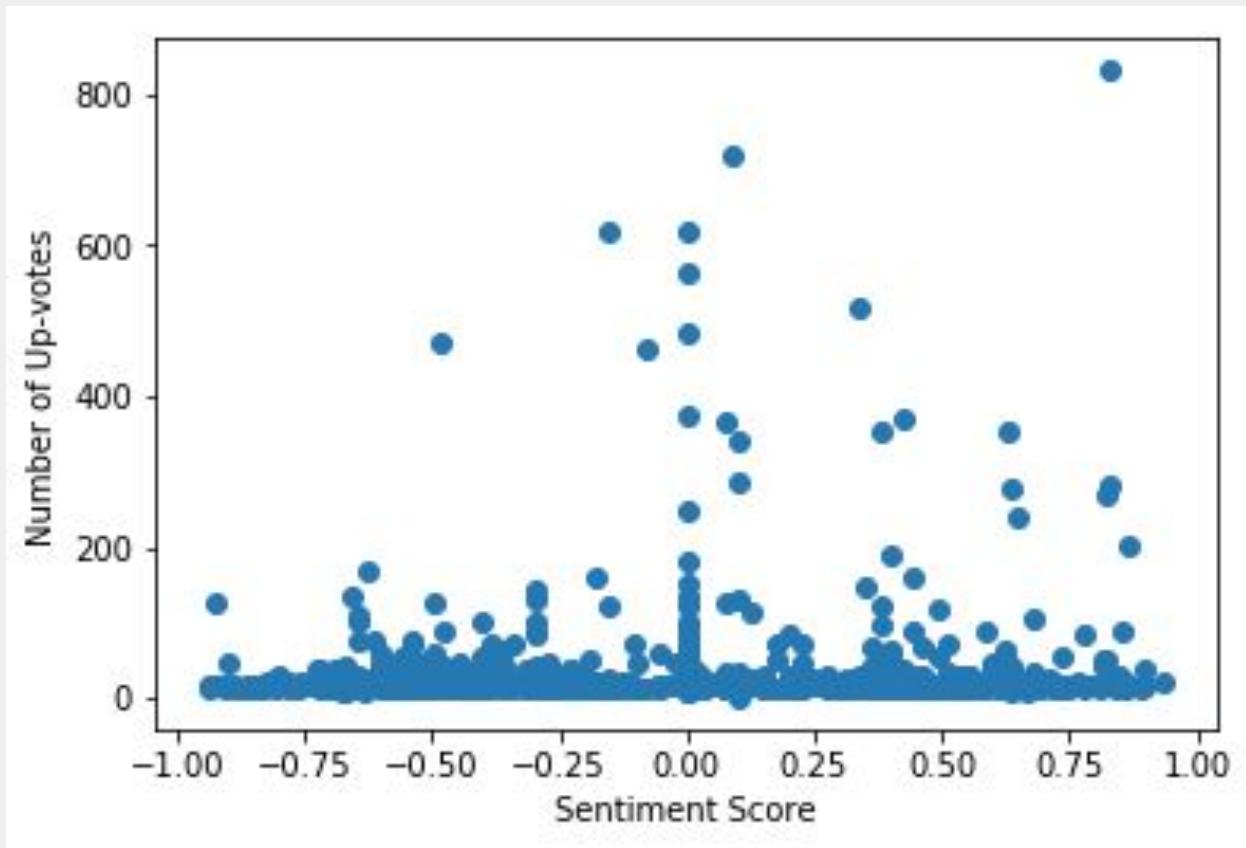
Number of Comments



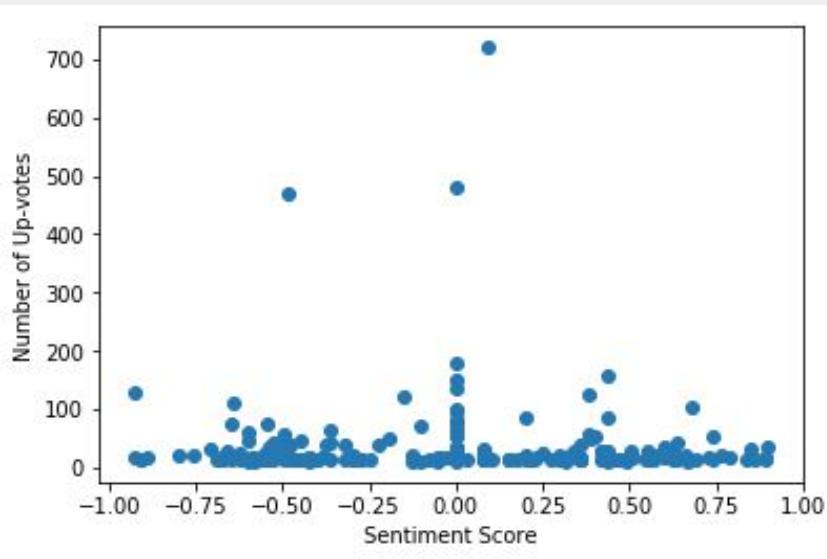
Number of Comments



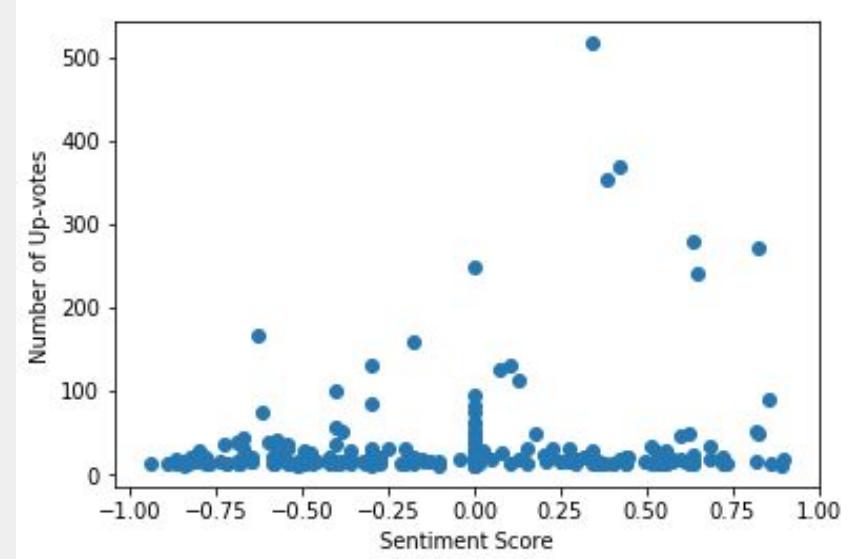
# Correlation between Sentiment and Up-Votes



# OSU

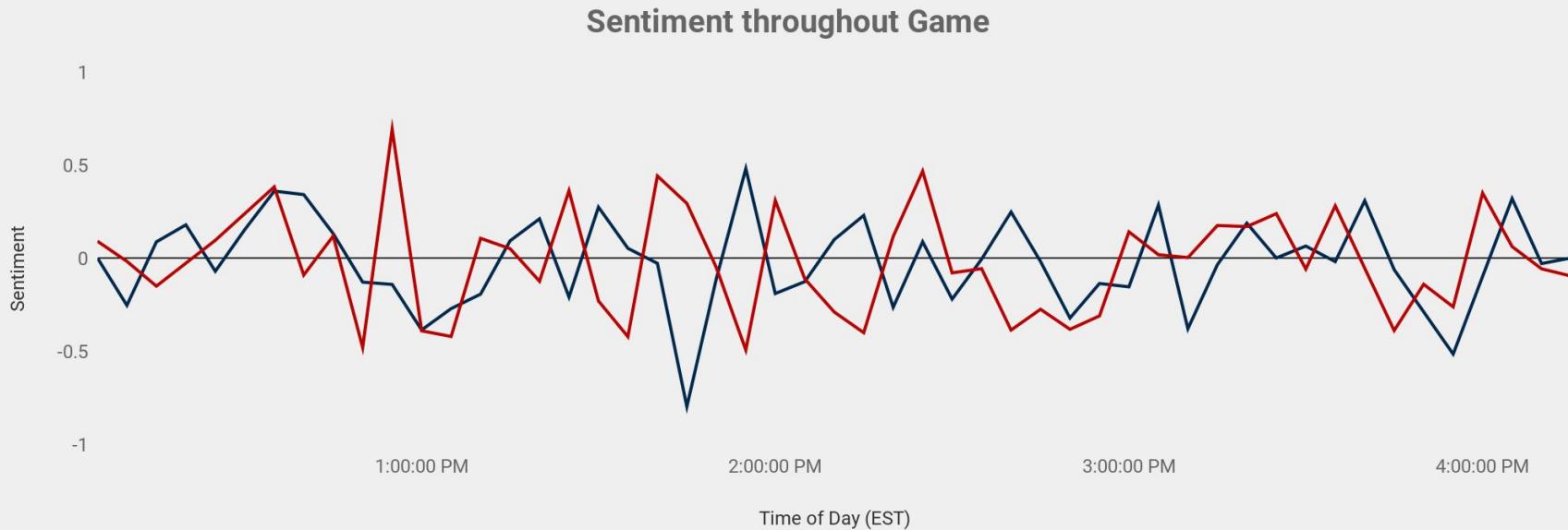


# Michigan



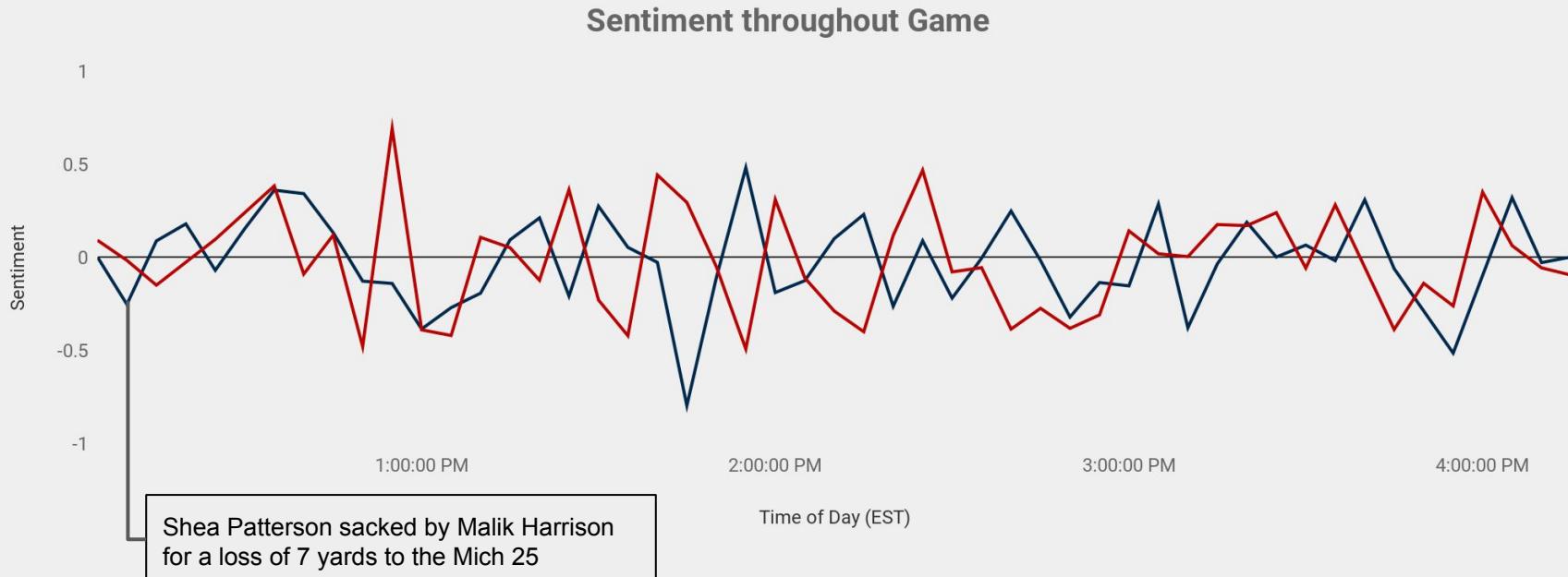
# Sentiment over Time

Michigan | Ohio State



# Sentiment over Time

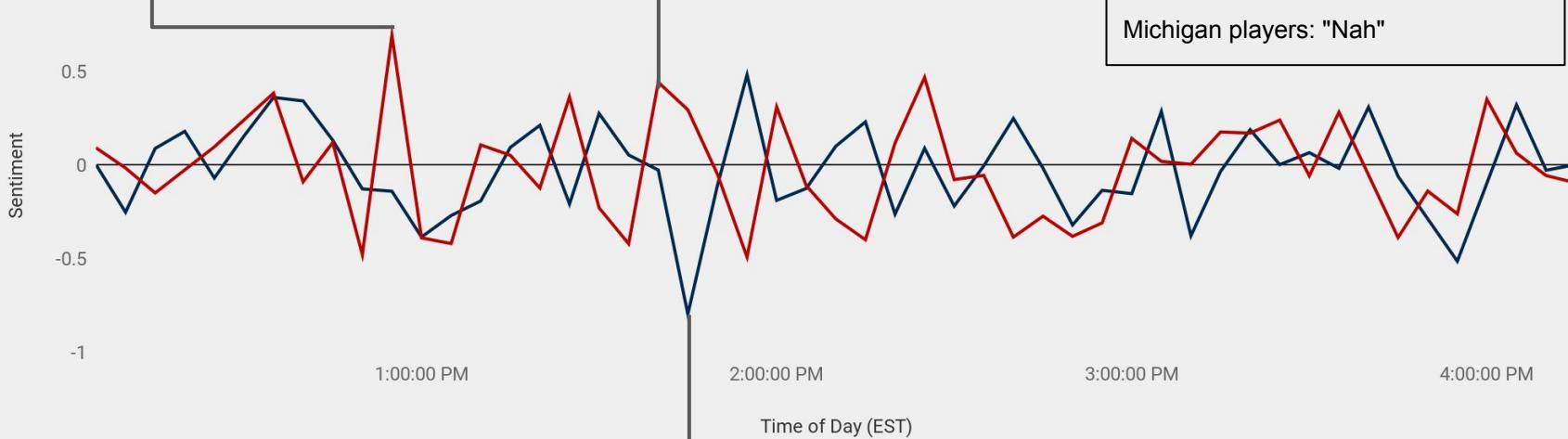
Michigan | Ohio State



# Sentiment over Time

## Michigan | Ohio State

Pretty thoroughly impressed by the discipline of both teams so far all told. Glad to see it's been just football.



Michigan fans: "We have huge momentum, and they have to drive over 80 yards. Let's play defense for 40 seconds and win in the 2nd half"

Michigan players: "Nah"

"I yelled so loud I woke my daughter up from her nap. My wife is pissed. I don't care."





imaginable joke playing route route returns life失望 Johnson失望 pregame  
ju now gonna Rodriguez anyways life sleep失望 paint Keith  
watching answer going weeks got logo bl mean TITLED  
high moody damn Absolute becoming hurts li  
high dad year dad ready ran Harbaugh Keeping wa  
whole sh\*tty wish Well loss don Butt  
non embra what BOARD Uh related twice lead  
need ba even what BOARD Uh related twice lead  
f\*ck toxic John bo fan Gus change  
hyped predict Fucking prediction eno rivalr come calling  
Nut sound call Hard agree Sad  
tradition inThere prediction crossing fan pregnant WHERE'S  
Defense call Hard agree Sad  
SC smart football wife lol tuned facemask  
Rich said everyone field think sh\*t Dantonio go broadcast back  
injury guy start lookin officially go Beilein  
field think guy start lookin officially go broadcast back  
blowout go MVP last  
Bold happened expected around time anything re hoping  
happened injury guy start lookin officially go broadcast back  
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UNIVERSITY OF VIRGINIA  
DATA SCIENCE  
INSTITUTE

# Testing

- Incremental Testing
  - Test methods separately before putting them together
    - Connecting to PRAW
    - Receiving initial data
    - Cleaning data
    - Organizing Data
- End-to-End testing
  - Verify that graphs are generated
  - Verify that data is scraped, stored in pandas, exported into csv, transformed into visualizations



# Applications and reusability

- Web scraper can be used for any reddit post
  - Content Moderation
    - Flagging key words
    - Abusive users
    - Active users
  - Community Activity monitoring and analysis
    - Content generation (what gains traction)
- Sports-related specifics
  - Gambling
  - “Snapshot in time”/Nostalgia
  - Sentiment feedback on broadcasting



# Areas for Improvement & Next Steps

- Expand the dataset (get all threads), and improve PRAW performance

Nested  
Comments/  
Threads

↑ Charleston (SC) • South... Sctvman 369 points · 8 months ago  
↓ There are people online complaining this is a Noon start. Well, it is a tradition...

↑ Michigan • Transfer Portal andysaurus\_rex 257 points · 8 months ago  
↓ If you don't like The Game at noon, you don't like The Game.

**Continue this thread →**

↑ Penn State • California tutorialpegasus 125 points · 8 months ago  
↓ You can't reason with the uncultured

↑ Eastern Michigan • Michigan justtheeveryworst 48 points · 8 months ago  
↓ There are people who get it, and those who just don't.

**7 more replies**



# Areas for Improvement & Next Steps

- Map ESPN Win Probability and Play-By-Play data to Reddit Comments

The screenshot shows the ESPN.com homepage with a football game summary for Michigan vs. Ohio State.

**Top Events:**

Event	Time	Team 1	Team 2	Score
MLB	6:40 PM ET	COL	ATL	48-55
	7:05 PM ET	LAD	TB	67-37
	7:05 PM ET	CIN	PHI	55-47
	7:05 PM ET	WSH	TOR	54-48
	7:05 PM ET	MLBN	NYY	58-47
	7:05 PM ET	MLBN	BOS	66-36
	7:10 PM ET	PIT	NYM	57-47
	7:10 PM ET	ARI	NYM	46-56
	7:10 PM ET	CHC	MIA	52-51
	8:10 PM ET	MIN	MIL	55-47
	8:10 PM ET	CHW		54-50

**Game Summary:** Michigan Wolverines vs. Ohio State Buckeyes

Final					
	1	2	3	4	T
MICH	3	16	0	20	<b>39</b>
OSU	7	17	17	21	<b>62</b>

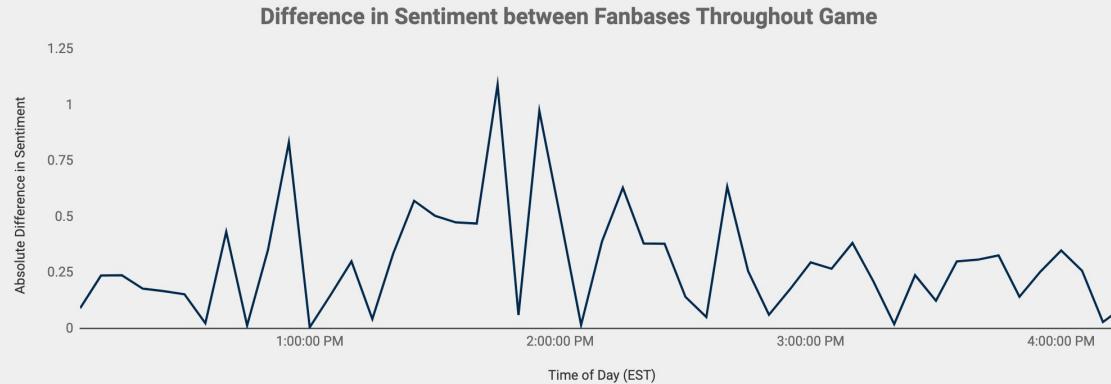
**Play-by-Play:**

- (15:00 - 1st) Blake Haubeil kickoff for 56 yds , Ambry Thomas return for 15 yds to the Mich 24
- 1st & 10 at MICH 24
- (14:55 - 1st) Karan Higdon run for 8 yds to the Mich 32
- 2nd & 2 at MICH 32
- (13:56 - 1st) Shea Patterson sacked by Malik Harrison for a loss of 7 yards to the Mich 25
- 3rd & 9 at MICH 25

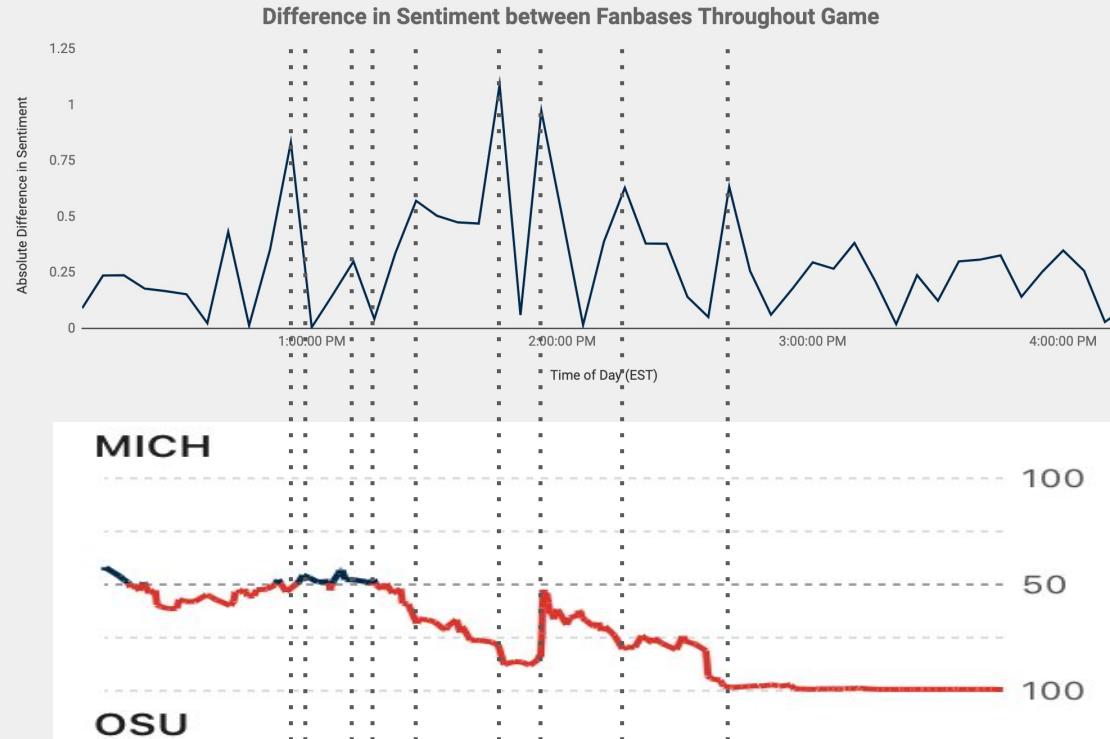
**MICH @ OSU Videos:**

Haskins' 5 TDs power Ohio State's 62-39 rout over Michigan

# Difference in Compound Sentiment Score



# Difference in Compound Sentiment Score



# Questions?

