Twitch Channel Recommender

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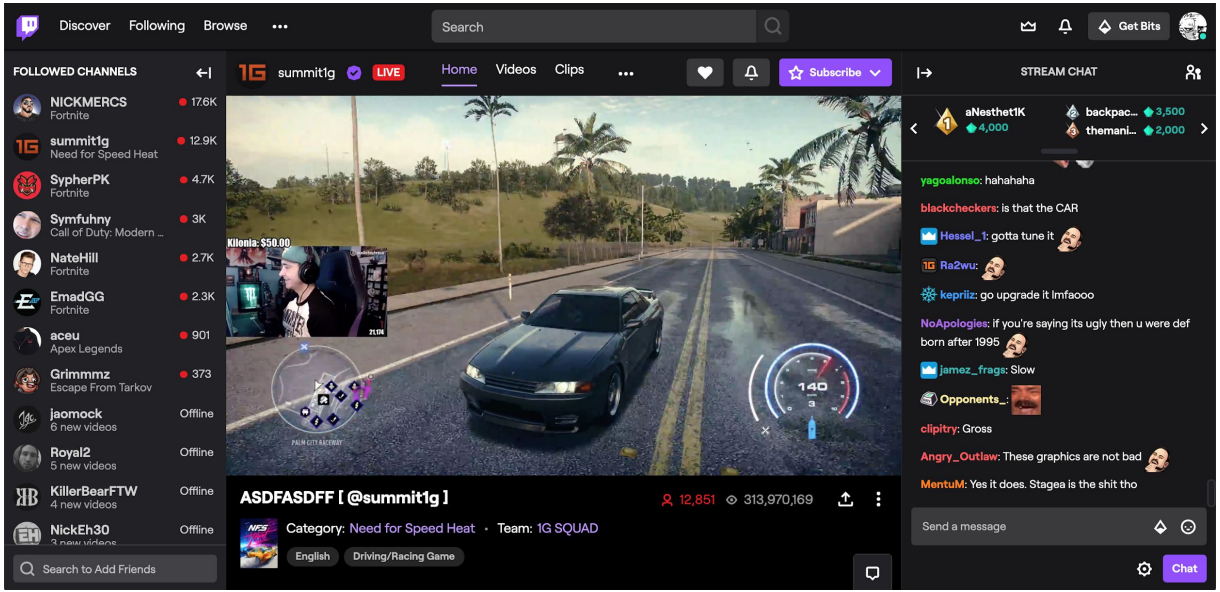
What is Twitch?

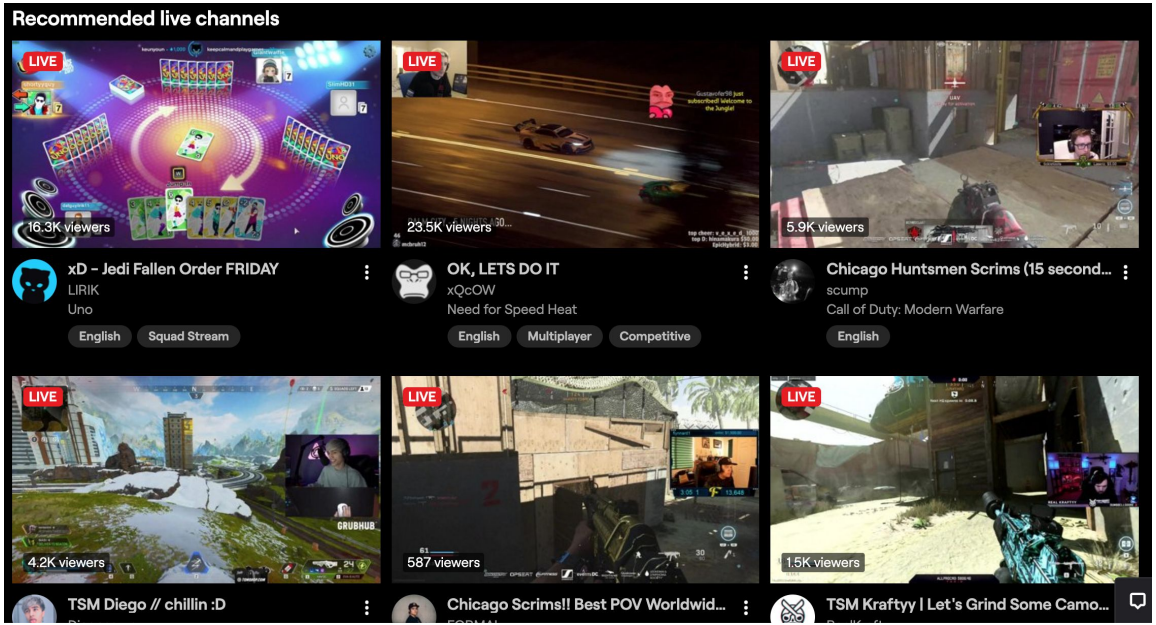
- Streaming site primarily for gaming
- Interact with streamer and other viewers via chat



Motivation

CURRENT RECOMMENDATION SYSTEMS FLAWS

- Recommendations based on what that the user currently watches / follows
- No user input or real-time analysis of chat
- Chat generally portrays the mood of the stream



Design

DESIGN OVERVIEW

Which Game Do You Want To Watch?

ANY GAME!	DOTA 2	FIFA 20	DEAD BY DAYLIGHT	RED DEAD REDEMPTION 2
SLOTS	WORLD OF WARCRAFT	CALL OF DUTY: MODERN WARFARE	PLAYERUNKNOWN'S BATTLEGROUNDS	10 MILES TO SAFETY
GRAND THEFT AUTO V	LEAGUE OF LEGENDS	SEA OF THIEVES	FORTNITE	HEARTHSTONE
FINAL FANTASY XIV ONLINE	MINECRAFT	APEX LEGENDS	OVERWATCH	NEED FOR SPEED HEAT
DEATH STRANDING	TOM CLANCY'S RAINBOW SIX: SIEGE	JUST CHATTING	COUNTER-STRIKE: GLOBAL OFFENSIVE	ESCAPE FROM TARKOV

Select Desired Mood Of Stream

ANGER | DISGUST | FEAR | JOY | SADNESS | SURPRISE

GET RECOMMENDATION!

RECOMMENDATION

We recommend xqcow!
Channel link: https://www.twitch.tv/xqcow

Emotion	Messages
Anger	1
Disgust	0
Fear	0
Joy	**8**
Sadness	1
Surprise	2

Number of messages for each respective emotion

GET NEW RECOMMENDATION!

Live Game & Message Collection

- Uses Twitch API endpoint to display currently most viewed games
- More viewers = more chatters = faster & better recommendation
- Uses Twitch IRC Chat API and multithreading to efficiently collect live chat messages

Message Analysis

- Traditional mood analyzers are designed for regular text
- Emotes are the almost always the most significant indicator of mood of Twitch chat
- Need to figure out a way to associate emotes with emotions

Top 10 Emotes Today

Time and date is tracked based on UTC. Updates at 15 minute intervals.

Rank	Emote	Uses
1		69,940
2		46,780
3		19,887
4		17,491
5		15,632
6		15,102
7		11,919
8		11,755
9		10,602
10		10,016

EMOTE-WORD PAIRS TO EMOTION

- Get messages with both emote and text
  - “LUL that was awesome”
- Pass message without emotes to a mood analyzer to get emotion
  - “that was awesome” -> Joy
- Clean message without emotes (remove punctuation, stopwords, etc.) and associate emote-word pair with emotion
  - (LUL, awesome) -> Joy

- Emote-words may map to different emotions, so we take the most common one
  - “LUL that was awesome!” | (LUL, awesome) -> Joy
  - “LUL that was not awesome, you suck!” | (LUL, awesome) -> Angry

- Mapping for an individual emote may look like this
  - (LUL, awesome) -> Joy
  - (LUL, great) -> Joy
  - (LUL, happy) -> Joy
  - (LUL, suck) -> Angry

- Default mapping with no word mapped to most common emotion
  - (LUL, None) -> Joy

- Trained machine learning model on emote-word pairs to emotion mappings
- ML models need vectors with numbers, can’t operate directly on text
- Trained Word2Vec model to map words and emotes to numerical vectors
- Word2Vec maps words that are similar in meaning to be closer together in vector space
  - great -> [1.1, 1, 1]
  - good -> [1.2, 1, 1]
  - bad -> [-3, -5, -10]

USING TFIDF TO ANALYZE INDIVIDUAL MESSAGE

- “OhMyDog that dog came in unexpectedly”
- How can we pick the most meaningful word in a message to pass into our model?
  - Trained Tfidf (term frequency–inverse document frequency) model to get relative frequencies of words
- Less common words = more significant to meaning of sentence
  - dog -> high frequency
  - came -> high frequency
  - unexpected -> medium frequency
- Result: (OhMyDog, unexpected) -> Surprise

- Added a few manual overrides to improve accuracy
- Given a stream of messages, all messages with just emotes or both emotes and text are analyzed through the ML model
- Messages with only text are not analyzed
  - Mood analyzer is slow
  - Messages without emotes generally are not as indicative to the mood of the stream

Demo

Questions?