

# **Tweet, Reaction, Action**

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# Outline

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Introduction

Methods

Logistics

# Introduction

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## Incitement: a timeline of Trump's inflammatory rhetoric before the Capitol riot

Tech

The president, his family and his allies made disturbing remarks in the run-up to Wednesday's

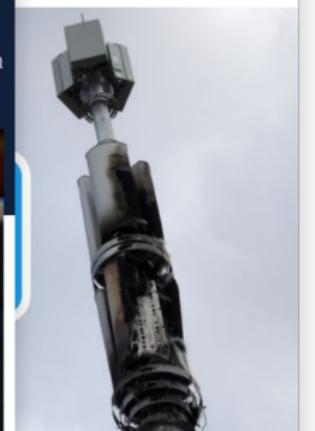
## Coronavirus: Twitter bans incitement to attack 5G towers

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TECH & MEDIA

## Far-right group takes victory lap on social media after violence in Manhattan

"I have a lot of support in the NYPD, and I very much appreciate that, the boys in blue," said Gavin McInnes, the founder of "Western Chauvanist" group Proud Boys.



## Countermeasures — Status Quo

- Newsrooms
- Large volume of tweets
- Manual labour by experts
- Time-intensive

# Preliminary Goals

- Investigating AI based preselection
- Starting point: apply *NLP* and *sentiment analysis*

## Why is this hard?

- Short, informal messages
- Sentiment  $\neq$  intent
- Context matters

# Context Matters



**Bob**@b0b · 2h

Anybody up for an end of summer BBQ?  
My treat!

# Context Matters



**Alice**@apliddell · 2h  
Govt putting up another #5G #corona  
mast in town.



**Bob**@b0b · 2h  
Replying to [@apliddell](#)  
Anybody up for an end of summer BBQ?  
My treat!



**Alice**@apliddell · 2h  
Replying to [@b0b](#)  
I'll meet you there, will bring the petrol!

# Goals

- Investigating AI based preselection
- Starting point: apply *NLP* and *sentiment analysis*
- Informed by *pragmatics* and *discourse analysis* for considering discussion structure
- Ethical Recommendations

## Methods

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# Overview

- Using *BERT* to get initial *intent-embeddings* for tweets
  - Training on sentiment / intent
- Tracking initial embeddings in *conversational trees*
- Analysis of flow of intent in conversational trees
- Learning to predict in advance where to look

# BERT

- Google AI
- Bidirectional Encoder Representation from Transformers
- Dual to GPT
- Transfer Learning
  - Pre-trained
  - Fine-tuning



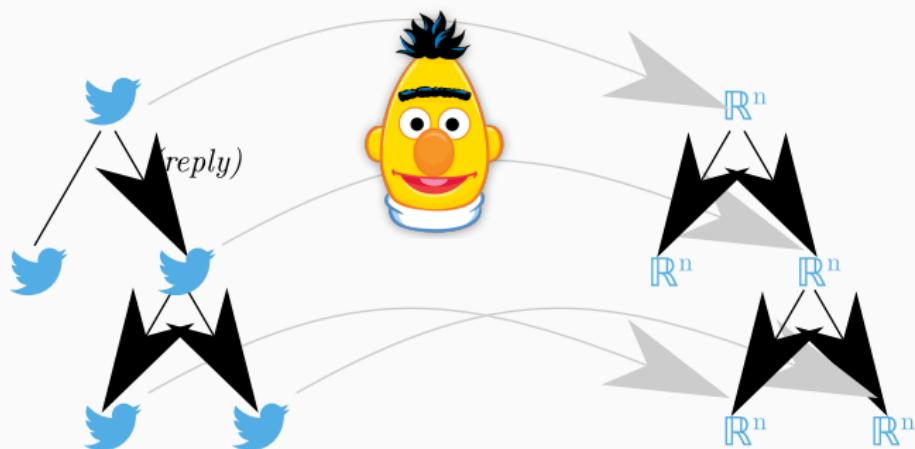
# Conversation Trees

- Tweets can have “reply to” relation
- Structure extractable<sup>†</sup> via Twitter API
- Possible to construct conversation trees

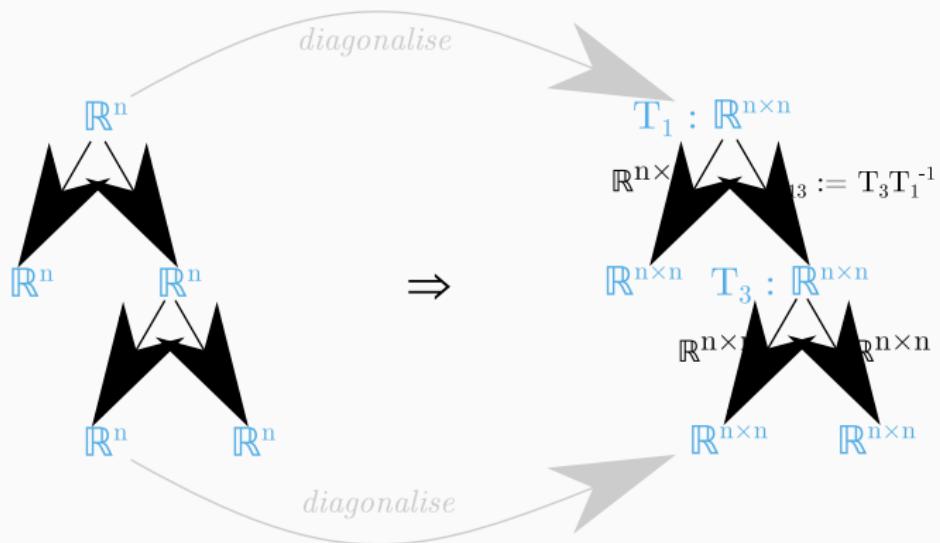
# Sheafification

- Interpretation as Presheaves / Sheaves
- Method for associating data to topological structure
- Structure provided by conversation trees  
(simplified graph topology)
- Data in the form of vectors and linear transformations

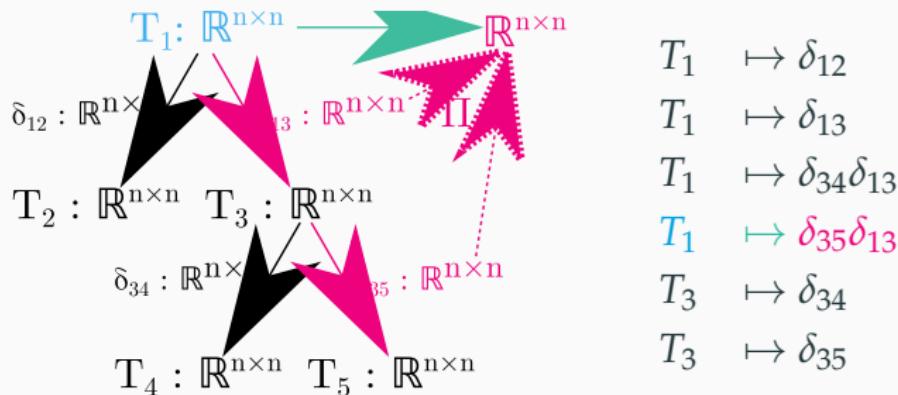
# Initial intent labeling



## Forward Search — Vertex to edge



## Backward Consolidation — Connected edges to subtree flow



Learn **relations** between each **origin tweet** and **paths**

# Logistics

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# Timeframe

- Project proposal phase ending
- Research phase starting
- Projected end — February

# Challenges

- Twitter data extraction
  - Up is easy, down is hard
- Finding or making labeled training data
- Fine-tuning BERT
  - Computationally expensive

**Questions?**