CRISISFacts: Summarizing Technologies For Emerging Crisis Events

Pranav Patil, Dheeraj Orguganty, Will Corbin

Two Dead in Explosion at Houston Plant

A blast woke Houston residents from sleep in the early hours of Friday morning, shattering windows and scattering debris. The two fatalities were believed to be employees of the plant, officials said.

KHOU 11 News Houston
@KHOU

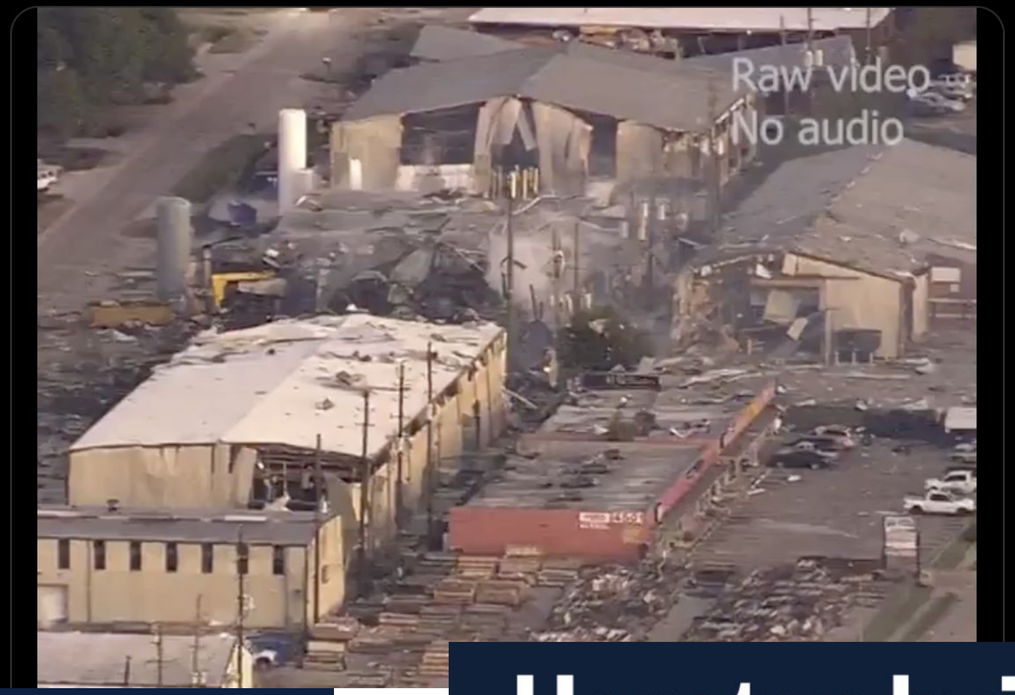
Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explosion in northwest Houston. 1 resident taken to the hospital, 1 worker missing, HFD says. MORE: khou.com/article/news/l... #HTownRush #KHOU

xplosion at Houston

dents from sleep in the early hours of
g windows and scattering debris. The
d to be employees of the plant, officials

KHOU 11 News Houston
@KHOU

Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explosion in northwest Houston. 1 resident taken to the hospital, 1 worker missing, HFD says. MORE: khou.com/article/news/l... #HTownRush #KHOU



xplosion at Houston

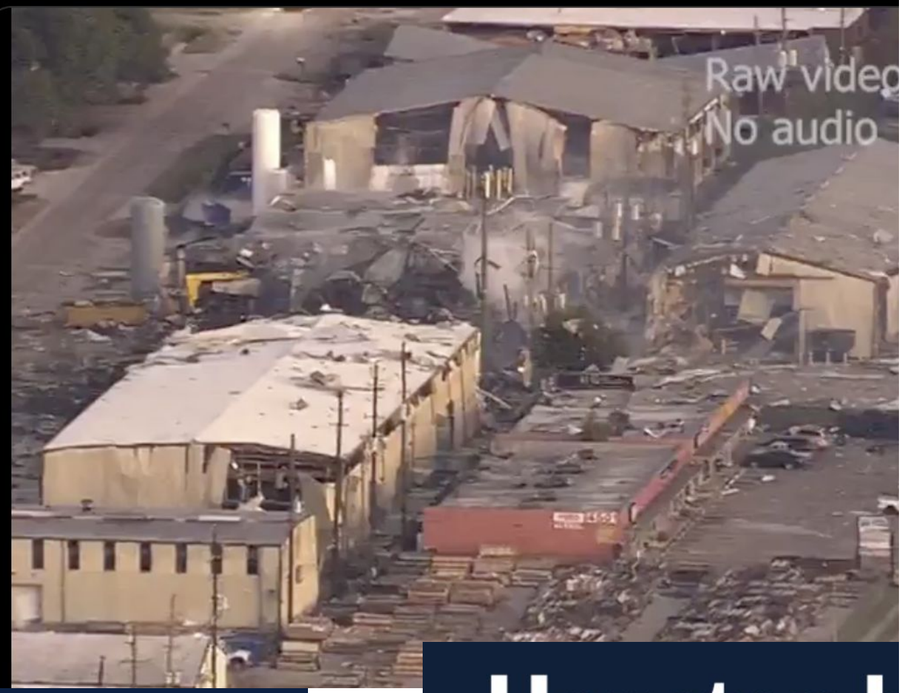
dents from sleep in the early hours of
g windows and scattering debris. The
d to be employees of the plant, officials

Houston building explosion: 2 dead, others hurt in blast that was felt for miles

"It knocked us all out of our bed, it was so strong," said Mark Brady, who lives in a neighborhood near the blast site.

KHOU 11 News Houston
@KHOU

Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explosion in northwest Houst resident taken to the hospital, 1 worker missing, HFD says. MORE: khou.com/article/news/l... #HTownRush #KHOU



Houston b rs hurt in blast that was felt for miles

"It knocked us all out of our bed, it was so strong," said Mark Brady, who lives in a neighborhood near the blast site.

KHOU 11 News Houston
@KHOU

Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explosion in northwest Houst resident taken to the hospital, 1 worker missing, HFD says. MORE: khou.com/article/news/l... #HTownRush #KHOU

fd6270 • 5y ago •

Nothing like the weekly Texas chemical plant explosion on r/CatastrophicFailure

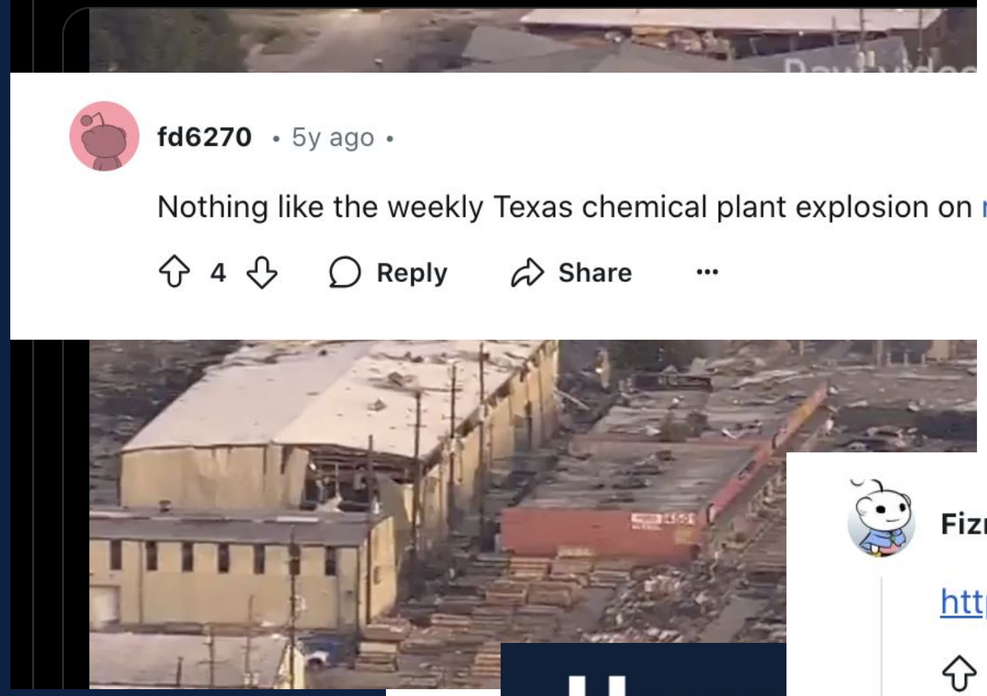
4 Reply Share

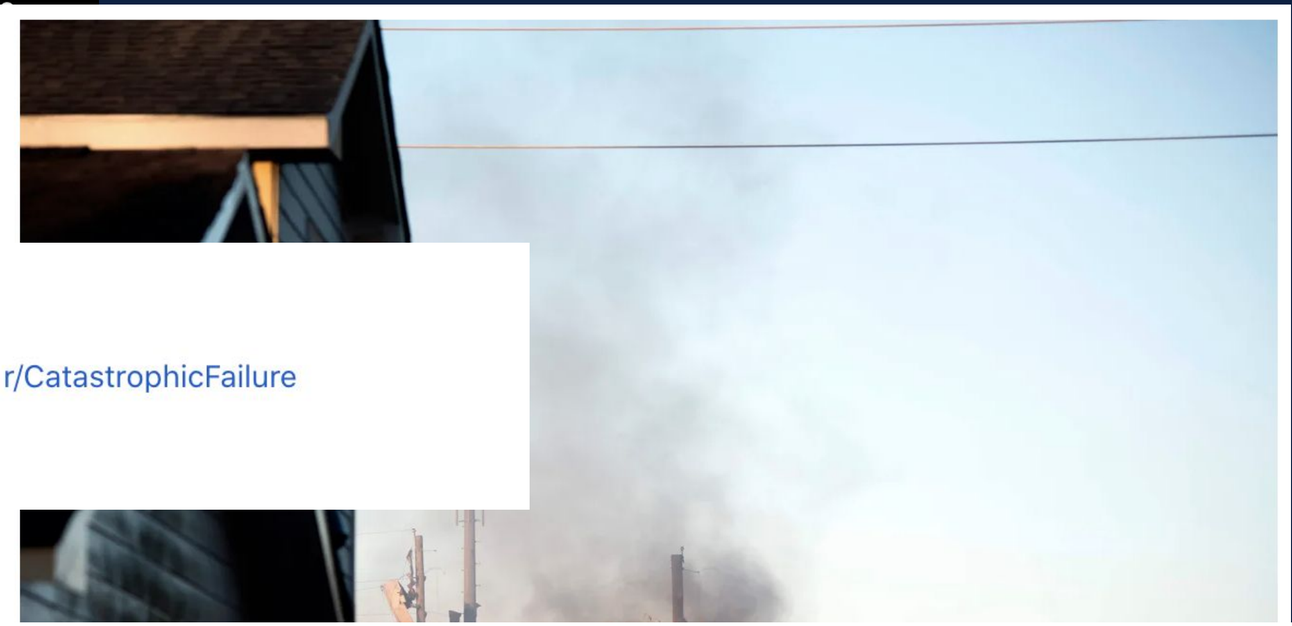
Houston b rs hurt in blast that was felt for miles

"It knocked us all out of our bed, it was so strong," said Mark Brady, who lives in a neighborhood near the blast site.

KHOU 11 News Houston
@KHOU

Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explosion in northwest Houst resident taken to the hospital, 1 worker missing, HFD says. MORE: khou.com/article/news/l... #HTownRush #KHOU





fd6270 • 5y ago •

Nothing like the weekly Texas chemical plant explosion on r/CatastrophicFailure

4 Reply Share

Fizney • 5y ago •

https://twitter.com/battlenub19/status/1220660538453172225?s=21 video of the explosion

16 Reply Share

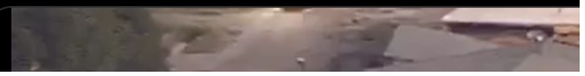
7 more replies

Houst
hurt in blast that was felt for miles

"It knocked us all out of our bed, it was so strong," said Mark Brady, who lives in a neighborhood near the blast site.

KHOU 11 News Houston
@KHOU

Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explos resident taken to the hospital, 1 worker miss khou.com/article/news/l... #HTownRush #K



fd6270 • 5y ago •

Nothing like the weekly Texas chem

4 Reply Share

53172225?s=21 video of the explosion

Ho hu miles

"It knocked us all out of our bed, it was so strong," said Mark Brady, who lives in a neighborhood near the blast site.

KHOU 11 News Houston
@KHOU

Here's our first daylight look at the aftermath. Several buildings were leveled or destroyed in this morning's explosion in northwest Houston resident taken to the hospital, 1 worker missing, HFD says. MORE: khou.com/article/news/l... #HTownRush #KHOU

fd6270 • 5y ago •

Nothing like the weekly Texas chemical plant explosion on r/Catastroph

4 Reply Share ...

Two Dead in Explosion at Houston Plant

Houston building explosion: 2 dead, oth hurt in blast that was felt for miles

"It knocked us all out of our bed, it was so strong," said Mark Brady, who lives in a ne near the blast site.

2020 Houston explosion

Date	January 24, 2020
Location	Houston, Texas, U.S.
Coordinates	29.8369°N 95.5456°W
Deaths	3
Non-fatal injuries	18
Property damage	200 nearby buildings damaged

On January 24, 2020, a building at Watson Grinding and Manufacturing in northwest Houston, Texas, United States, exploded at 4:24 a.m.[1][2] Debris was scattered as far as one-half mile (0.8 km),[3] and approximately 200 nearby houses and businesses were damaged.[4] Officials asked local residents to search for debris and body parts to assist with an investigation into the explosion's cause.[5] An absence of zoning ordinances separating industrial areas from residences is known to prevail in the vicinity of the explosion.[1]

Two deaths were reported on the morning of the incident.[6] Both men were employees of Watson Grinding and Manufacturing.[5] A third man, whose home was impacted by debris from the explosion, died from his injuries on February 5.[7]

What’s On Tap

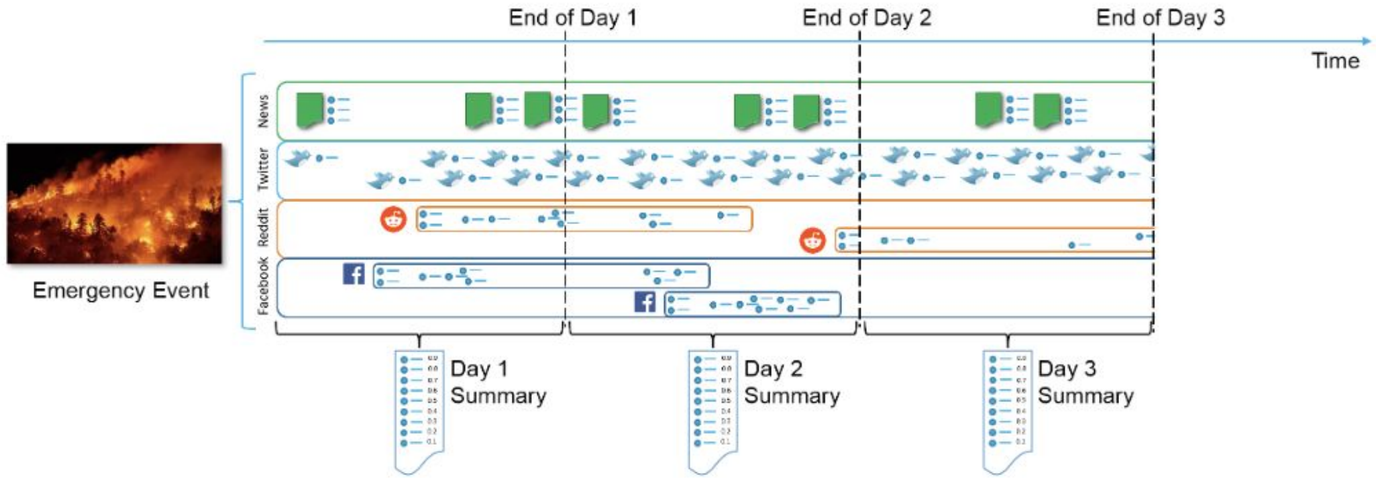
Introduction	Why CRISISFacts?
Backend Design	The behind the scenes code!
Interface	Making code user-friendly!
Demo	See it in action!

Introduction

Developing Summarization Technologies For Emerging Crisis Events

We aim to address the challenges of extracting, organizing, and ranking relevant information from the CRISISFacts data streams.

Our goal is to provide concise, actionable summaries of events that are tailored to crisis responders.



Data Subsetting

Utilizing subsets of the CRISISFacts dataset that focus on specific crisis events, including:

Twitter Data

Reddit Data

News Article Data

eventID	Title	Type	Tweets	Reddit	News	Facebook
CrisisFACTS-010	Houston Explosion, 2020	Accident	58,370	5,704	2,175	6,281

Literature Review

Several recent studies have informed our approach, including:

1. **McCreadie et al. (2023)**: Introduction of the CRISISFacts framework, highlighting the importance of multi-platform event summarization during crises

   (Link - https://idl.iscram.org/files/mccreadie/2023/2529_McCreadie+Buntain2023.pdf)

2. **Khattab and Zaharia (2020)**: ColBERT's late interaction mechanisms for efficient and effective text retrieval.
   (Link - https://people.eecs.berkeley.edu/~matei/papers/2020/sigir_colbert.pdf)

3. **Rudra et al. (2016)**: This work explores extractive summarization techniques for situational tweets, providing insights into processing high-volume social media data during crises.

   (Link - https://mimran.me/papers/Summarizing_situational_tweets_HT2016.pdf)

Methodology

Data Ingestion and Preprocessing

Using Spark and Python to clean and preprocess the data

Feature Engineering

Employing dimensionality reduction and clustering techniques to identify key information clusters.

Summarization Framework

Developing a hybrid system that combines extractive methods (for quick relevant snippet retrieval) and neural based models (for context-aware ranking and abstract summarization).

Interface Development

Creating an interactive, user-friendly search interface.

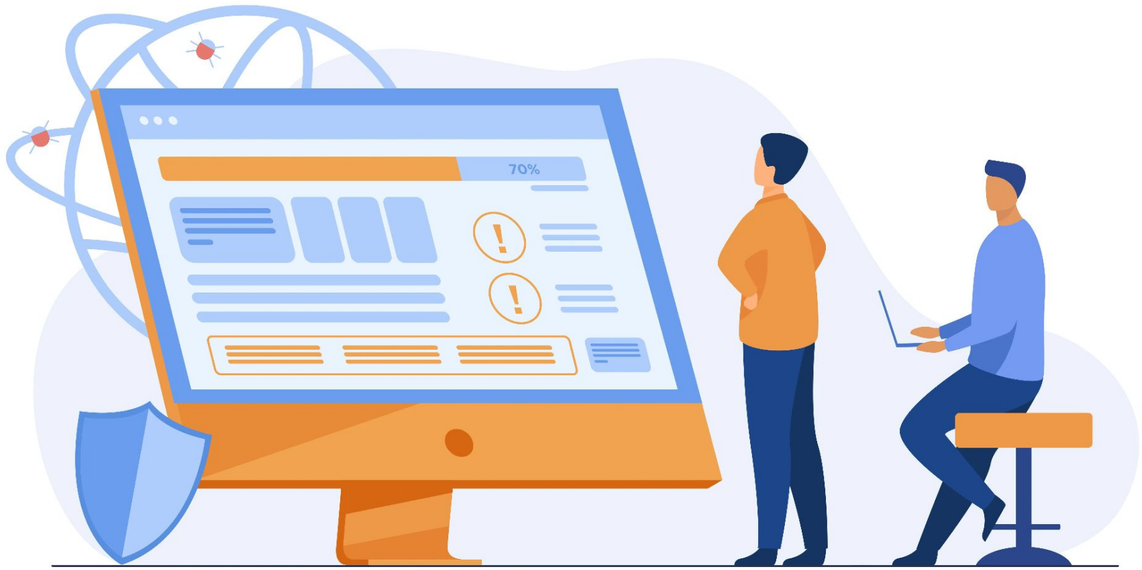
Evaluation Strategy

Scoring With Automated and Manual Metrics:

ROGUE and BERTScore

Fact Matching

Redundancy Ratio



Backend Design

Interface Design

Demo

Conclusion

Takeaways

Accurate Information is important for effective response!

Scalable summarization as well as a clean interface can tailor to the needs of the user.

Application with the user in mind!

There are many ways to contribute to research in important fields.

Thank You!