Building an Emergency Dispatch Heatmap

ATL Team
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Roadmap

- Background
- Framework
- What we built
- Next Steps
- Questions

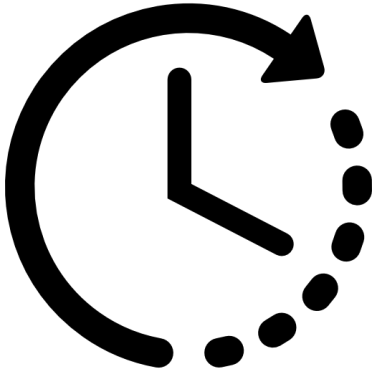
Background

“This tool will utilize **live police radio** reports to **identify hot spots** representing locations … where the police and first-respondents were called **to provide assistance** related to the event.”

– Problem 10 description

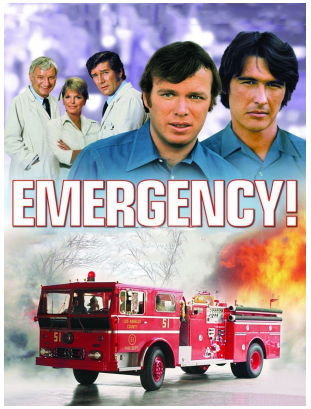
Disaster responders need to know where the action is...

...and emergency dispatch radio broadcasts are an ideal data source.



Real-time Data

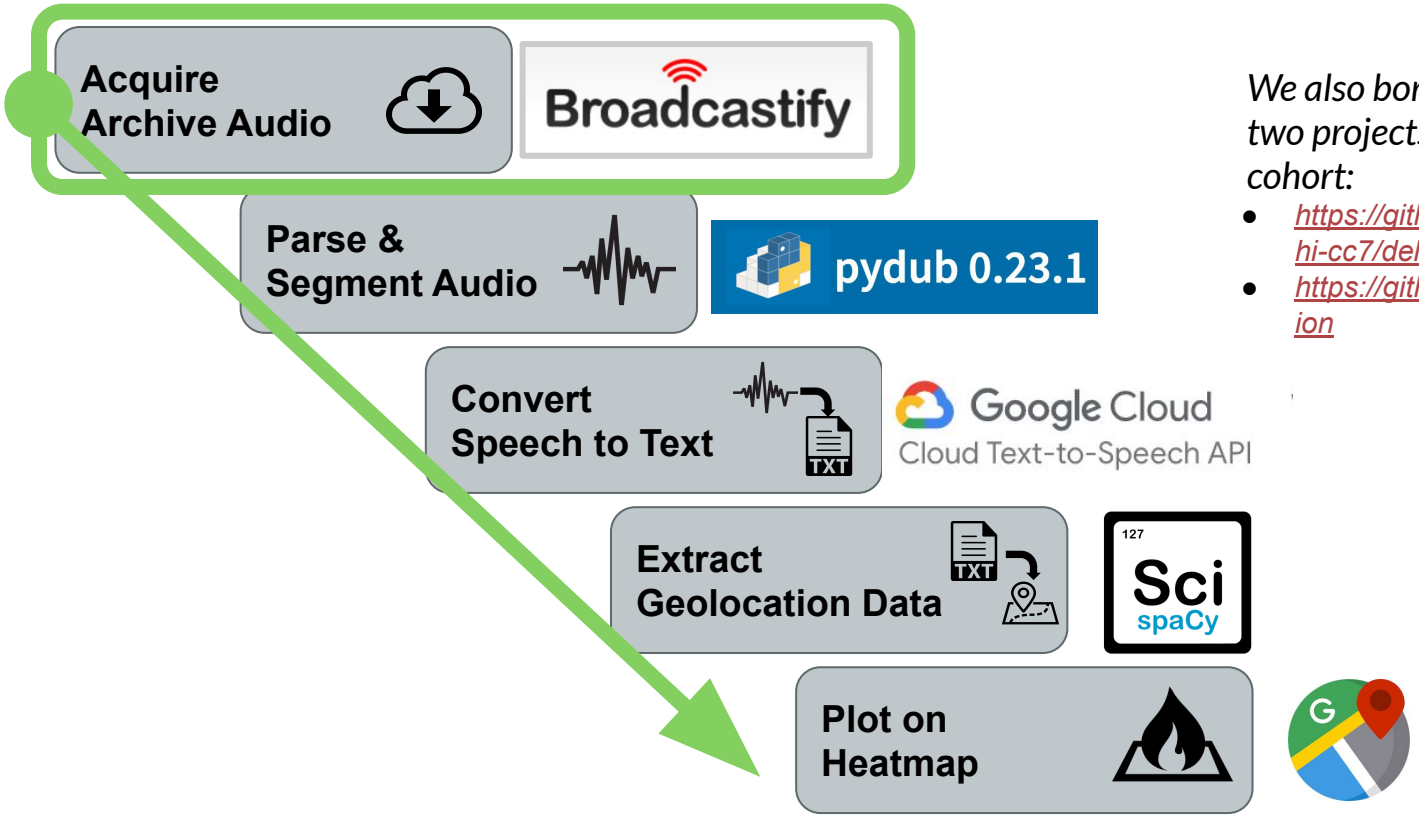
Location Integrated



Real Emergencies

Framework

Our framework was linear and leveraged many existing tools and resources.



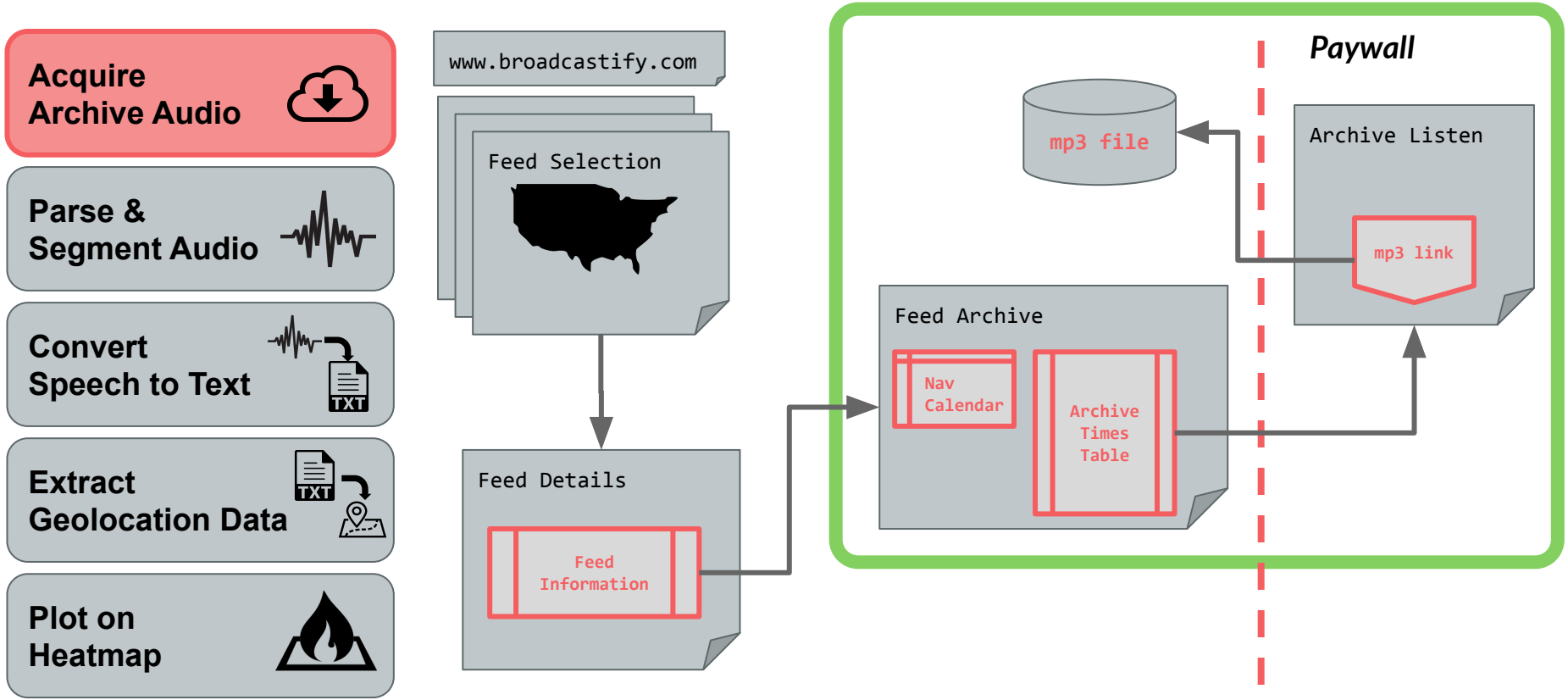
We also borrowed extensively from two projects from the previous DSI cohort:

- *https://github.com/project-red-siren-dsi-chi-cc7/deliverables*
- *https://github.com/mchbmn/radio-to-location*

What We Built

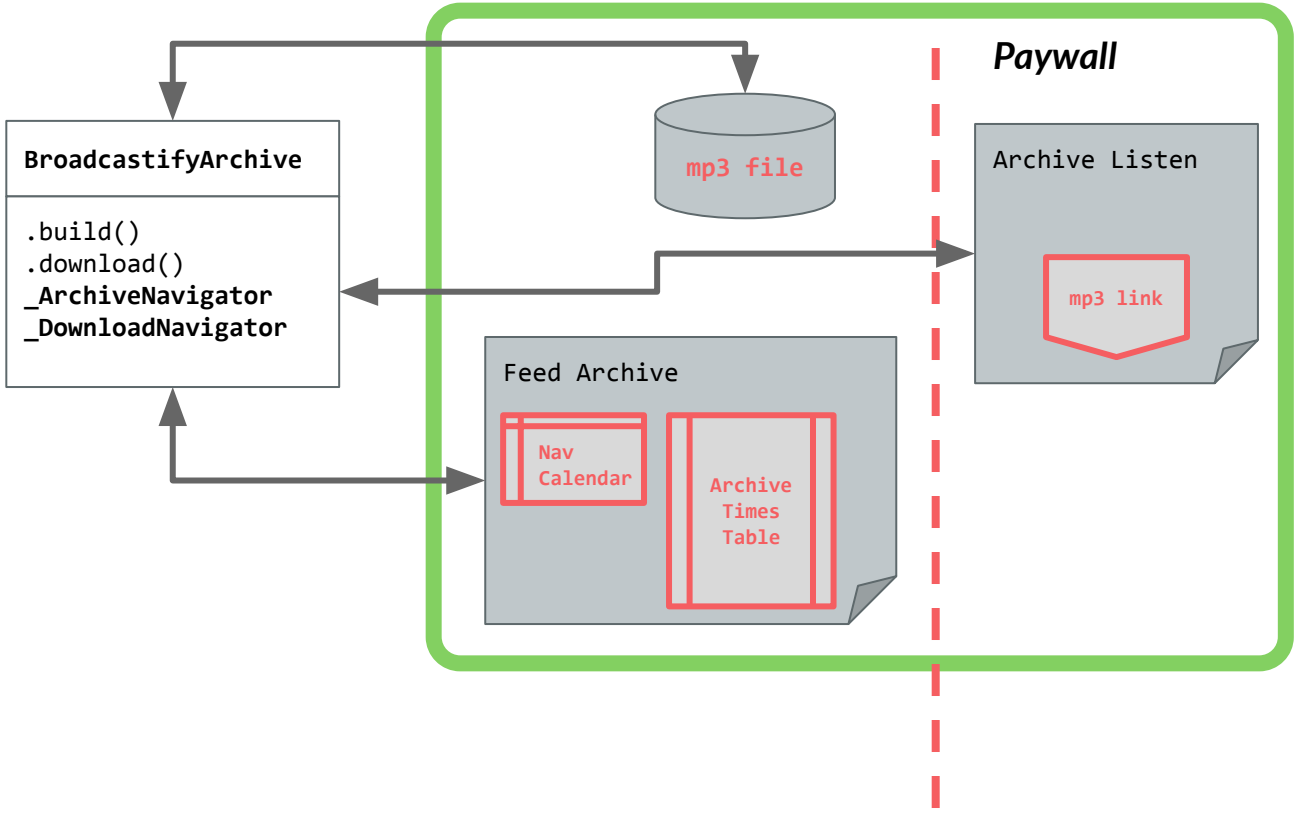
The `BroadcastifyArchive` class

Downloading large numbers of archive files for model training is a tedious manual effort.



Downloading large numbers of archive files for model training is a tedious manual effort.

- Acquire Archive Audio
- Parse & Segment Audio
- Convert Speech to Text
- Extract Geolocation Data
- Plot on Heatmap



Demo

End-to-end mapping

We used pydub to handle audio processing.

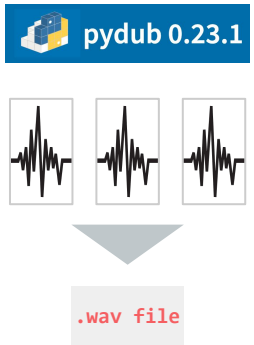
Acquire
Archive Audio

**Parse &
Segment Audio**

**Convert
Speech to Text**

**Extract
Geolocation Data**

**Plot on
Heatmap**



We combined google cloud's speech-to-text API and spaCy natural language processing.

Acquire
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Parse &
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**Convert
Speech to Text**

**Extract
Geolocation Data**

**Plot on
Heatmap**

	transcripts	confidence
0	I was just	0.502997
1	our brothers are critical for 1636 thank you	0.842904
2	is going to be	0.652573
3	to drive robson's plane set the driver knocked...	0.700766
4	Market 11:30 high was 31130 hi	0.803496
5	drat or kind of somebody can price and stay fa...	0.772701
6	Peridot we close races here	0.680532
7	Library 612 Smithfield Street between 6th Aven...	0.839220
8	down there markets weren't	0.785316

We've plotted hotspots using google maps, but we're migrating to Folium.

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**Plot on
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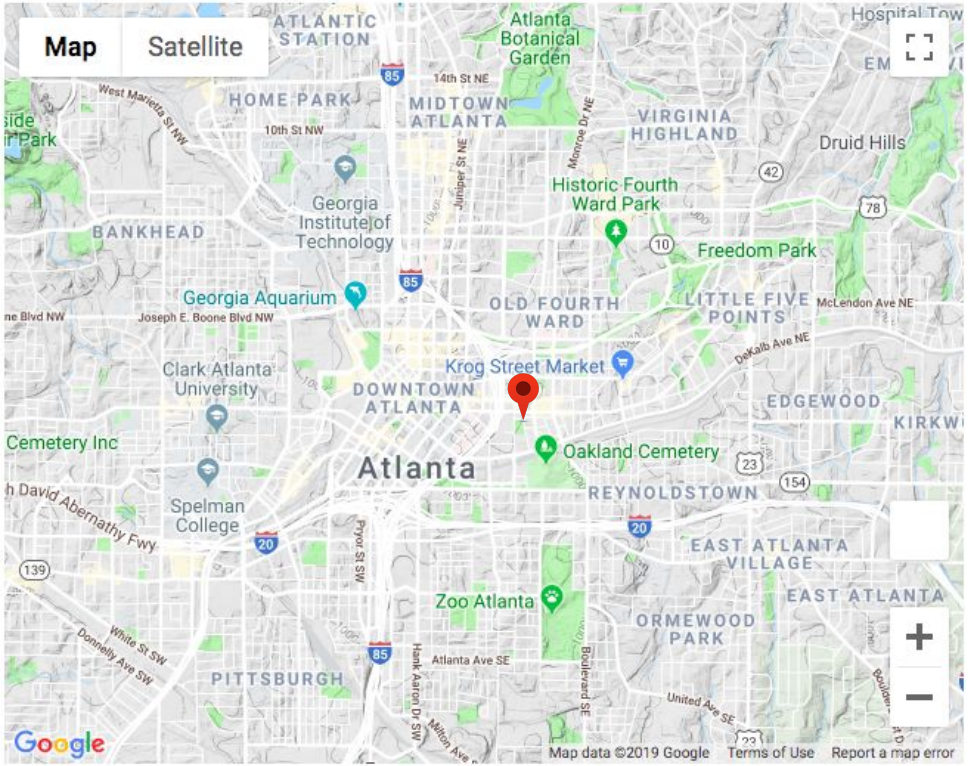


Next Steps

Many opportunities exist to advance the state of the art in future cohorts.

End-to-End Mapping

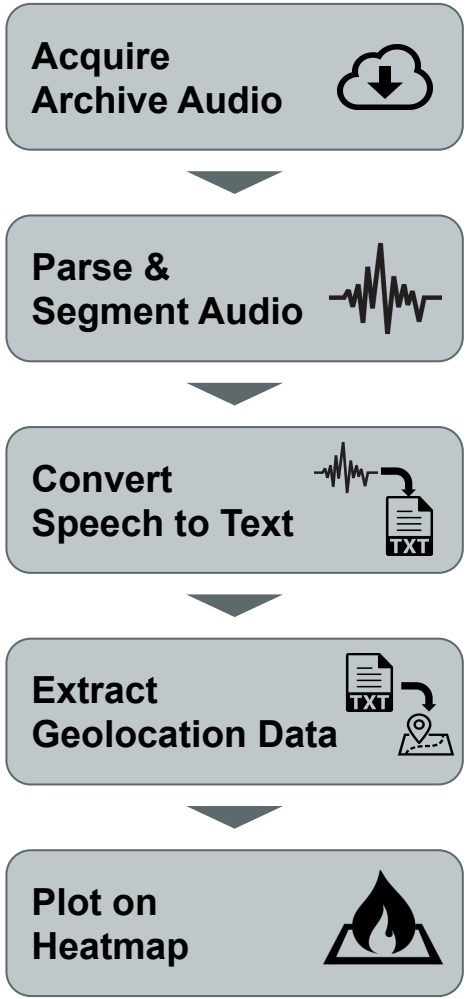
- Find audio with more references to locations
- Automate locality detection based on feed (to grab local streets for contextual NLP)
- Speed up parsing/segmenting audio files
- Audacity
- Finish migration to Folium

`BroadcastifyArchive` Class

- Flexible date/time selection on `.build()` method
- De-couple mp3 filename scraping from archive build; do it during download instead
- Multithread mp3 filename acquisition & mp3 download
- Create a setup script (`pip install bart`) to gracefully handle dependencies
- Built-in pickler/de-pickler?

Questions

Appendix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