CROWDSOURCED VIDEO CLASSIFICATION

Website for accumulating a trusted set of labeled clips.

THE NEED FOR CLASSIFIED DATA

- Our client, Xandr, an AT&T company, plans to create a system to place ads relevant to the main content of online video or TV broadcasts.
- Relevant ads would keep audiences engaged with the content they're viewing and would allow companies to better target their ads.
- To create such a system, they first need a large sample of videos that have already been classified according to their content.
- Our mission: create a website to facilitate the generation of this classified data set that Xandr can use to gather the information necessary to create their system.

BENEFITS OF CROWDSOURCING

- Generating a set of labeled videos would be tedious for one person, and their personal bias could affect the labels that are chosen.
- By crowdsourcing, which is letting the general public do work for you, larger amounts of data can be done in shorter amounts of time.
- Crowdsourcing can also eliminate the biases of individual volunteers by looking at trends and taking the majority selection of the "ground truth" proper label for each video.

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DETERMINING EMOTION

- The goal of the website is to associate an emotion label with each video.
- As more votes are cast on each video, a clear pattern emerges. Each user might have their own biases, but when many people vote, a majority can decide with certainty which label is the proper one to associate with the video.
- Once enough votes are cast, extra data becomes unnecessary. Our client requested that the maximum number of votes per video be 5.
- Figure 1 shows a bar graph of three videos in our sample that have reached the magic number. As is apparent, Video 1 may be clearly associated with Sadness, and Video 3 may be clearly associated with Disgust. Video 2 is tied, so Neutral would be selected.

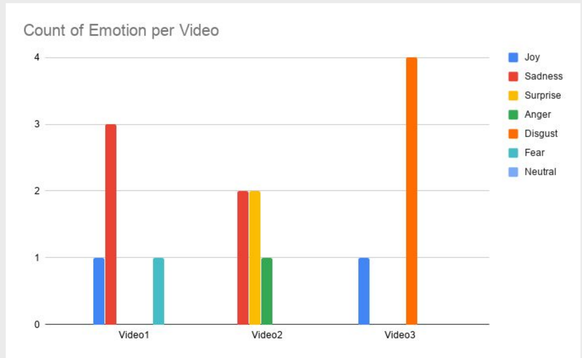

Figure 1: Graph of average emotion type per video

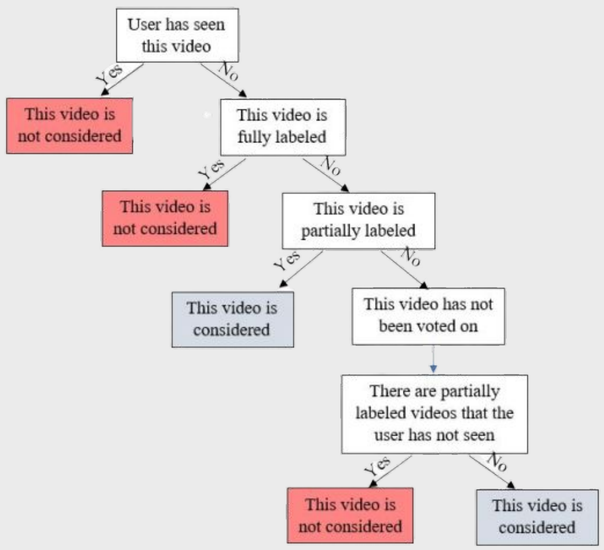

Figure 2: Video selection decision tree

MAXIMIZING LABELED VIDEOS

- Consider this: ten people each watch and classify five videos. It is better to have ten videos with five votes each than fifty videos with one vote each, since more contributors on any single video makes the selection more certain. How do we do this?
- Figure 2 shows a decision tree for whether or not we consider a video to show to a user. Note that videos that have been seen by the user or have enough votes to be certain about their classification ("fully labeled") are not considered.
- Within these constraints, partially labeled videos are prioritized over unseen videos.
- In this way, new users will make partially labeled videos more certain before starting the labeling of otherwise unseen videos.

TECHNOLOGIES

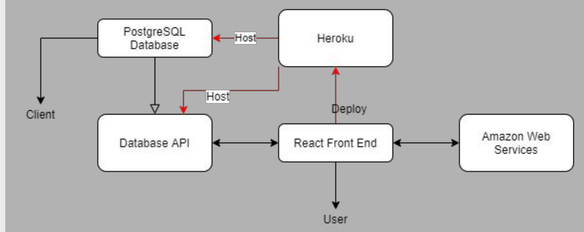

Figure 3: Flow chart of website logic

- Heroku, a "Platform as a Service", is used to deploy the front end of the website and host the database and database Application Program Interface (API).
- The front end goes through the API to store votes and usernames in the database as well as to select new videos to show the user.
- Amazon Web Services hosts the videos; the front end communicates directly with it to provide them to the user.

ABOUT US

- We are a group of computer science students who aspire to be software engineers.
- We want to create products just like this one that can help people with their every day tasks.

Figure 4: Group Members. From left to right: Jared Beale, Sam Young, Conner Maddalozzo

ACKNOWLEDGMENTS

- Xandr, our client, created the components we used to construct our website, answered our questions, and gave input on design decisions.

xandr