

VisualCommunity

User Manual

Data Collection and Visualization Tool for
Gaining Community Knowledge
from Videos and Narratives.

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- Software Website: <http://vis.cs.kent.edu>

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VisualCommunity Website: <http://vis.cs.kent.edu/VisualCommunity/>

VisualCommunity website image (coming soon)

I. Overview

The study of a community where people live, work, and interact can involve a myriad of question from multiple perspectives. Knowledge can be gained from spatially coded data including streetview videos, photos, and speech narratives that accompany these data from local residents, workers, and experts. However, they lack a convenient tool that can integrate multiple videos of a community for analysis. To address these challenges, we have developed a data capture and visualization software named “VisualCommunity”.

VisualCommunity is a data collection and visualization software tool that bridge the gap between the diversity of researcher and educator needs and data infrastructure challenges often encountered in the community or field. VisualCommunity software consists of a mobile APP for data capture and visualization system for interactive exploration.

- Data capture on Mobile APP
- Visual Analytic Interface

Figure 1 shows the VisualCommunity software pipeline.

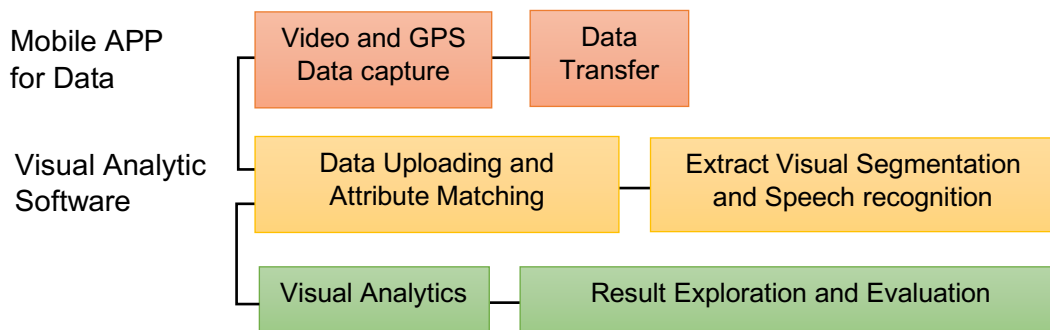


Figure 1: VisualCommunity data capture and visualization software pipeline

II. Geospatial Datasets and Multimedia Data Types

A Geospatial dataset consists of a set of trips and multimedia sources. A trip refers to a trajectory in a specific period of time defined by users. A trip includes a consecutive set of spatial sampling points along with latitude, longitude, and timestamp.

A Multimedia data types consist of a set of videos and audios. The videos illustrate user's field of views. In addition, the audio recorded a set of narratives such as user's speech or ambient voices.

A. Raw Trajectory Data (.CSV table)

VisualCommunity allows users to upload their raw GPS datasets in CSV (comma-separated values). Each GPS data consists of sequences of sampling point in every one second. The values should include geolocations (longitude, latitude), date, time, and media time (optional). Here the media time refers to the multimedia time such as video and audio time.

B. Multimedia Data (.MP4 or .MOV video)

In VisualCommunity, users are able to upload their video clips in .MP4 or .MOV format. The video should illustrate their moving path such as walking or driving. We are highly recommended user to record their video at 720p or 1080p.

C. Data Capturing Tool

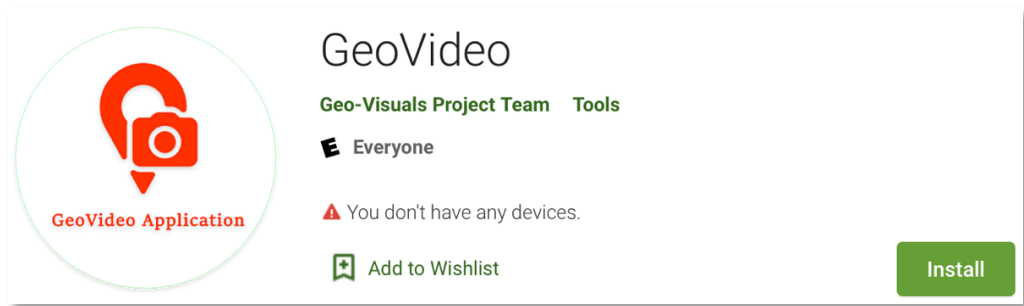
VisualCommunity provides a flexible Mobile APP for users to capture both of above datasets named "GeoVideo". This GeoVideo mobile APP is available on both Android and iOS operating system. Users can install from links provided below:

- Android: <https://play.google.com/store/apps/details?id=com.nlapps.geovideo&hl=en>
- iOS: <https://apps.apple.com/us/app/geovideo/id1492419929>

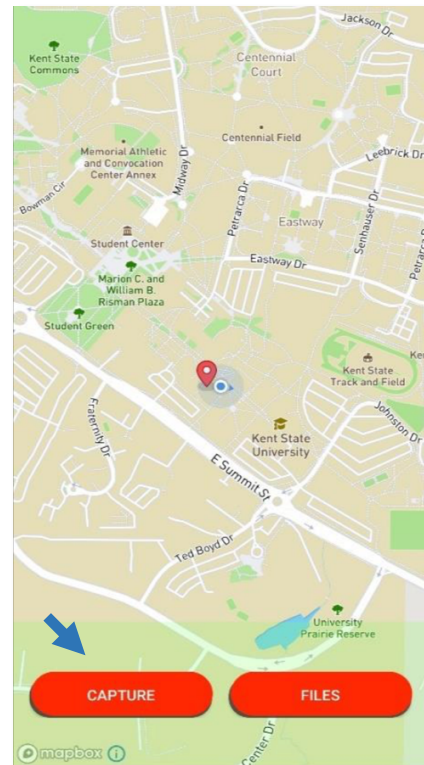
III. Data Capture and Data Transferring Guide

A. Mobile APP installation and capture

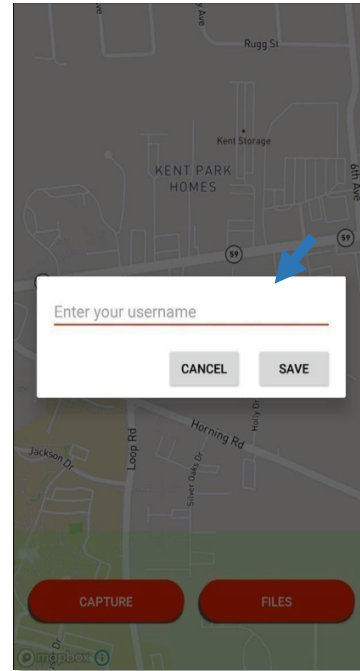
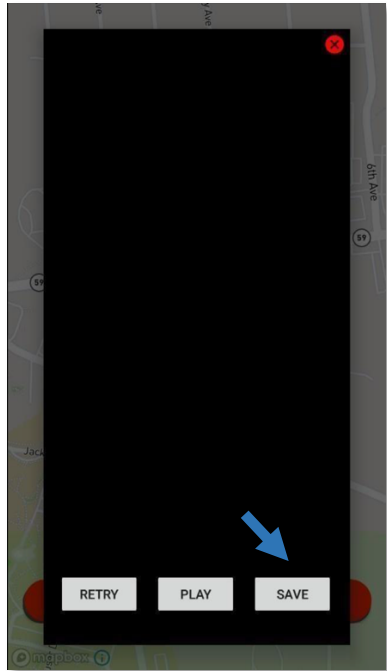
1. Install application on any platform (Android or iOS).



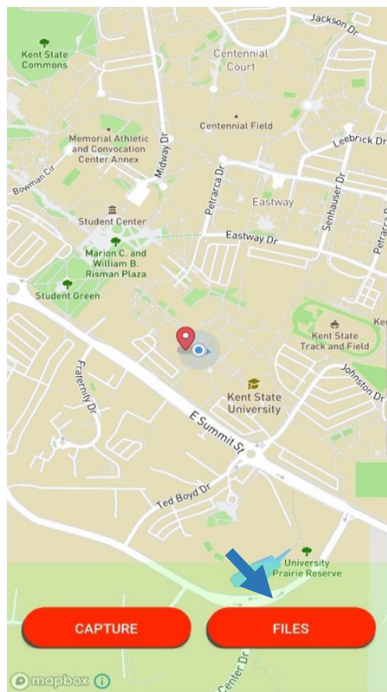
2. Once installed, open the application to start (Left). Click on **CAPTURE** to start capture video and trajectory data (Right).



- When finished recorded users can select to **RETRY** to retry record, **PLAY** to check recorded video, or **SAVE** to save recorded video (Left). Once saving the video, users can input any name for their recorded file (Right).



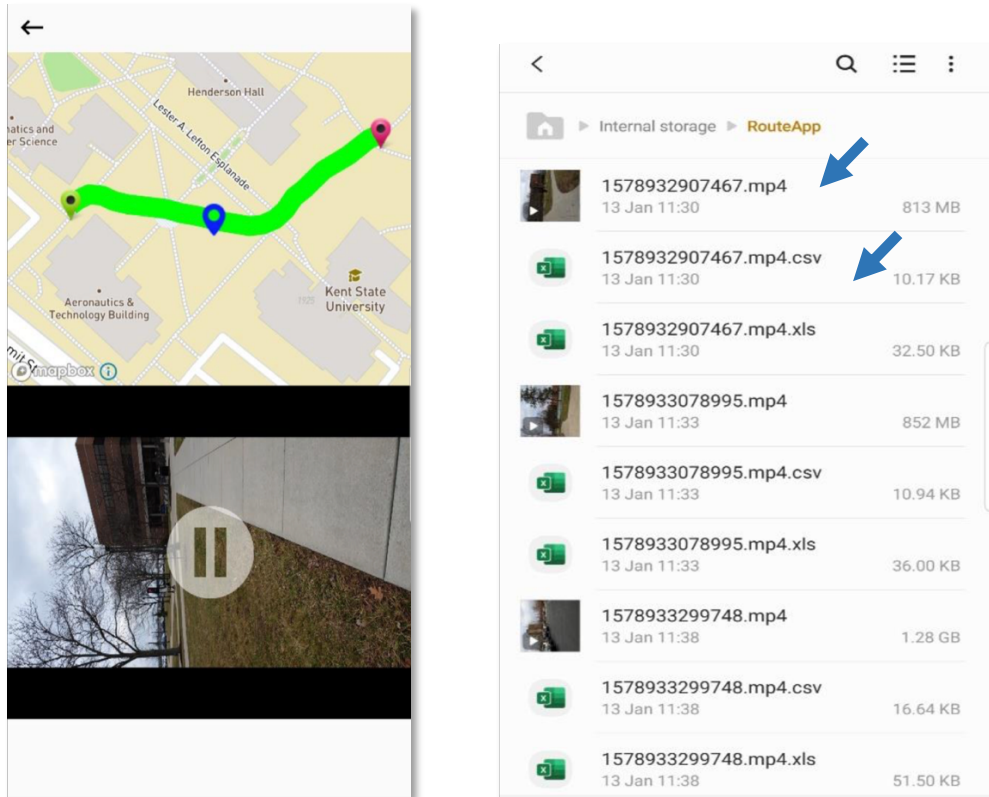
- To check all saved data files, click on **FILES** to see the list of the captured data.



3 Files Size 3124679.12 (MBs)

	Date	Duration	City
	01-13-2020	00:03:48	Kent
	Time	Size	Name
	11:38:56	1378610.75 MB	file3
	01-13-2020	00:02:28	Kent
	Time	Size	Name
	11:33:55	893586.06 MB	file2
	01-13-2020	00:02:21	Kent
	Time	Size	Name
	11:30:58	852482.31 MB	file1

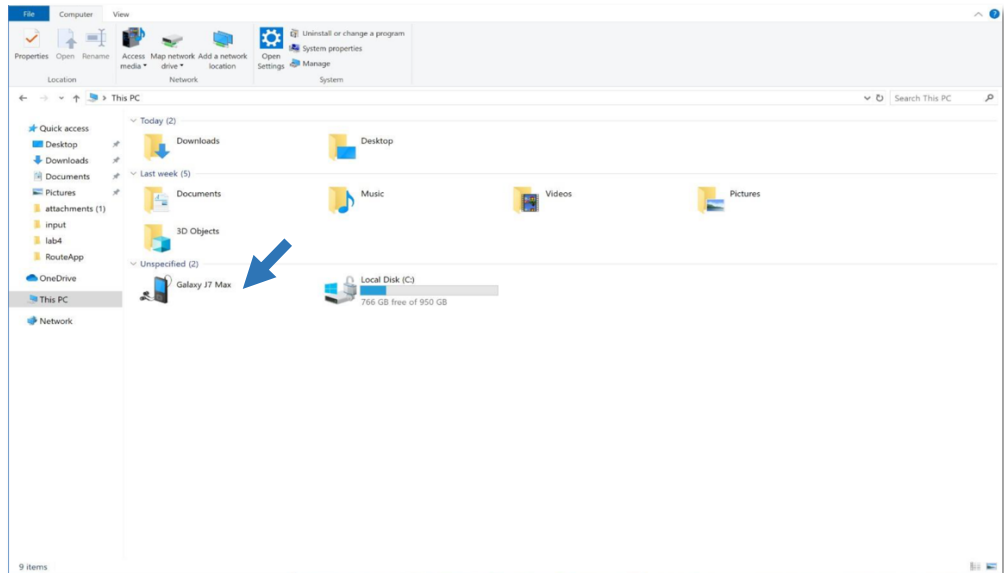
5. Click on any row on the list of the file will show the details of the captured video, which includes captured trajectory and video (Left). Both .CSV and .MP4 are stored in the file system named with its unique id (Right).



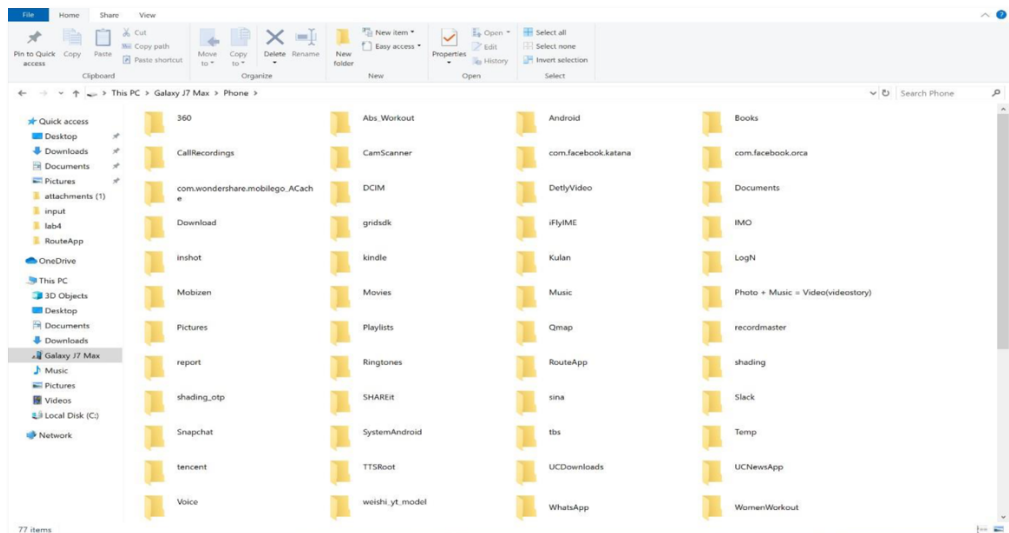
6. Connect mobile to computer via USB port or any available computer's port.

B. Data Transfer from Mobile APP to computer

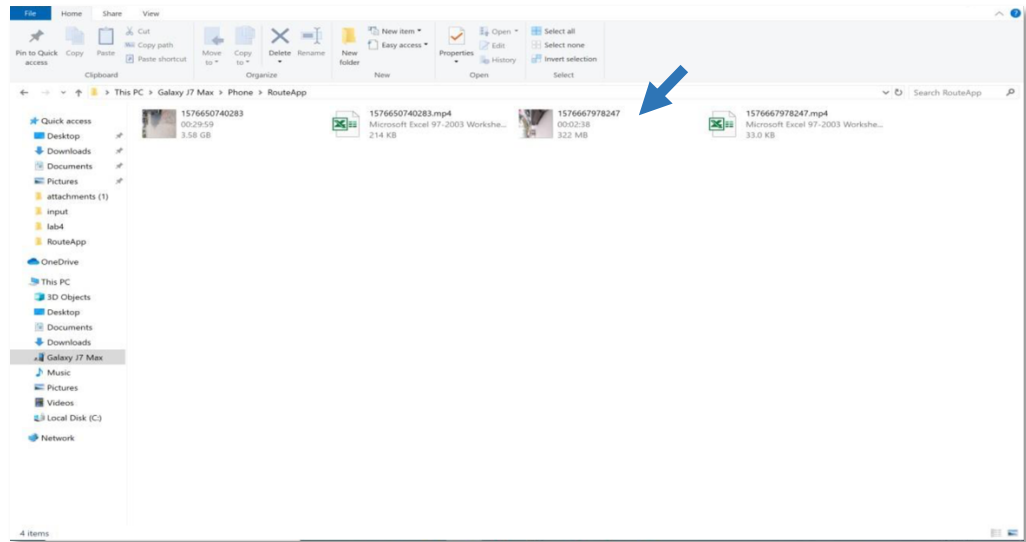
1. Go to File Explorer (Windows) or Finder (Macintosh). User will see your mobile icon.



2. Locate GeoVideo Folder to transfer recorded .CSV and .MP4 data to computer.



3. On computer, drag both .CSV and .MP4 data to any location of interest.



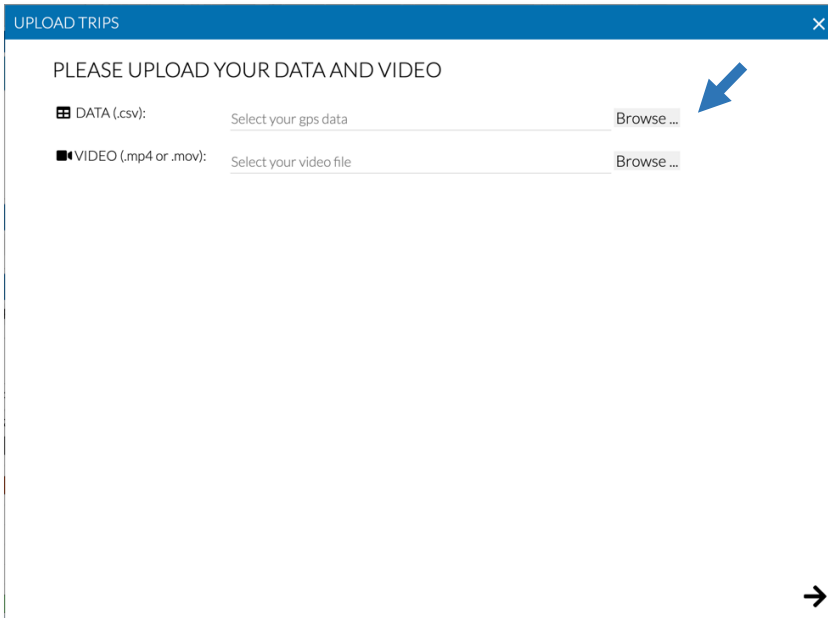
IV. Visual Analytic Software

A. Upload Data

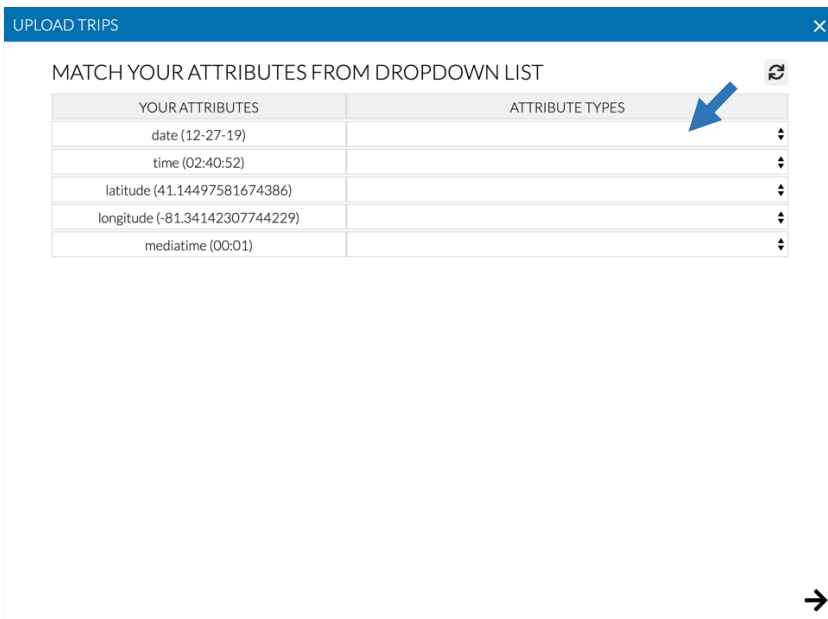
1. Click on **UPLOAD** button on the navigation bar

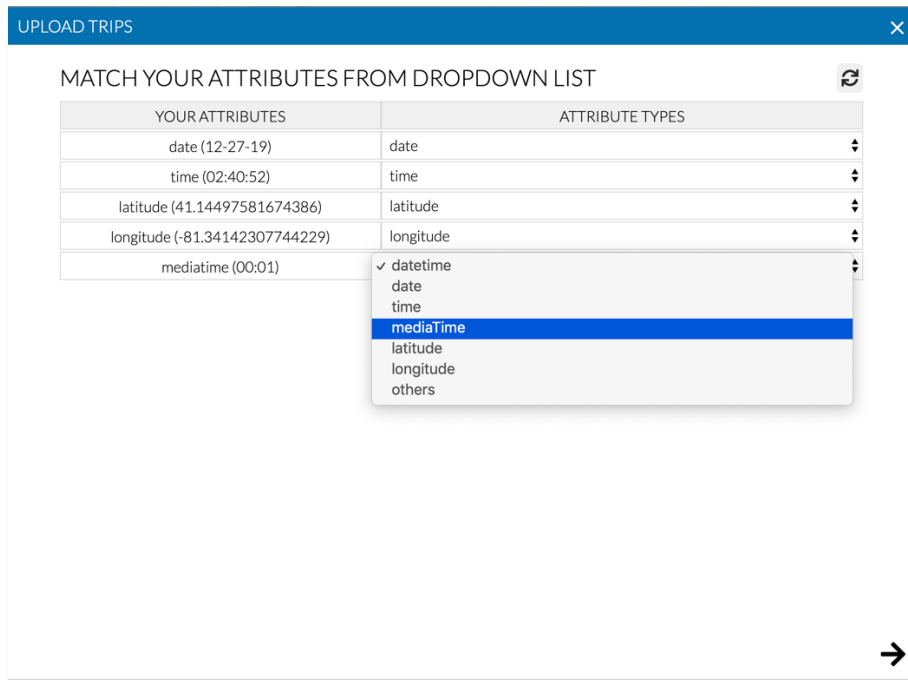


2. Click on **BROWSE** to select .CSV file and .MP4 file and click → icon to continue.

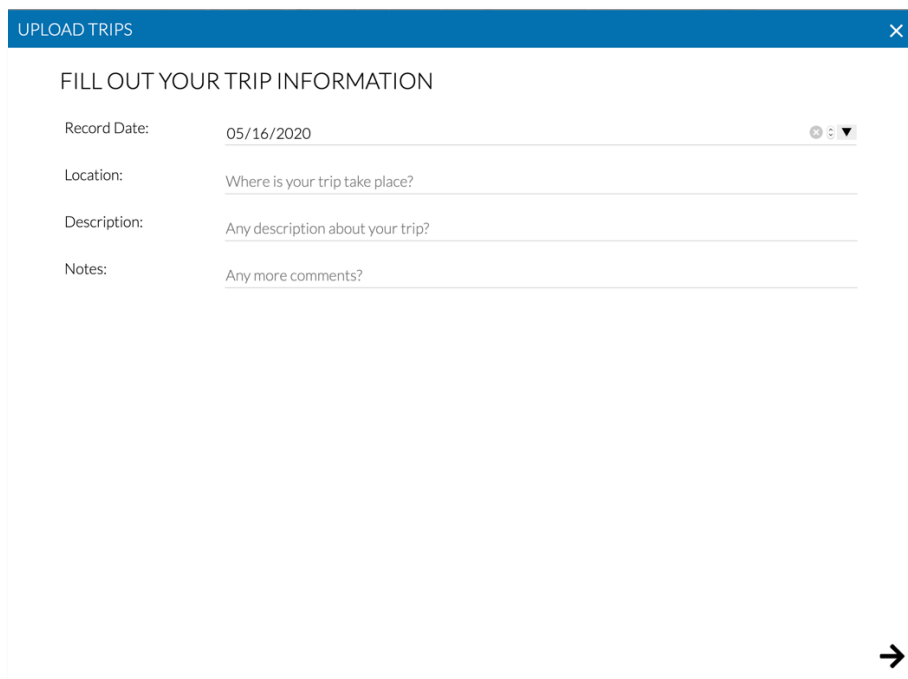


3. To match data attributes with VisualCommunity supported attribute, select on the dropdown list to match on both sides.

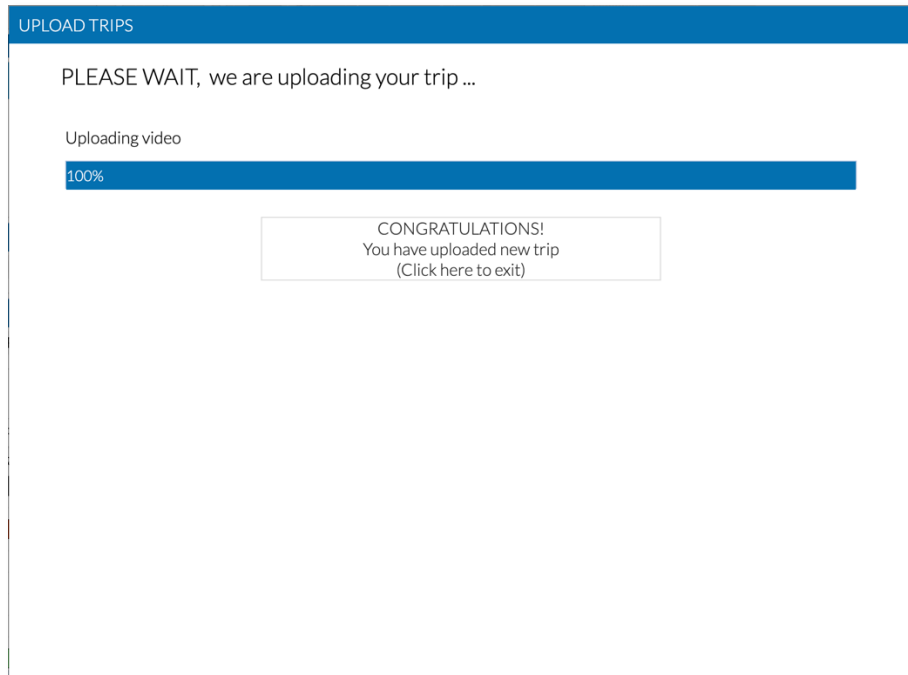




4. Next, users can provide any information about their recorded data such as recorded date, description, and comments.

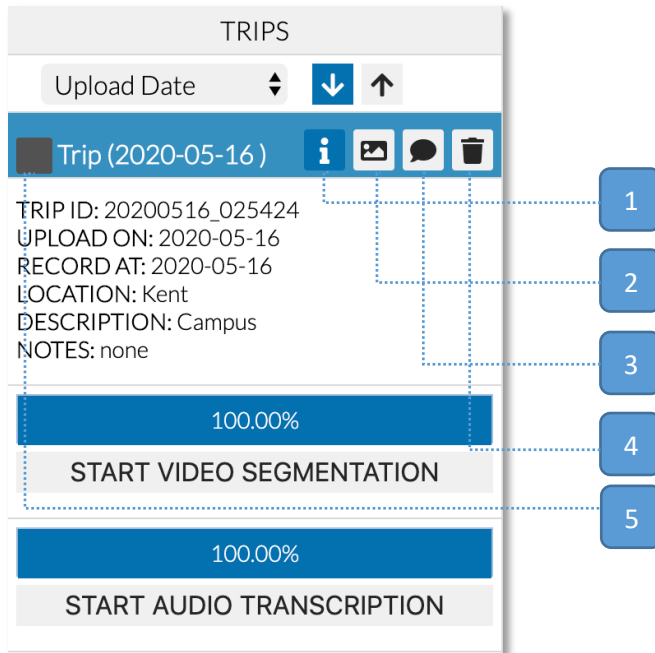


5. Click on → icon to start uploading data and wait until it done.

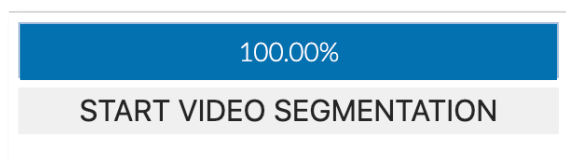


B. Trips List and AI-Based Data Processing

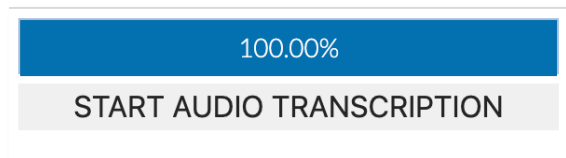
Once the data is uploaded, it will generate a new item in the TRIP list on the left panel. This panel help user to manage recorded trip including process visual segments, extract speech narratives, or remove uninterested trip.



1. Click on **i** icon to see information about selected trip.
2. Click on **Image** icon to process AI-Based visual segmentation.

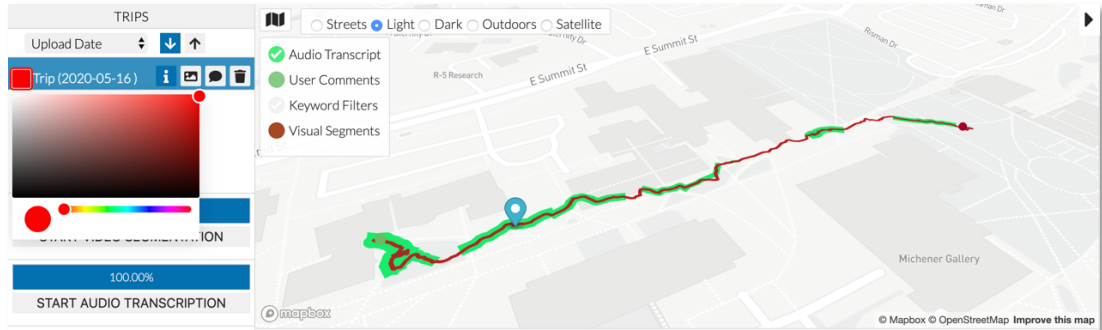


3. Click on **Dialog** icon to process AI-Based speech and narrative extraction.



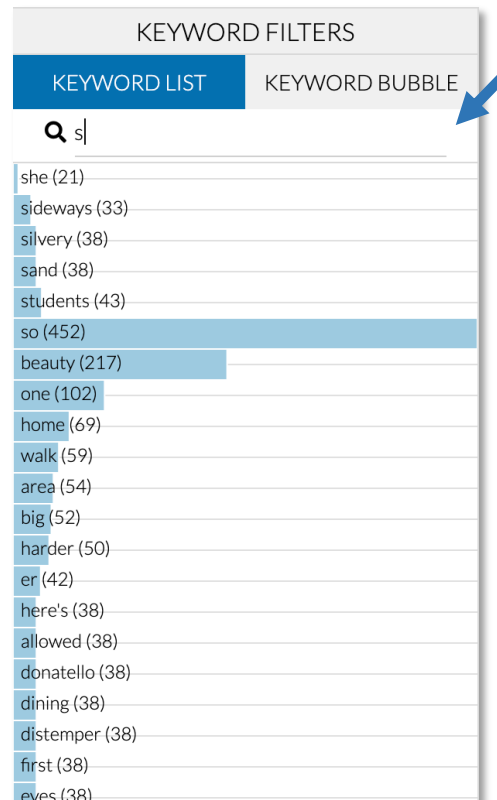
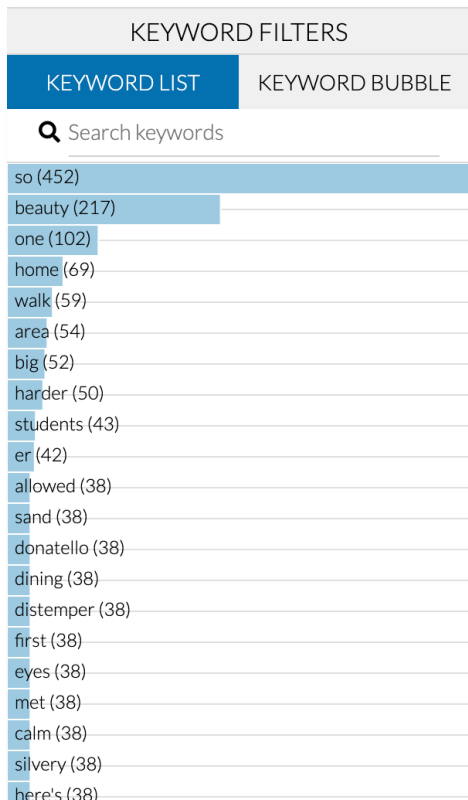
4. Click on **Trash** icon to remove any selected trip.

- User can also adjust color of the selected trip. Adjusting color on the TRIP list will corresponding to the Map View.

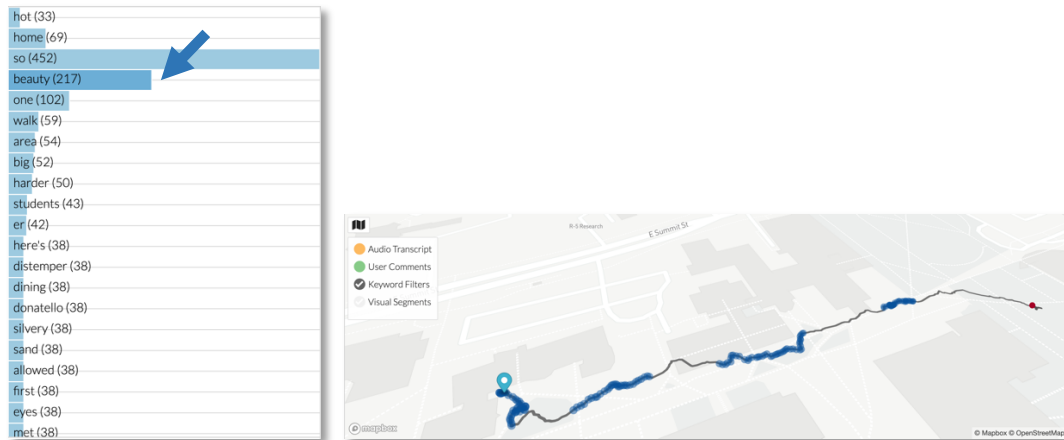


C. Keyword Filters

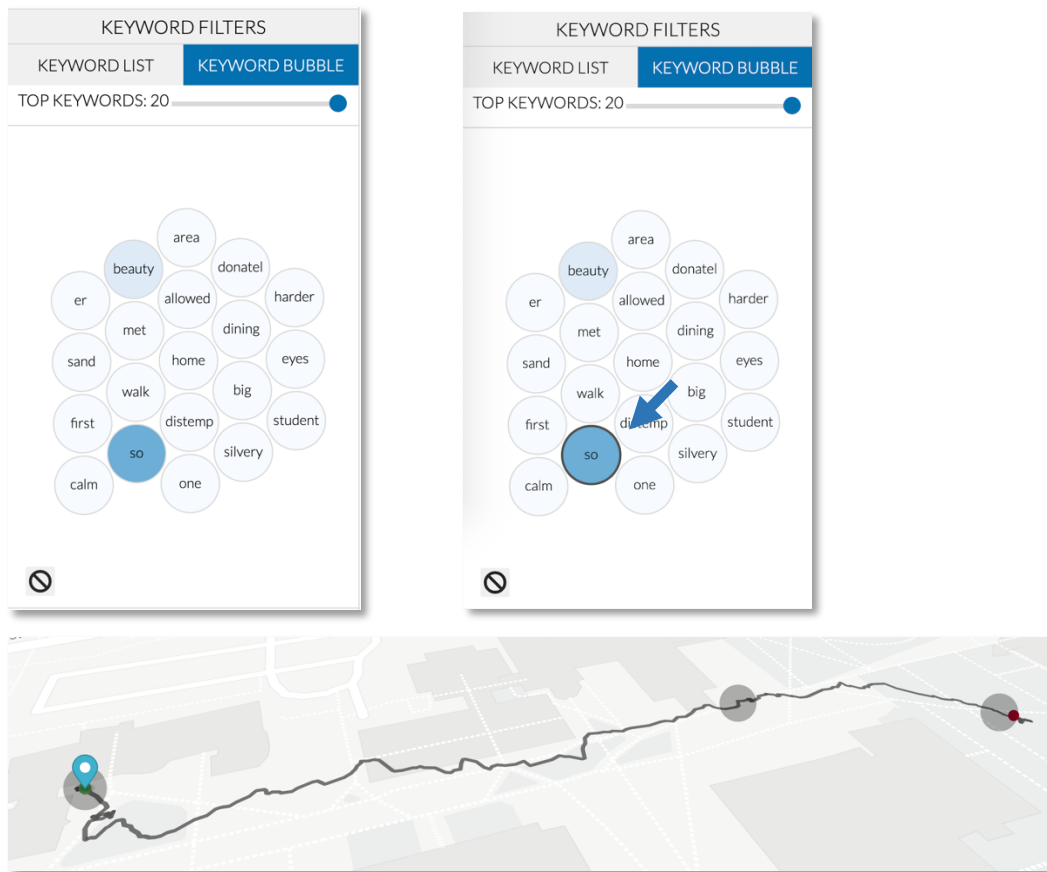
The keyword filters consist of Keyword list and Keyword bubble. Keyword list include top keywords sorted by frequency. User can also perform fuzzy search on any keywords to search any interested keyword.



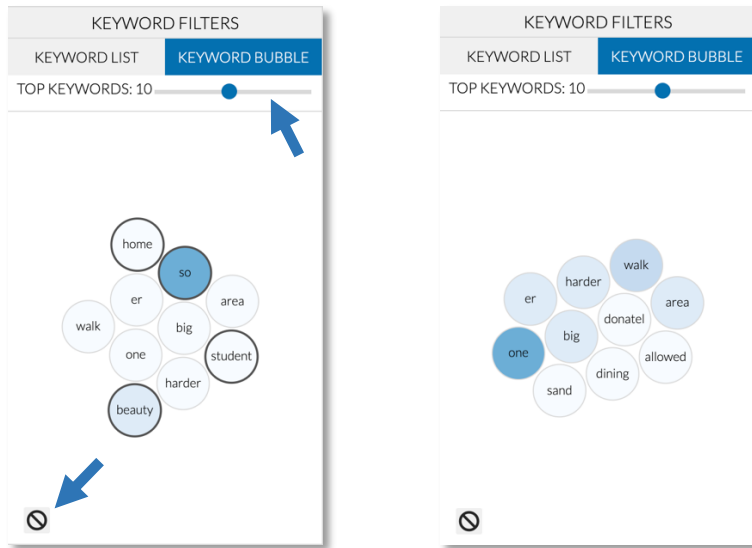
1. Mouse over each keyword will highlight trajectory with hovered keyword. For example, hover a word “Beauty” will show a blue circle over the Map View.



2. Select **Keyword Bubble** to show a bubble of keyword frequencies labeled by colors. Click on any keyword (e.g., “So”) will highlight a trajectory on the Map View.

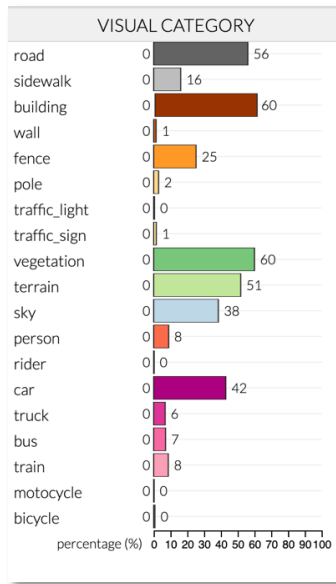


- User can adjust numbers of keyword bubbles by adjusting on the slider. In addition, user can also select any keywords and remove it by clicking on “∅” icon.

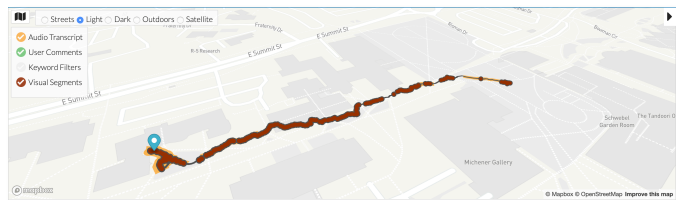
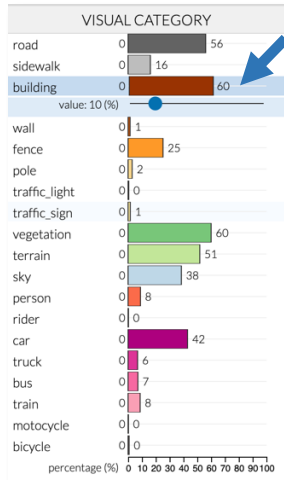


D. Visual Category

Once already process the video segmentation, user can click on VISUAL CATEGORY on the left panel. VISUAL CATEGORY provides a statistic of several visual category such as building, sidewalk, road, person, and etc.



1. Click on each category to filter specific category in term of percentages (%). For example, select “building” with above of 10 percentages (%). This will change the visual on the Map View.



2. User can also drag the slider to adjust percentages and drag the marker over the Map View to investigate the video contents and narratives.

TRIPS

Upload Date: [icon] [icon]

Trip (2020-05-16) [icon] [icon] [icon]

Trip ID: 20200516_025424
 UPLOAD ON: 2020-05-16
 RECORD AT: 2020-05-16
 LOCATION: Kent
 DESCRIPTION: Campus
 NOTES: none

100.00%

START VIDEO SEGMENTATION

100.00%

START AUDIO TRANSCRIPTION

Trip (2020-05-16) [icon] [icon] [icon]

KEYWORD FILTERS

VISUAL CATEGORY

Category	Percentage (%)
road	56
sidewalk	16
building	60
wall	1
fence	25
pole	2
traffic_light	0
traffic_sign	1
vegetation	60
terrain	51
sky	38
person	8
rider	0
car	42
truck	4
bus	7
train	8
motorcycle	0
bicycle	0

percentage (%) 0 10 20 30 40 50 60 70 80 90 100

COMMENTS

Play 2019-12-27 02:42:36

AUDIO TRANSCRIPT

cameron a rite the harder cunningham i think this was also designs being so most paradisa area is always about her since they so mutineer in committee and communities is an

E. Video Controls


The video controls provide a control bar where users can control their video clip such as play/pause, mute/unmute, or navigate to specific part of the video.



- User can click **Play** button to play the video.
- User can drag **slider bar** to navigate to specific part of the video clip.
- Click on **Volume** icon will mute/unmute sound of the video clip.

F. Video Narratives and Comments

After extract the narratives, user can see speech contents of the video. User can also give any comments on any specific part of the video clip.

1. Click on  icon to see the narrative contents in the list. User click to select speech and skip to specific part of the video that contain that narrative.

AUDIO TRANSCRIPT COMMENTS

so now we can walk allowed in the sand came so this is beauty donatello about it the you dining in distemper so the first one be eyes on our beauty so he met them at the calm silvery so here's a boding ah and this money is carterson home this beading

we going to go to the er i er toinette she did were good so we gonna walk allow it a bit and be just all i may often be

the beauty on the left he recalled as some home so all the vases and some engineering disparities you you see the toiling on the right never renselear so in and have the only i my bread is in the

User: user_3
Date: 2020-05-16 07:28:16
Comment: comment_3

cameron a rite the harder cunningham i think this was also designs being so most paradis area is always about her since they so mutineer in committee and communities is an

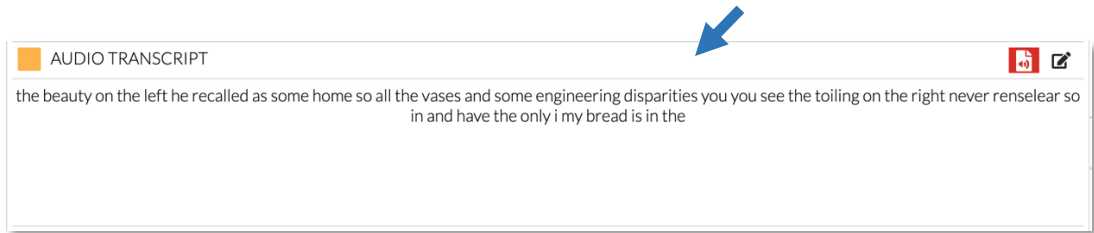
this one is the method and i are to be the miss belding the harder it is such beauty it is connected this with a so

Audio Transcript / Comments filters

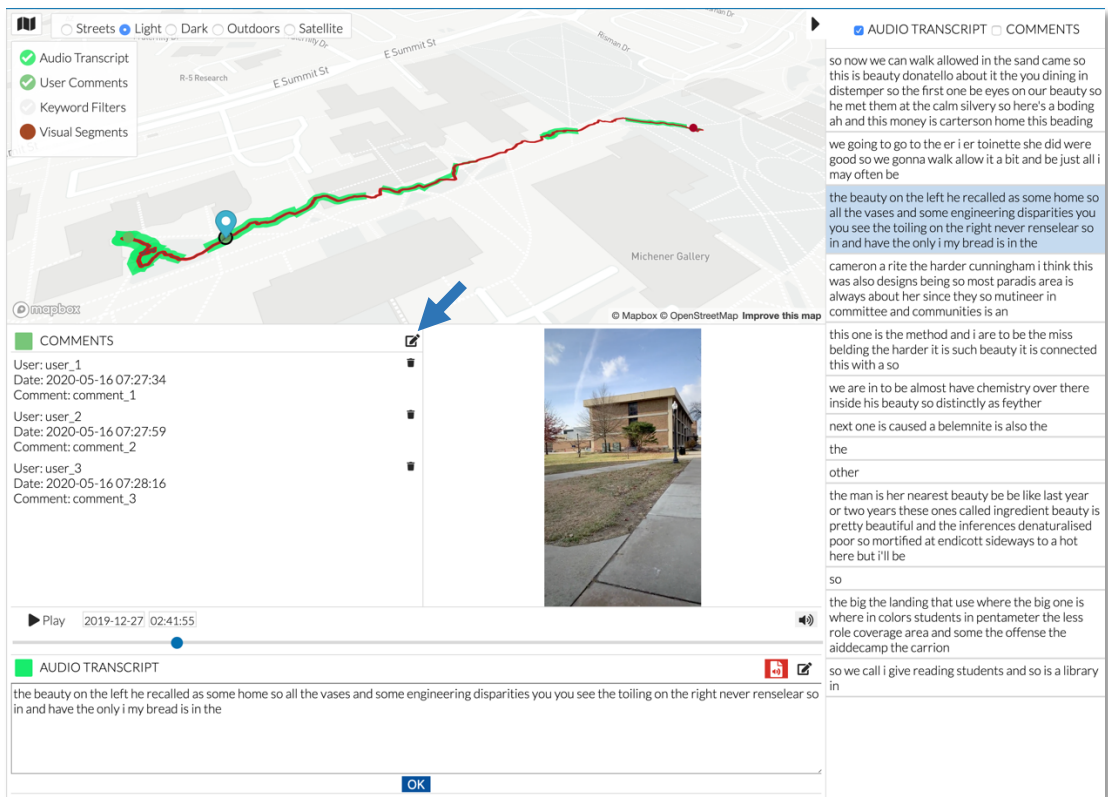
User Comments

Audio Transcript

2. Audio Transcript panel is located in the bottom. User can modify any audio transcript by clicking on the **Edit** button. User can also click on **Volume** icon, which will give a current speech voice for a clue.

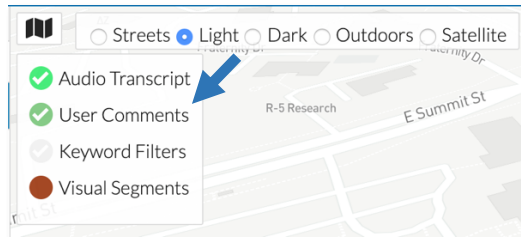


3. User can click on **COMMENTS** panel to add/ edit/ remove any comments of interest.

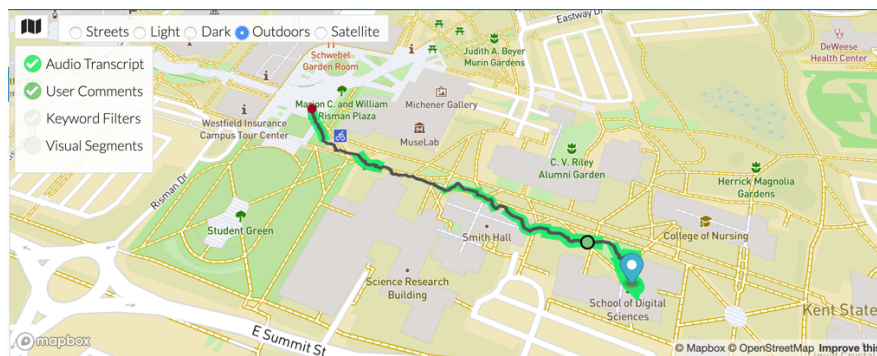


G. Map View and Styling

1. User can toggle any check marks to filter and highlight contents over the Map View.

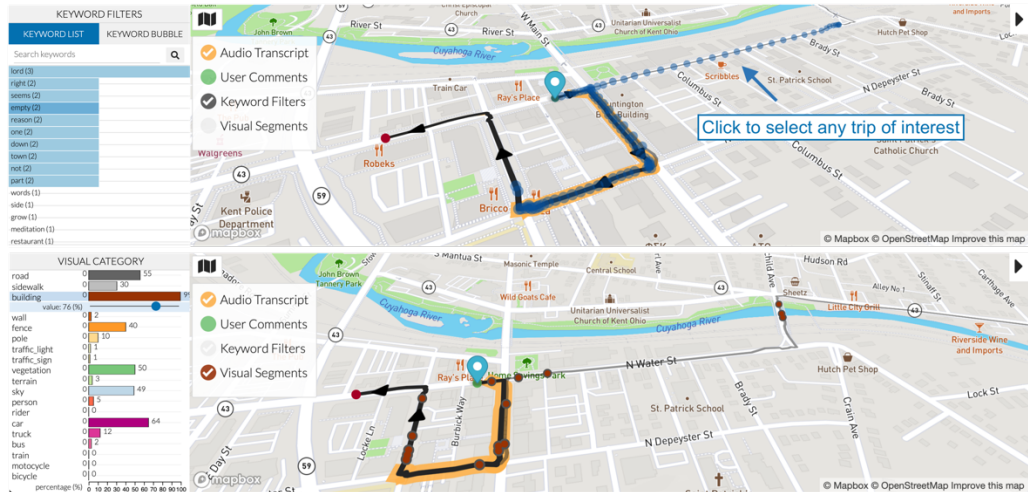


2. User can change Map Styles by clicking on Streets, Light, Dark, Outdoors, or Satellite Map themes.

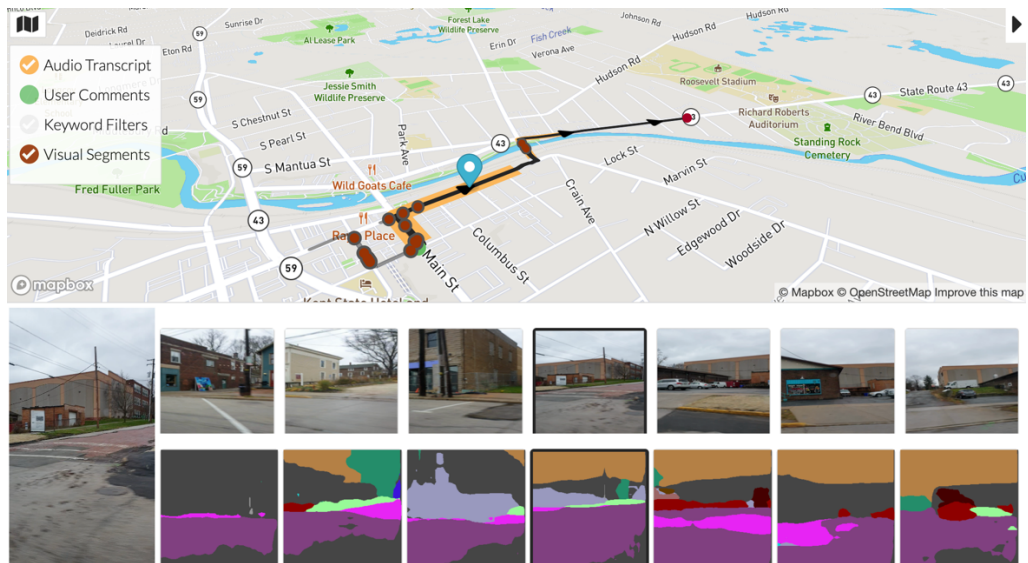


- Users can compare visual elements in both **KEYWORD FILTERS** and **VISUAL CATEGORY**, which visualized on the current trip and other trips. In addition, Users can click on any trip of interest over the map and select it to study for more details.

Comparison Example of visual elements in both **KEYWORD FILTERS** and **VISUAL CATEGORY**



Click to select the trip of interest.



DATA UPLOAD
AUDIO TRANSCRIPT / COMMENTS

The screenshot displays the VisualCommunity interface. At the top, there's a search bar and an 'UPLOAD' button. Below is a 'TRIPS' section with a map showing a route. A sidebar on the left contains trip details (Trip ID: 20200516_025424, Upload On: 2020-05-16, Record At: 2020-05-16, Location: Kent, Description: Campus, Notes: none) and progress indicators for 'START VIDEO SEGMENTATION' and 'START AUDIO TRANSCRIPTION', both at 100.00%. Below this is a 'KEYWORD FILTERS' section with a 'VISUAL CATEGORY' bar chart. The chart shows various categories with their respective counts: road (56), sidewalk (16), building (60), wall (1), fence (25), pole (2), traffic_light (0), traffic_sign (1), vegetation (60), tetrain (51), sky (38), person (8), rider (0), car (42), truck (6), bus (7), train (8), motorcycle (0), and bicycle (0). To the right of the map, there's a 'COMMENTS' section with three user comments and a video player showing a street scene. The video player has a play button and a timestamp of 2019-12-27 02:41:55. Below the video is an 'AUDIO TRANSCRIPT' section with a play button and a timestamp of 2019-12-27 02:41:55. The transcript text is: 'the beauty on the left he recalled as some home so all the vases and some engineering disparities you see the toiling on the right never renelear so in and have the only i my bread is in the'.

TRIP LIST
VISUAL CATEGORY
USER COMMENTS

MAP VIEW
VIDEO CONTENTS
AUDIO TRANSCRIPT

The 'KEYWORD LIST' section features a search bar and a list of keywords with their counts. The list is as follows:

- so (452)
- beauty (217)
- one (102)
- home (69)
- walk (59)
- area (54)
- big (52)
- harder (50)
- students (43)
- er (42)
- allowed (38)
- sand (38)
- donatello (38)
- dining (38)
- distemper (38)
- first (38)
- eyes (38)
- met (38)
- calm (38)
- silvery (38)
- here's (38)

The 'KEYWORD BUBBLE' section shows a bubble chart of top keywords. The chart is titled 'TOP KEYWORDS: 20'. The bubbles are arranged in a circular pattern, with 'so' being the largest and most central bubble. Other prominent bubbles include 'beauty', 'sand', 'silvery', 'er', 'dining', 'area', 'distemp', 'eyes', 'one', 'first', 'home', 'harder', 'met', 'walk', 'big', 'calm', 'student', and 'donatel'.

KEYWORD FILTERS

VISUALCOMMUNITY USER INTERFACE