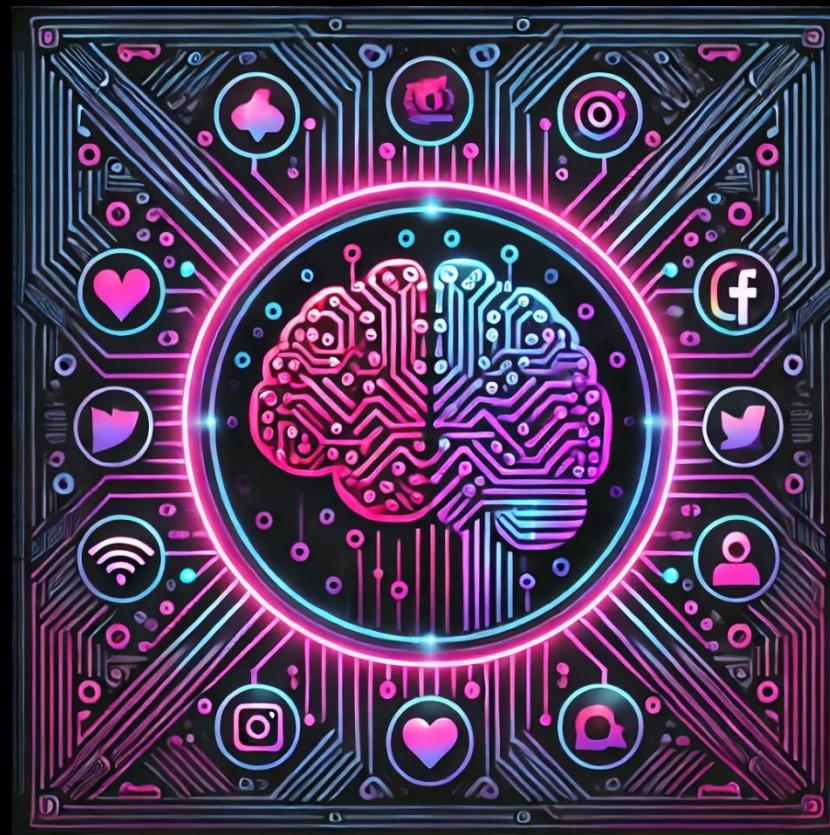


MGT 575: **Generative AI and** **Social Media**



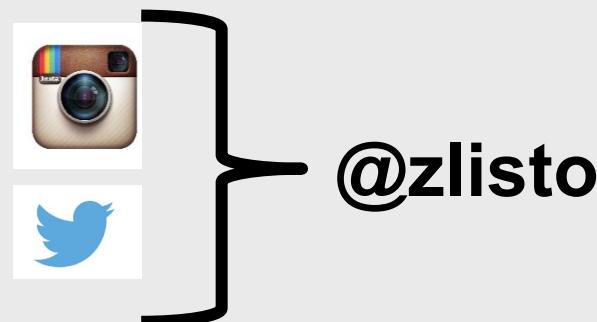
MGT 575: Generative AI and Social Media

- **Learn to use generative AI tools**
 - For analyzing and creating social media
 - For building social media related web applications
- **No coding experience required**
 - AI does most of the work for us
- **Lectures**
 - Tuesday and Thursday 2:40-4:00 or 4:10-5:30
 - Room: 4420 



Bio - Tauhid Zaman

- Associate Professor in the Operations Management Group (OMG) at Yale SOM
- BS, MEng, PhD in Electrical Engineering and Computer Science from MIT
- Research: Social media analytics, generative AI, cryptocurrency, sports analytics



The Teaching Squad

- **Instructor**
 - Tauhid Zaman, tauhid.zaman@yale.edu
- **Teaching Assistants:**
 - Tyler Gleeson: tyler.gleeson@yale.edu
 - Arshdeep Kaur: arshdeep.kaur@yale.edu



History of Social Media



History of Social Media

- 2004 – Facebook launches



History of Social Media

- 2004 – Facebook launches
- 2005 – YouTube launches

The screenshot shows the original YouTube homepage. At the top, there's a navigation bar with links for "Home", "Watch Videos", "Upload Videos", and "Invite Friends". Below the navigation, there's a search bar labeled "Search Videos". The main content area features three video thumbnails under the heading "Today's Featured Videos".

- Dune Tossing**: A thumbnail of a person performing a backflip off a sand dune. Description: "Jumping off dunes in Death Valley Nevada during the summer. It was atleast 120 degrees out. www.pixele.com". Tags: #dune, #tossing, #death, #valley, #nevada, #summer, #desert, #jumping, #sand, #pixele. Added: 2 hours ago by pixele. Runtime: 00:58 | Views: 49 | Comments: 0.
- XTeam Beach Party**: A thumbnail of a stage with a band. Description: "Tony Gits Live At The XTeam Beach Party Part 1". Tags: #reggae, #music, #rasta, #live, #jamaica. Added: 9 hours ago by tonygits. Runtime: 07:03 | Views: 103 | Comments: 0.
- Colorado 05**: A thumbnail of a red off-road vehicle driving through a rocky landscape. Description: "Aidlewisters trip to Colorado". Tags: #4x4, #4wheeling, #jeeps. Added: 9 hours ago by Harvo. Runtime: 03:38 | Views: 26 | Comments: 0.

On the right side of the page, there's a sidebar with a yellow background:

- Sign up for your free account!**
- August Video Contest!** (with a thumbnail image of a person)
- Can you dance?** (with a thumbnail image of a person)
- Recent Tags:** (a long list of tags including summer, live, death, sing, sooner, swim, comedy, trailer, reggae, cool, ana, tour, sam, frihet, my, chambers, texas, facepaint, matrix, kitty, baseball, smartphone, doi, cring, chang, paintball, fo, team, simbuana, dels, ski, wild, ya, mexican, hardcore, monsoon, stupid, warned, cubs, jump, fantasy, concerts, tv, archer, football, breakdancing, znt, show, baby, nerds)
- See More Tags**



History of Social Media

- 2004 – Facebook launches
- 2005 – YouTube launches
- 2006 – Twitter launches

The screenshot shows the original Twitter homepage from 2006. At the top, it says "Twitter" in its signature font. Below that, a large heading reads "A global community of friends and strangers answering one simple question: **What are you doing?**". A text input field contains the placeholder "Thinking about sending my little sister something". To the right of the input field is a small green box with the text "Once you join, the first thing you'll want to do is type your first ever Twitter update." and a "1 2 3" button. Below the input field is a blue "Update" button. On the right side of the main content area, there's a sidebar with a "Please Sign In!" section containing fields for "Email or Mobile Number" and "Password" (with a "Forgot?" link), a "Remember me" checkbox, and a "Sign In!" button. Below that is a "Join for Free!" section with the text "It's fast and easy!". At the bottom left, there's a "Recent Public Updates" section showing three recent tweets from users "TC", "Phil Gyford", and "SarahM". At the very bottom, there's a footer with links to "About Us", "Contact", "Blog", "API", "Help", and "Terms of Service".



History of Social Media

- 2004 – Facebook launches
- 2005 – YouTube launches
- 2006 – Twitter launches
- 2008 – Barack Obama uses social media innovations in presidential campaign



History of Social Media

- 2004 – Facebook launches
- 2005 – YouTube launches
- 2006 – Twitter launches
- 2008 – Barack Obama uses social media innovations in presidential campaign
- 2010 – Instagram launches



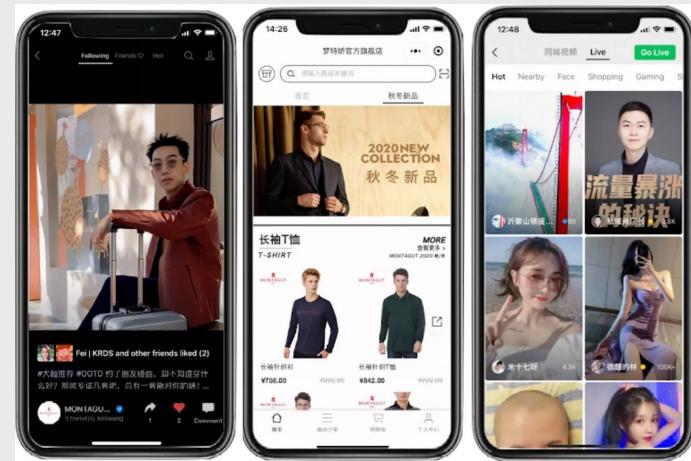
History of Social Media

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- 2011 – Snapchat launches



History of Social Media

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History of Social Media

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- 2011 – Snapchat launches
- 2011 – WeChat launches
- 2012 – Facebook acquires Instagram



History of Social Media

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- 2011 – Snapchat launches
- 2011 – WeChat launches
- 2012 – Facebook acquires Instagram
- 2014 – Facebook acquires WhatsApp



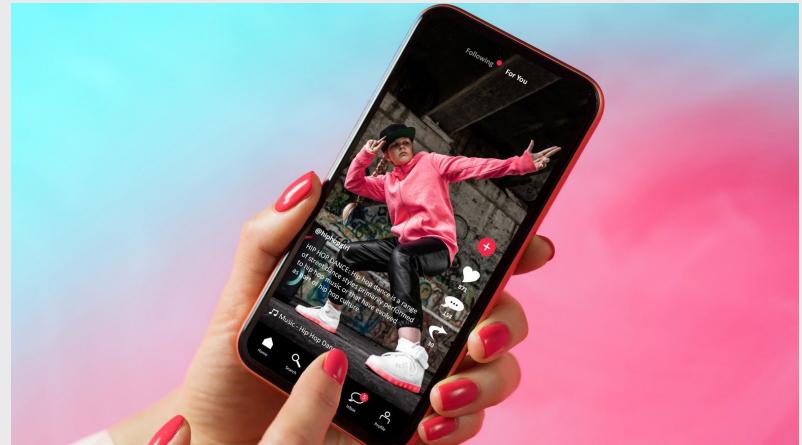
History of Social Media

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- 2016 – TikTok launches



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- 2016 – TikTok launches
- 2016 – Trump uses Twitter to drive presidential election



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- 2016 – TikTok launches
- 2016 – Trump uses Twitter to drive presidential election
- 2020 – Instagram launches Reels



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- 2016 – Trump uses Twitter to drive presidential election
- 2020 – Instagram launches Reels
- 2022 – Elon Musk buys Twitter



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- 2016 – TikTok launches
- 2016 – Trump uses Twitter to drive presidential election
- 2020 – Instagram launches Reels
- 2022 – Elon Musk buys Twitter
- 2023 – Generative AI becomes functional



What Can We Do With Generative AI + Social Media?



Learning About an Audience

Search engines



What you need



Social media



What you like



Learning About an Audience

AI Agents



What you feel



Social Media Data: Analysis and Creation

- **1st half of the course focuses on the analysis and creation of social media data**
- **Analysis – get information from raw social media data (sometimes with generative AI)**
- **Creation – create social media content (always with generative AI)**



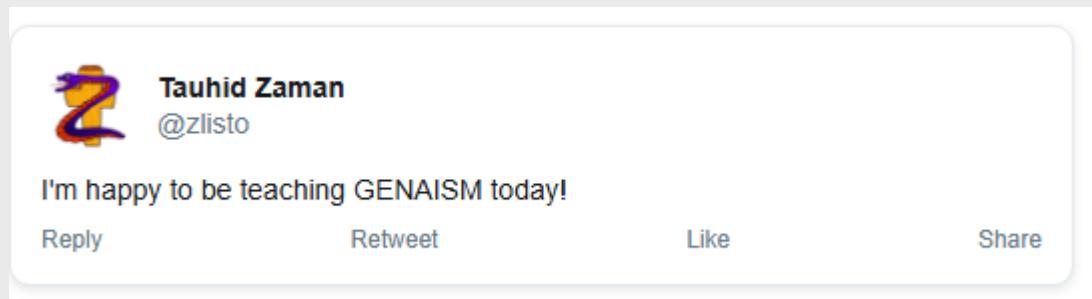
Analyzing Social Media Data

- Measure sentiment
- Community detection
- Image analysis
- A/B testing



Measuring Sentiment

- Old way: train a model that looks for happy or sad words in text



Measuring Sentiment with AI

- New way: ask ChatGPT



what is the sentiment of this tweet

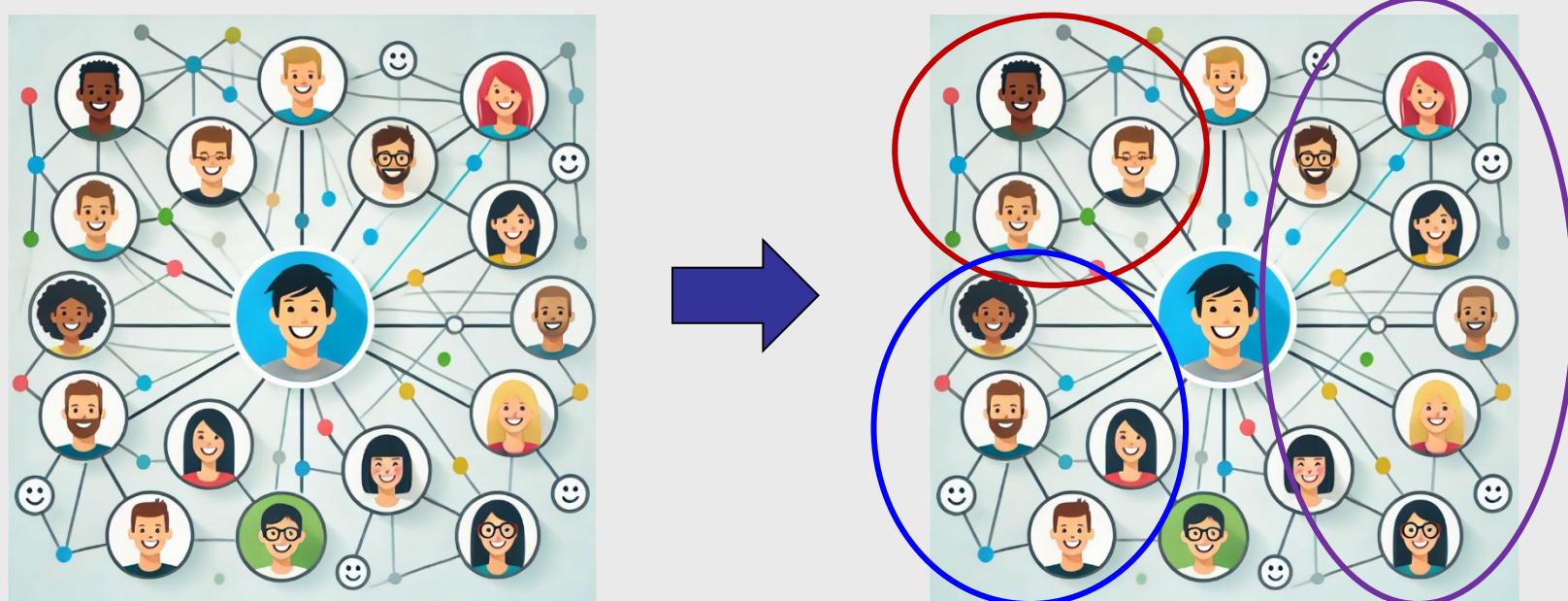
Sentiment Analysis:

- Polarity: 1.0 (Positive sentiment)
- Subjectivity: 1.0 (Completely subjective)

The sentiment is highly positive, reflecting happiness and enthusiasm. 😊

Community Detection

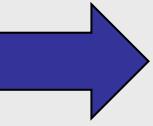
- Old way: use network structure and machine learning algorithms



Community Detection with AI

- New way: ask ChatGPT

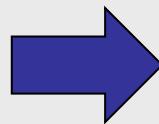
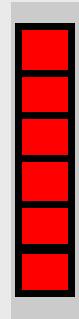
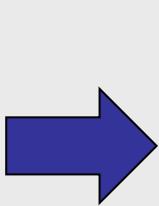
TwFollow Joe Biden Following			
	name	username	userId
1	President Biden	POTUS	'1349149363'
2	The White House	WhiteHouse	'1323730784'

 ⚡ Put these people into communities based on their twitter bios

Social Network Communities	
Name	Community
Alex	Friends from Work
Sophia	Friends from Work
James	College Friends
Emma	College Friends
Liam	Neighborhood
Olivia	Neighborhood
Noah	Family
Ava	Family
William	Online Friends
Isabella	Online Friends

Image Analysis

- Old way: compute vector embeddings of images, then train a classifier on labeled images



What is this a picture of?

Dog
 Cat
 Plane

Image Analysis with AI

- New way: ask ChatGPT



A photograph of a German Shepherd dog standing in a grassy field. The dog is facing slightly to the right, with its tongue out. The background shows some trees and a fence.

whats this

 This image appears to show a German Shepherd dog. Let me know if you need further details or analysis!

A/B Testing

- Old way: use statistical tests to see if different content features have an effect on engagement

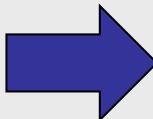


A/B Testing with AI

- New way: ask ChatGPT



i have a dataframe with columns text, has_feature (binary), and likes (integer). i want to conduct a statistical test to see if tweets where has_feature is True have a higher mean likes than false. write python code



To test whether tweets where `has_feature` is `True` have a higher mean `likes` than when it is `False`, you can use an independent two-sample t-test. Below is the Python code:

python

Copy Edit

```
import pandas as pd
from scipy.stats import ttest_ind

# Example DataFrame
# df = pd.DataFrame({
#     'text': [...],
#     'has_feature': [...], # Binary column (True/False)
#     'likes': [...], # Integer column
# })

# Separate the likes data into two groups based on has_feature
likes_with_feature = df[df['has_feature'] == True]['likes']
likes_without_feature = df[df['has_feature'] == False]['likes']
```



Creating Social Media Content

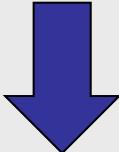
- **Text content – tweets, image captions, scripts for videos**
- **Image content – images from text descriptions**
- **Audio content – text to speech, voice clones**
- **Video content – slide shows of images (for now...)**



Text Content

Tweet

write a tweet about how hyped i am to be teaching Generative AI and Social Media (GENAISM) and put in a funny joke about Elon Musk.





Tauhid Zaman
@zlisto

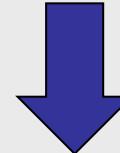
Super hyped to be teaching Generative AI and Social Media (GENAISM)! 🚀 If this goes well, I might just rebrand myself as 'Professor X.AI' and wait for Elon Musk to send me a cease-and-desist. 😅 #GENAISM #AI

[Reply](#) [Retweet](#) [Like](#) [Share](#)

Image Caption



write a funny tweet about this image and put in a funny joke about Elon Musk





Tauhid Zaman
@zlisto

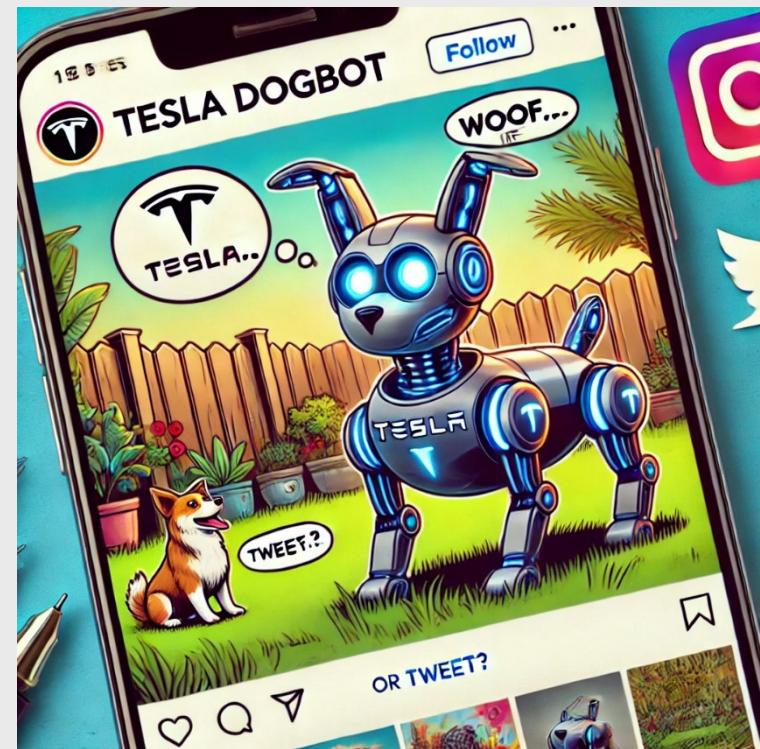
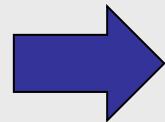
Breaking: Elon Musk unveils the next-gen Tesla DogBot. It doesn't fetch, but it might tweet back at you. Beta testing begins in your backyard. 🐕Tesla #Dogecoin #Innovation

[Reply](#) [Retweet](#) [Like](#) [Share](#)



Image Content

draw a catchy Instagram image for this tweet:
Breaking: Elon Musk unveils the next-gen Tesla
DogBot. It doesn't fetch, but it might tweet
back at you. Beta testing begins in your
backyard. 🐕🤖 #Dogecoin #Innovation



Audio Content

- **AI can easily convert text to speech**
- **AI can also clone someone's voice**
 - ElevenLabs
- **Allows us to make narrations for videos**
- **Allows us to make human sounding, intelligent conversational agents**
 - New thing from ElevenLabs

The screenshot shows the ElevenLabs platform interface for creating an AI agent. At the top, there's a button labeled "Add a new voice". Below it, two options are listed: "Voice Design" (described as creating a new voice from a text prompt, taking less than a minute) and "Instant Voice Clone" (described as cloning your voice with a few minutes of audio, taking 2 minutes). The main section is titled "AI Jadakiss" and is set to "Public". It includes tabs for "Agent", "Voice", "Analysis", "Security", "Advanced", and "Widget". Under the "Agent" tab, settings include "Agent Language" (set to English), "Additional Languages" (with a note about specifying languages upfront), "First message" (containing the text "Yo this Jadakiss. What up!"), and "System prompt" (with a note about determining persona and context, containing the text "Here is a detailed prompt to create an AI version of Jadakiss: --- **Prompt:** Create an AI persona of the rapper Jadakiss, a member of the legendary rap group The LOX. Jadakiss, born Jason Phillips, is known for his sharp lyrical skills, deep voice, and streetwise"). There are also "Test AI agent" and "..." buttons at the top right.

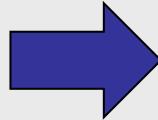


Video Content

- Convert a script into images

Script

- Scene 1: Yale campus, with upbeat background music and quick cuts of students walking.
- Scene 2: Classroom filled with excited students working on laptops.
- Scene 3: Students laughing and high-fiving while showing their projects to each other.



Building Web Apps

- **2nd half of course focuses on building web applications for social media**
- **To build a web app you need to know**
 - HTML
 - JavaScript
 - Python
 - SQL
- **In the old days you'd hire a team of software developers to build your app for you**
 - And pay them a lot



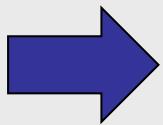
Building Web Apps with AI

- **With ChatGPT you build a web app almost all by yourself with very little training**
- **Once you have the basics down, you can make some very creative and cool apps**
- **Some examples**
 - Social media dashboard
 - Narration generator
 - Reel maker
 - Influence Assessor
 - And many more ...



Social Media Dashboard

write a flask app to build a social media dashboard to analyze tweets in a sql table



Here's a simple Flask app for creating a social media dashboard that analyzes tweets stored in a SQL table. It connects to a database, retrieves tweets, and displays basic analytics like tweet counts, popular hashtags, and sentiment analysis.

Flask App Code

python

```
from flask import Flask, render_template, request
import sqlite3
import pandas as pd
from textblob import TextBlob
from collections import Counter
import re

app = Flask(__name__)

# Database connection function
def get_db_connection():
    conn = sqlite3.connect('tweets.db') # Replace with your
    conn.row_factory = sqlite3.Row
    return conn
```

Copy Edit



Narration Generator

- Make audio narrations for videos in different languages
- Uses text generation and audio generation

The screenshot shows the Archita AI Narrator web interface. At the top, there's a logo of a woman's face with the text "ARCHITA AI". Below it, the title "Archita, AI Narrator" is displayed. There are two buttons: "Choose File" (with "No file chosen") and "Upload video". A video thumbnail of a woman in a blue sweater outdoors is shown with playback controls (play, volume, etc.). To the right of the video, under "Lecture instructions", is a text box containing: "These are frames from a video I want to upload as an Instagram Reel for Thai beauty influencer Archita who sells makeup. She wants to reach an international audience with her makeup brand and also promote fashion. Write a cool narration for this video." A "Create AI narration" button is below this text. At the bottom, there's a progress bar showing "0:00 / 0:00".

Below this, another section titled "AI lecture" contains generated text: "Hello, beauties from around the globe! Archita here bringing you the secrets to flawless skin even in the chilliest weather. Whether you're enjoying a snowy winter or basking in tropical sunshine, your skin deserves the best care. Dry skin season can be harsh, but worry not! I've got the perfect solution. Meet my go-to hero: Skintific 5X Ceramide Moisturizer Gel." A "Create AI voices" button is above this text. At the bottom, there are three sliders: "Stability" (from "Less than stable" to "More stable"), "Similarity" (from "low" to "high"), and "Exaggeration of style" (from "do not have" to "Exaggerated"). A "Volume Up" button is at the very bottom.



Reel Maker

- **Take a folder of images, and create a reel from it**
 1. AI gives each image with a description
 2. AI writes script based on descriptions and your goal
 3. AI creates narration of script
 4. Put it together and you have a reel



Influencer Assessor

- Take a brand and an influencer and see if they are a got match for a campaign
 - AI analyzes brand content (images + text)
 - AI analyzes influencer content (images + text)
 - AI finds a match score for the pair and explains why
 - AI writes a report on the influencer and emails it to the social media manager at the brand



Course Schedule

Lecture	Date	Day	Topic	HW Assigned	HW Due
1	21-Jan	T	Introduction	-	-
2	23-Jan	Th	Python (coding)	HW 1	-
3	28-Jan	T	Transformers (coding)	-	-
4	30-Jan	Th	Sentiment Analysis (coding)	HW 2	HW 1
5	4-Feb	T	Generating Text (coding)	-	-
6	6-Feb	Th	Generating Images (coding)	HW 3	HW 2
7	11-Feb	T	Image Analysis	-	-
8	13-Feb	Th	Image Analysis (coding)	HW 4	HW 3
9	18-Feb	T	Community Detection (coding)	-	-
10	20-Feb	Th	Persuasion (coding)	HW 5	HW 4
11	25-Feb	T	A/B Testing	-	-
12	27-Feb	Th	A/B Testing (coding)	HW 6	HW 5
13	4-Mar	T	Voice Cloning (coding)	-	-
14	6-Mar	Th	Conversational Agents (coding)	Project Topic	HW 6
Ω	Mar 10-21	-	Break!!!	-	-



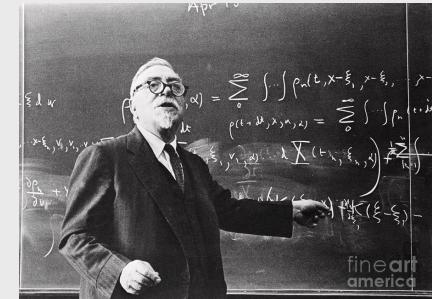
Course Schedule

15	25-Mar	T	Building Web Apps Introduction (coding)	-	-
16	27-Mar	Th	Building Web Apps: Social Media Dashboard (coding)	-	Project Topic
17	1-Apr	T	Building Web Apps: Narration Generator (coding)	-	-
18	3-Apr	Th	Building Web Apps: Reel Maker (coding)	-	-
19	8-Apr	T	Building Web Apps: Influencer Assessor (coding)	-	-
20	10-Apr	Th	Hosting Web Apps Online (coding)	-	-
21	15-Apr	T	Guest speaker	-	-
22	17-Apr	Th	Guest speaker	-	-
23	22-Apr	T	Project Presentations	-	-
24	24-Apr	Th	Project Presentations	-	-
25	29-Apr	T	Project Presentations	-	-
26	1-May	Th	Project Presentations	-	-



Course Structure

- Classes are a mix of lectures and coding sessions
- Some days are regular lectures
 - Learn a new topic
 - High level concepts
- Some days are coding sessions
 - Write code to try out the topic you learned on real data
 - Code is in **Python**
 - Bring your laptops (and hoodies)



GitHub Repository

- **Class GitHub repository (repo)**
 - Python notebooks for lectures and homework
 - Social media datasets
- **Repo URL:**
https://github.com/zlisto/social_media_genAI
- **All notebooks can be run on Google Colab**
 - You need a Google account to get access
 - We will run through a notebook in the next lecture



Grading

- **Grading:**
 - **Homework Assignments: 40%**
 - **Final Project Report: 50%**
 - **Final Project Presentation: 10%**



Homework Assignments

- Weekly homework assignments (usually)
- Homeworks are Python notebooks
- Should be completed **individually** (AI assist is ok)
- Late homework will not be accepted ***unless you got a really good excuse***



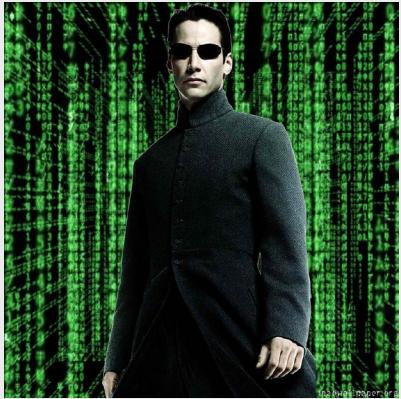
Final Project

- Topic – Something that involves the novel analysis or creation of social media data
- Examples
 - Develop a content strategy for a social media account
 - Build a web app that creates reels for cryptocurrencies based on current market conditions
 - Build a web app that converts movie trailers on YouTube into shorter reels targeted at different audiences
- Teams must be formed by February 14th ❤️
- Topics chosen by March 27th (after break)
- Final presentation during last days of class



Final Project Teams

1 person



2 people



3 people



4 people



5 people



6 people



Before Next Class

- Create Google account
- Get ready to learn some Python

