⑤ ChatGPT

Tools for Predicting Short-Form Video Virality

Open Source Models and Frameworks

- **TikTok Virality Predictor (GitHub)** – An open-source deep learning project that takes TikTok videos (with their audio and text) as input and predicts a **virality score** [1] . It defines *virality* as a weighted combination of engagement metrics (views, likes, comments, shares) and trains multi-modal models (vision, audio, and NLP) on a TikTok dataset [2] . Developers can run this locally (Python/PyTorch) using the provided code and even fine-tune on their own data. *License:* Not explicitly stated (public GitHub; likely permissive).

- **Tube Virality (YouTube Trending Predictor)** – An MIT-licensed Python project that gathers YouTube trending video data and builds models to estimate a video's viral potential [3] [4] . It analyzes historical **engagement patterns** (views vs. channel size, velocity of view growth, engagement rate, etc.) and identifies content features correlated with virality. While it relies on posted video stats (via the YouTube API), its machine learning pipeline can be adapted for pre-publication analysis by simulating those metrics. *Key features:* trending data collection across regions, virality pattern mining, and open-source ML models for popularity classification [5] .

- **Content Virality Score Analyzer (AnotherWrapper)** – A no-code AI app template that demonstrates how to use a **vision-language model** to evaluate an uploaded video and predict its viral potential [6] . Users upload a video and select a category, then an AI (via OpenAI's API) "watches" the video (using GPT-4 Vision or similar) and returns a **virality score** with textual suggestions for improvement [6] . This is essentially an open implementation of a virality predictor using a general AI model. *Key features:* runs locally or on the web via Next.js; leverages GPT-4's multimodal capabilities; requires an OpenAI API key. (Note: This approach uses a general AI rather than a pre-trained specialized model, but it's open-source and customizable.)

Commercial APIs and Platforms

- **Quso.ai – AI Virality Score** – A commercial cloud service (formerly vidyo.ai) that lets creators analyze a short video *before* posting. You upload an MP4 (TikTok, Reel, or YouTube Short), and Quso's AI returns a **Virality Score** along with feedback on what to tweak [7] [8] . The system uses computer vision and audio analysis to evaluate visuals, sound design, pacing, and even trends (hashtags or audios) in the clip. It then **predicts engagement potential** (e.g. likelihood of high reach or interaction) and highlights elements that could be optimized [9] [10] . This tool is offered via a web platform (with real-time analysis) – integration is typically through their API or dashboard. *Pricing:* Subscription-based (free trial available; exact plans on request) – suitable for content teams and marketers.

- **StreamLadder ClipGPT – AI Virality Score** – A feature in the StreamLadder platform aimed at live-streamers repurposing content. It can ingest a clip (by URL or upload) and output a **viral potential score** indicating how well that video might perform on TikTok, Instagram Reels, or YouTube Shorts [11] [12] . The analysis considers platform-specific factors (e.g. recommended aspect ratios, hook in first seconds, etc.) and gives creators insight into which segments of a stream are most likely to trend. After processing, creators see a score (e.g. "High/Medium/Low"

potential or a numeric rating) and can prioritize the highest-scoring clips for posting [12] [13] . *Integration:* Web interface with a **free tier** (limited clips per month) and paid plans for higher volume. This is not a standalone API, but it's a ready-to-use tool for individual creators.

• **BigMotion AI Platform** – Primarily known for AI video generation, BigMotion also alludes to **viral prediction** capabilities. In their AI glossary they define *"AI-driven viral video prediction"* as analyzing *current trends, keywords, and past content performance* to forecast a video's viral potential [14] . While not an explicit standalone product, this suggests BigMotion's toolkit (or similar marketing AI platforms) can evaluate a given video against trend data. Such platforms often integrate with content workflows to score your video or ad creative before release. *Pricing:* Typically commercial (software-as-a-service); details depend on suite or enterprise package.

Note: Traditional social video analytics tools (e.g. vidIQ or TubeBuddy for YouTube) offer *post-publication* insights and trend alerts. However, the ones above focus on **pre-publication content analysis** – either via cloud APIs or local tools – to predict virality from the video's intrinsic features. Commercial APIs generally require a subscription or pay-per-use, but they provide more polished integrations and often real-time scoring.

Academic Models and Research

• **TikTok Virality Indicators (2022)** – Researchers have studied what makes TikTok videos go viral, informing model design. One study analyzed hundreds of TikToks and found that besides a creator's follower count, specific content features correlated with virality – e.g. using close-up or medium camera shots, on-screen text, certain POV styles, and a longer *lifespan* of the video on the platform [15] . These findings suggest that machine learning models should incorporate both **creator context** (author popularity) and **visual/style features** of the video when predicting short-form engagement.

• **AMPS Multi-modal Model (2024)** – Cho *et al.* proposed **AMPS** (Attention-based Multi-modal Popularity Predictor for Short Videos) for YouTube Shorts [16] . It processes complete video frames (visual content of sub-60s videos) and audio/text metadata through a BiLSTM with self-attention and co-attention across modalities. By learning the interplay between visual sequences and other features, AMPS significantly improved popularity prediction accuracy over baseline methods [16] . The authors introduced a new short-video dataset and reported higher F1-scores and G-Means than traditional regression models. *(Implementation:* Although proprietary, the approach could be reimplemented with open frameworks; the paper is in *Journal of Retailing and Consumer Services, 2024*.)*

• **LLM-Based Popularity Prediction (2024–25)** – A novel approach treats popularity prediction as a **textual reasoning** problem. Kayal *et al.* (ACL 2025 Findings) showed that large language models can predict video virality by first converting video content into text descriptions using a vision-language model, then prompting an LLM (like GPT) with those descriptions [17] [18] . Without any task-specific training, the LLM achieved ~82% accuracy in classifying which videos would be "popular" vs "unpopular", slightly beating a specialized neural network, and up to **85.5%** accuracy when ensemble with the network's prediction [19] . This approach also yields **explanations** (the LLM can articulate why a video might trend, based on its content) [19] . While still academic, it suggests developers could leverage off-the-shelf APIs (for image captioning and GPT-4) to gauge virality in an interpretable way.

- **Multi-Modal Feature Ensemble Models** – Recent research emphasizes combining visual, audio, textual, and metadata features. For example, an *INFORMS 2024 Data Challenge* solution extracted deep video features with pretrained classifiers, generated detailed captions for each video via a video-to-text model (then encoded with BERT), and engineered metadata features (e.g. hashtag counts, video duration, upload time) [20] [21]. Separate predictors for each engagement metric (views, likes, comments, shares) were trained and then averaged (an ensemble of a neural network and an XGBoost model) to produce a final popularity prediction [21]. This hybrid approach (deep learning + gradient boosting) improved robustness when little historical data is available. It demonstrates the kind of **feature fusion** that pre-publication prediction benefits from.

- **MVP: Multimodal Video Predictor (2025)** – The winning solution of the *2025 Social Media Prediction Challenge* encapsulates state-of-the-art techniques. MVP integrated **pre-trained vision models** (to get latent video features) with **user/context features** (e.g. uploader info, temporal context) to build a rich representation [22]. It then used a **gradient-boosted regression** (a LightGBM/XGBoost variant) to capture complex patterns across these modalities. This approach achieved top accuracy on short-video popularity prediction and the authors made their code publicly available [23], providing a reference implementation for developers. The model's success underscores the importance of combining content signals with contextual data.

Key Takeaways: Predicting a clip's virality **before** it's posted is an active area of development. Open-source projects and academic models show that a combination of visual analysis, audio features, textual context (captions or detected keywords), and platform trends can yield a credible "virality score." Tools like Quso and StreamLadder have started packaging these insights into creator-friendly software, often via cloud APIs, so content creators can get an **engagement prediction** (and optimization tips) for an MP4 video in their workflow. Open-source and research implementations are available for those who wish to integrate such **predictive analytics** offline or customize the models. As the research suggests, the most effective solutions use **multi-modal AI** – analyzing everything from the video's imagery and sound to its meta-data and trend alignment – to forecast audience reach or engagement potential [9] [24].

Sources: Open-source project docs and code [1] [4]; product pages for Quso.ai and StreamLadder [25] [12]; and recent research literature on video popularity prediction [15] [18]. Each of the above tools/ models includes links to official pages or papers for further details and implementation/pricing information.

[1] [2] GitHub - juanls1/TikTok-Virality-Predictor: Deep Learning in TikTok to deploy a Virality Predictor
https://github.com/juanls1/TikTok-Virality-Predictor

[3] [4] [5] GitHub - gpsyrou/tube-virality: The YouTube Virality project collects and analyzes trending video data from multiple countries using the YouTube API. It aims to gather metrics like view counts, likes, and descriptions, then apply data science techniques to predict a video's likelihood of going viral.
https://github.com/gpsyrou/tube-virality

[6] Content Virality Score Analyzer | AnotherWrapper
https://anotherwrapper.com/tools/ai-app-generator/content-virality-score-analyzer

[7] [8] [9] [10] [25] AI Virality Score for Shorts, Reels and TikToks by quso.ai
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[11] [12] [13] AI Virality Score | StreamLadder
https://streamladder.com/clipgpt-features/ai-virality-score

[14] What is AI-driven viral video prediction: Definition & Meaning | AI Terms Glossary
https://www.bigmotion.ai/ai-terms-glossary/ai-driven-viral-video-prediction

[15] [2111.02452] Slapping Cats, Bopping Heads, and Oreo Shakes: Understanding Indicators of Virality in TikTok Short Videos
https://arxiv.org/abs/2111.02452

[16] AMPS: Predicting popularity of short-form videos using multi-modal attention mechanisms in social media marketing environments
https://ideas.repec.org/a/eee/joreco/v78y2024ics0969698924000742.html

[17] [18] [19] Large Language Models Are Natural Video Popularity Predictors | OpenReview
https://openreview.net/forum?id=iKsTtpzBtc

[20] [21] [2501.01422] Multi-Modal Video Feature Extraction for Popularity Prediction
https://arxiv.org/abs/2501.01422

[22] [23] [2507.00950] MVP: Winning Solution to SMP Challenge 2025 Video Track
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[24] Video Popularity Prediction and Analysis | Nature Research Intelligence
https://www.nature.com/research-intelligence/nri-topic-summaries/video-popularity-prediction-and-analysis-micro-75047