MindScope

A SENTIMENT ANALYSIS DASHBOARD FOR MENTAL HEALTH DISCUSSIONS ON SOCIAL MEDIA

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Agenda

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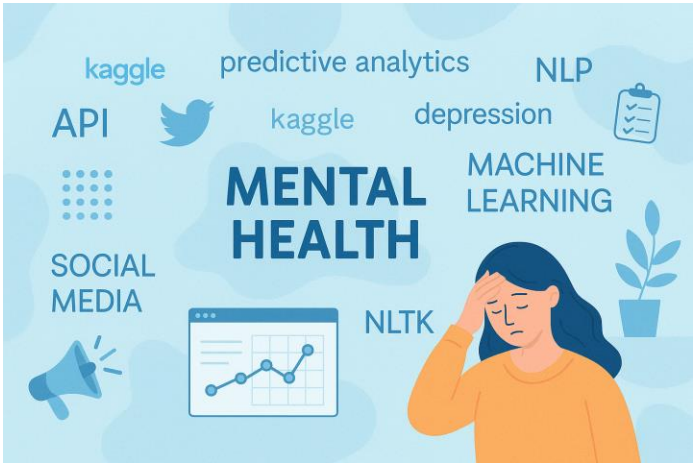
Introduction to MindScope



- MindScope is a transformative dashboard that utilizes sentiment analysis to decode the emotional tone of mental health conversations online.
- Social media has become a global outlet for mental health expression—MindScope taps into this stream to provide structured, insightful data.
- The dashboard empowers stakeholders with data-backed evidence to drive awareness, empathy, and targeted support.

Project Goals and Objectives

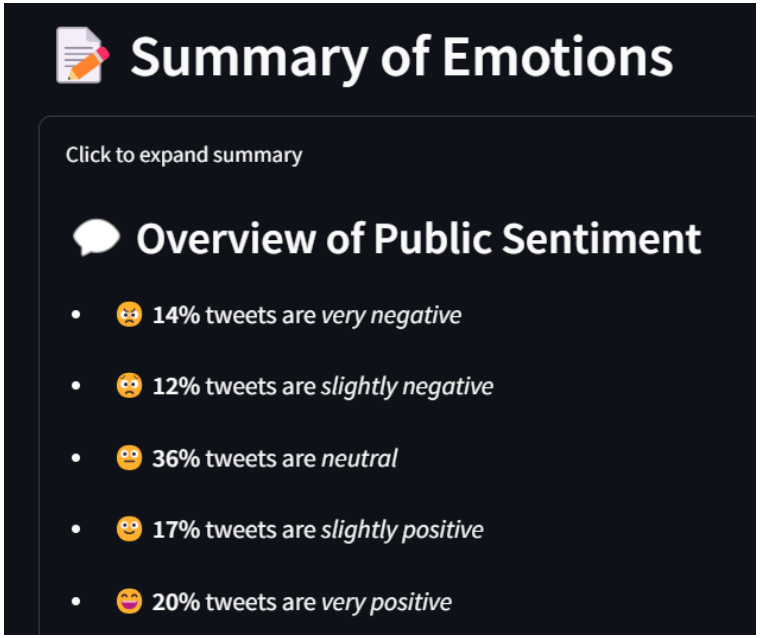
- Build an **interactive, real-time dashboard** for sentiment monitoring on mental health topics.
- Deliver **multi-dimensional analysis** of both live and historical data.
- Enables **data-driven decision making** for policy makers, researchers and community leaders.

Motivation Behind the Project

- Mental health crises are escalating, yet response mechanisms remain reactive rather than proactive
- MindScope offers an **early warning system** using real-time insights from social discourse.
- By visualizing trends and sentiments, we help shape a more **empathetic and informed society**.

Understanding Sentiment Analysis

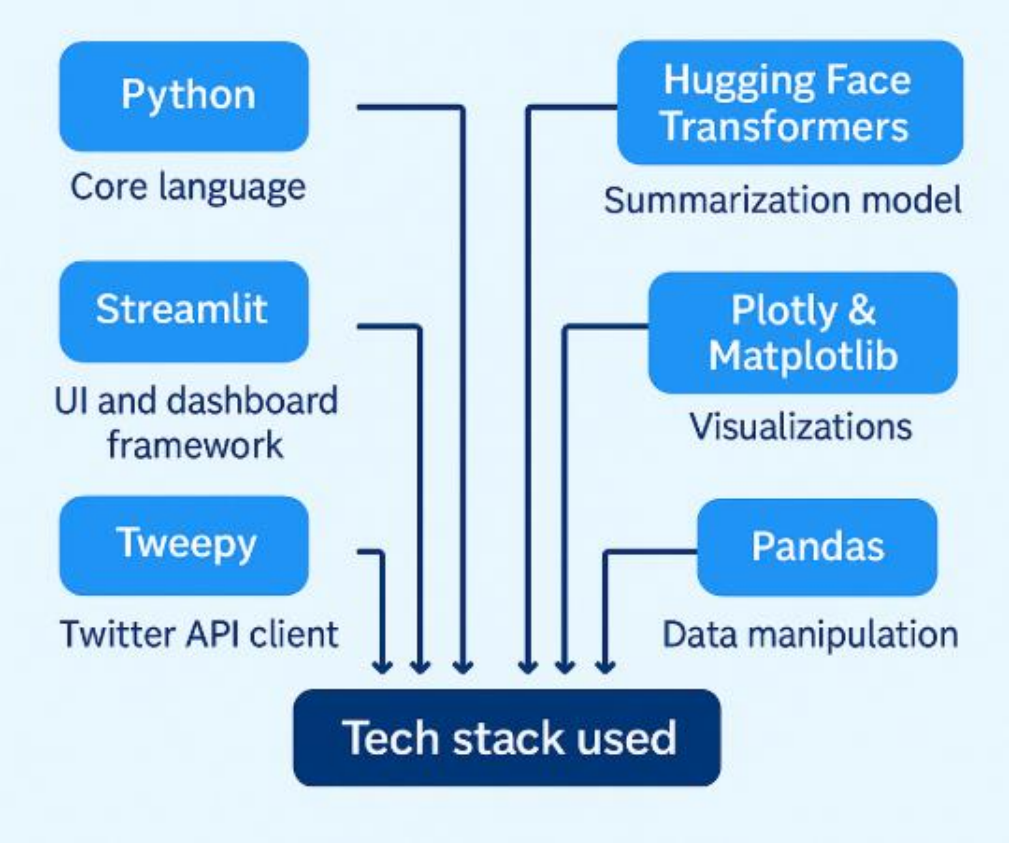
- **Sentiment Analysis** captures opinions and emotional tones in text using computational linguistics.
- MindScope enhances traditional techniques with **machine learning and NLP** to ensure high-fidelity results.
- The results illuminate mental health narratives and improve engagement with affected communities.



Data Sources and Methodology

- **Data Streams**: Real-time Twitter API and verified Kaggle datasets.
- **Methodology**: Data cleaning, NLP tagging, sentiment scoring, trend analysis.
- Combines qualitative signals with quantitative metrics to maximize insight richness.

Technology Stack Used

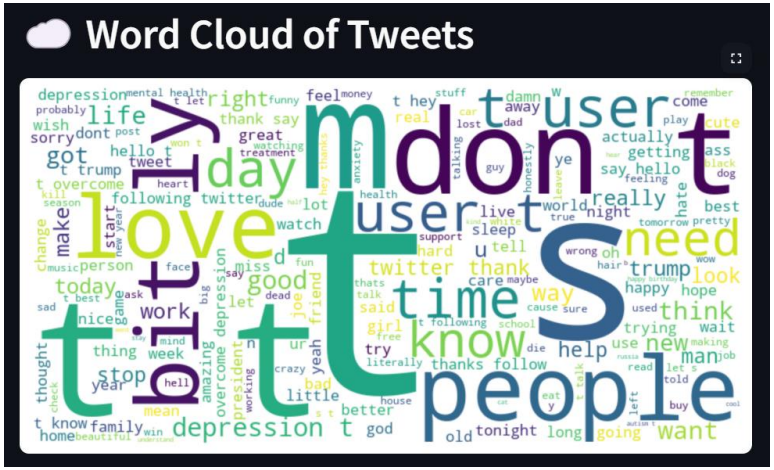


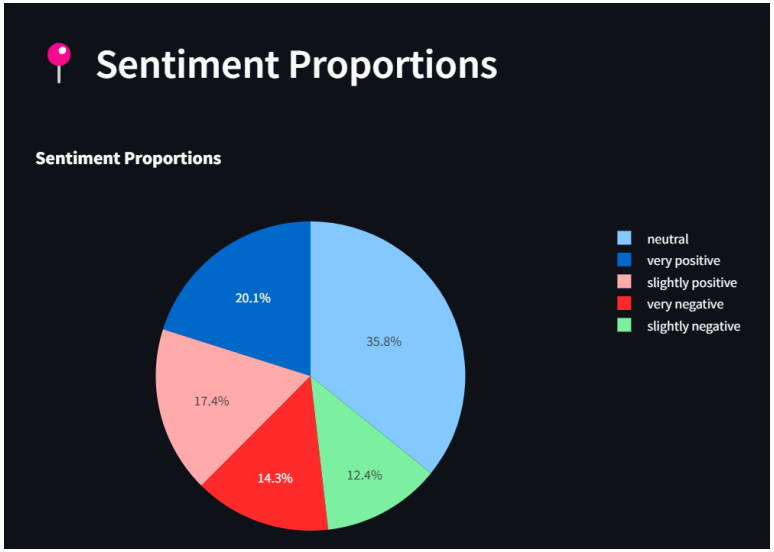
Advanced Features & Functionality

- **Flexible Data Source**: Toggle between live tweets (via Twitter API) and a curated Kaggle dataset
- **Smart Sentiment Filters**: Classify tweets as very/slightly positive/negative or neutral using NLP
- **Keyword Explorer & Word Clouds**: Explore emotions tied to key hashtags or words.
- **Rich Visualizations:**
  - Sentiment Distribution
  - Sentiment Over Time & Volume Forecast
  - Average Tweet Length & Tweet Count by Users
- **Advanced Analysis Tools**:
  - Hashtag Co-occurrence Network
  - Correlation Heatmap of tweet properties
  - Compare Two Hashtags Over Time
  - Emotion Distribution and User Behavior Profiles

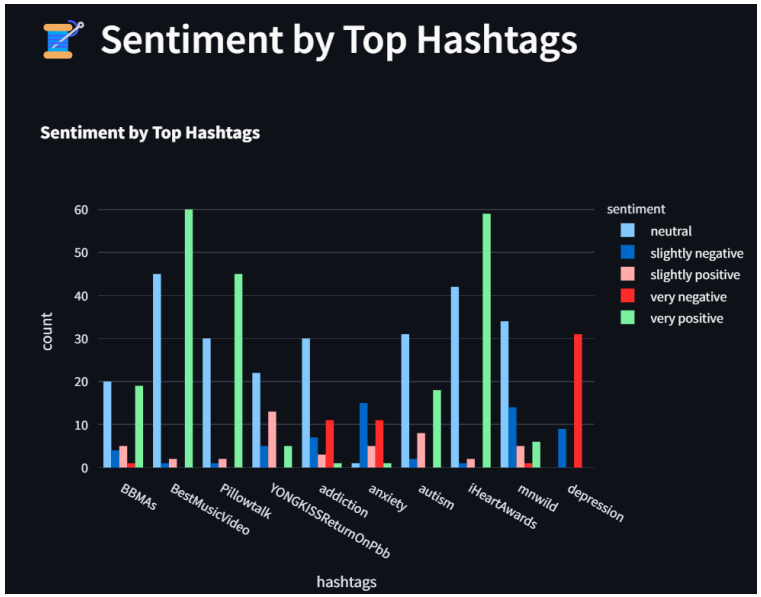
Real-world Applications

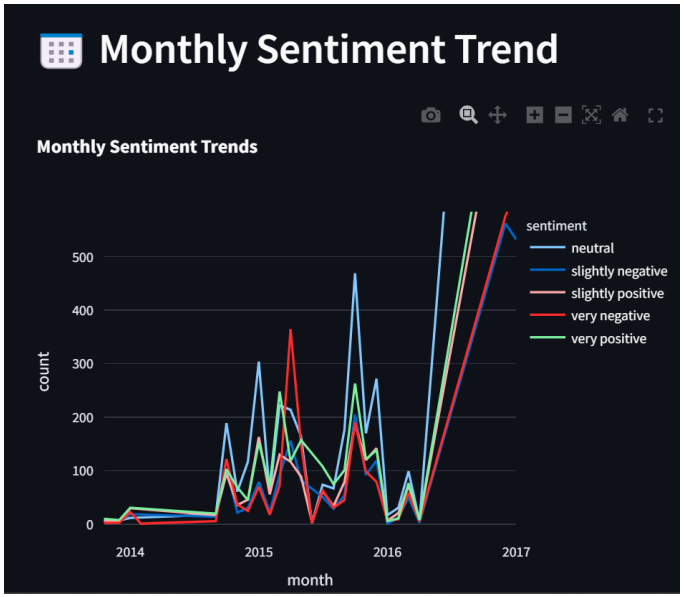
- **Policy Makers**: Visualize how public sentiment shifts around elections, legislation, or social events (e.g., COVID-19, Super Bowl).
- **Crisis Detection Systems**: Use live sentiment & keyword spikes to identify high-risk tweets for timely intervention.
- **Research & Academia**: Extract behavioral patterns and language trends for large-scale sociolinguistic studies.
- **Mental Health NGOs**: Customize outreach strategies based on real-time emotion feedback from different regions or demographics.
- **Forecasting**: Leverage the dashboard's trend forecasting to prepare for emotional spikes tied to known calendar events.





Why MindScope Matters





- Most digital health tools are reactive. **MindScope is proactive**.
- Captures emotional pulse of the internet in real time.
- Goes beyond numbers to uncover the **human voice behind tweets**.
- Bridges the gap between data science and community wellness.
- A step toward an empathetic, data-informed mental health future.

Visualization Techniques & Design Principles

Techniques Used:

- **Word Clouds** – highlight key topics and emotional expressions.
- **Time-Series Line Charts** – track sentiment and tweet volume trends.
- **Bar \& Pie Charts** – breakdown of sentiment polarity and tweet types.
- **Heatmaps** – correlation between tweet metadata (length, hashtags).
- **Network Graphs** – co-occurrence analysis for hashtags and keywords

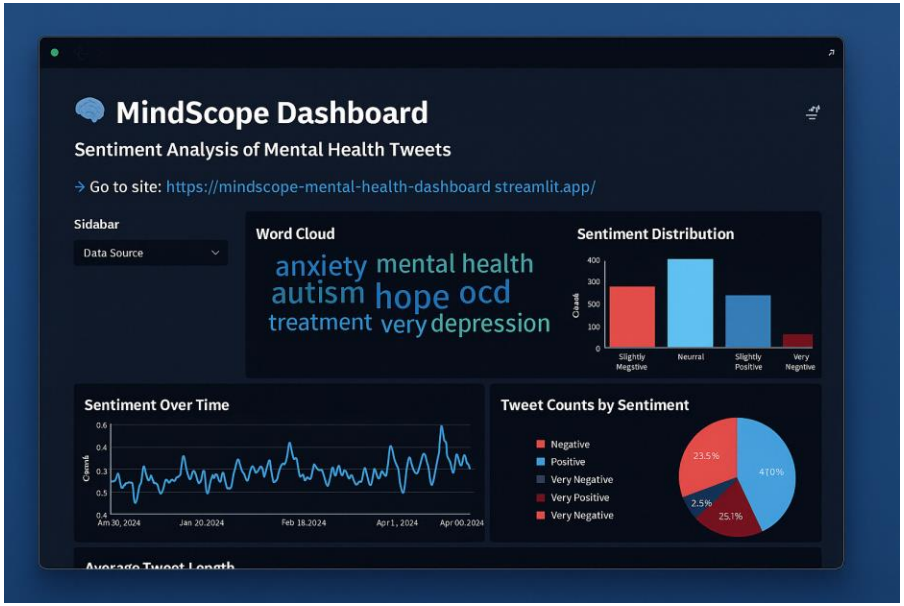
Design Principles Inspired by Edward Tufte:

- **High Data-Ink Ratio:** Visuals focus on data, removing unnecessary gridlines, clutter, and decoration.
- **Avoid Chartjunk**: Minimalist layout to maximize cognitive clarity.
- **Consistent Color Semantics**: E.g., red = negative, green = positive.
- **Dark Mode \& Accessible Fonts:** Improves contrast and readability.
- **Interactivity Over Density:** Hover-based detail-on-demand ensures depth without clutter.

Demo of MindScope Dashboard

Try it live at:

MindScope Dashboard



Challenges and Use Cases

Use Cases of MindScope

- Detect how emotional sentiment changes during major events like elections or the Super Bowl.
- Analyze historical data alongside real-time feeds to identify emerging mental health trends.
- Enable researchers and institutions to monitor spikes in stress, anxiety, or positivity around specific moments.

Challenge: Twitter API Limitations

- Restricted to retrieving only 100 tweets per request, requiring efficient sampling and fallback strategies

Conclusion & Future Directions

- MindScope is not just a dashboard—it's a **public health intelligence platform**.
- Future versions will incorporate AI-based **predictive analytics** and support for voice/text hybrid data.
- The project invites collaboration from the entire mental health ecosystem to bring about **timely, targeted, and impactful change**.

Thank You!

Questions?