# MoodViews: Tools for Blog Mood Analysis

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## Abstract

We demonstrate a system for tracking and analyzing moods of bloggers worldwide, as reflected in the largest blogging community, LiveJournal. Our system collects thousands of blog posts every hour, performs various analyses on the posts and presents the results graphically.

## Exploring the Blogspace

From the point of view of information access, the blogspace offers many natural opportunities beyond traditional search facilities, such as trend detection, topic tracking, link tracking, feed generation, etc. But there is more. Many blog authoring environments allow bloggers to tag their entries with highly individual (and personal) features. Users of LiveJournal, currently the largest weblog community, have the option of reporting their *mood* at the time of the post; users can either select a mood from a predefined list of 132 common moods such as "amused" or "angry," or enter free-text.

A large percentage of LiveJournal users chooses to utilize this option, tagging their postings with a mood. This results in a stream of hundreds of weblog posts tagged with mood information per minute, from hundreds of thousands of different users across the globe. Our focus in this demo is on providing access to the blogspace using moods as the "central" dimension. The type of information needs that we are interested in are best illustrated by questions such as: How do moods develop? How are they related? How do global events impact moods? And: Can global mood swings be traced back to global events?

We describe MoodViews, a collection of tools for analyzing, tracking and visualizing moods and mood changes in blogs posted by LiveJournal users.

## MoodViews

MoodViews tracks the stream of mood-annotated text made available by LiveJournal. At present, MoodViews consists of three components, each offering a different view of global mood levels, the aggregate across all postings of the various moods: *Moodgrapher* tracks the global mood levels,

*Moodteller* predicts them, and *Moodsignals* helps in understanding the underlying reasons for mood changes. We follow with a brief presentation of each of these services.

## Moodgrapher

Moodgrapher, the basic component of the system, plots the aggregate mood levels over time. Sample plots, showing irregular mood patterns following events with global implications, are shown in Figures 1 and 2.
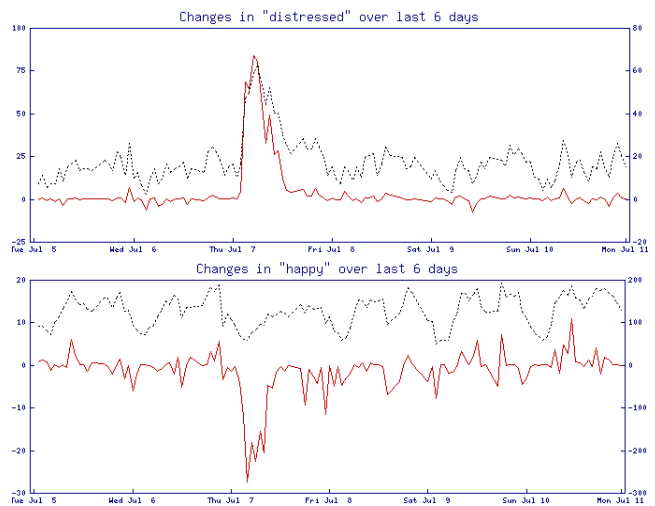


Figure 1: Global mood levels plotted by Moodgrapher: distress peaks and happiness plunges after terrorists strike London on July 7, 2005.

Users may select the timespan being observed, the moods to display, and may perform additional filtering and browsing options on the data, such as comparing a number of moods (Figure 3). An online version of Moodgrapher, displaying a subset of its full features, is available at `http://moodviews.com/Moodgrapher`.

## Moodteller

Moodteller goes a step beyond Moodgrapher, and uses natural language processing and machine learning to estimate the mood levels from the text of blog entries posted on LiveJournal, without using the mood tags provided by bloggers.
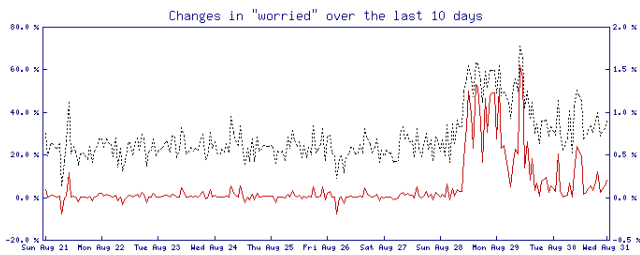
Figure 2: More global mood levels plotted by Moodgrapher: Hurricane Katrina brings an extended period of worry as it hits the U.S. Gulf Coast on August 29, 2005.
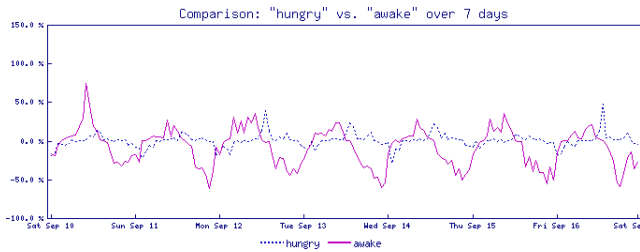


Figure 3: Demonstration of mood comparisons: daily increases in global appetite around lunch time, a few hours after the morning peaks in the "awake" state. Weekdays are more likely to raise hunger than weekends.

The estimation is then plotted and compared to the actual values based on tags provided by bloggers, and accuracy information is reported. An example plot is shown in Figure 4. Moodteller's estimation has proved to be robust and accurate, achieving correlation levels of up to 0.95 with the actual mood counts (Mishne & de Rijke, 2006). An online version of Moodteller, with a reduced feature set, is available at http://moodviews.com/Moodteller.
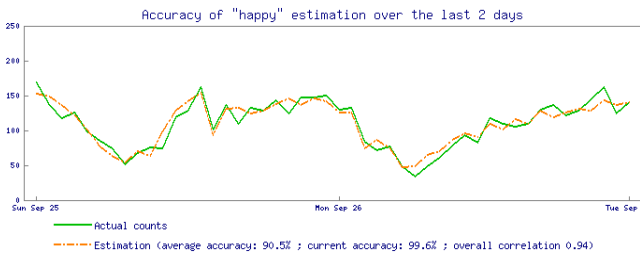


Figure 4: Moodteller in action: estimating "happiness" over two days at the end of September 2005.

## Moodsignals

Users of Moodgrapher witnessing irregular behavior, such as a spike in a certain mood, are often interested in discovering the cause of this spike—typically, an event affecting a large number of people. The final tool in our demonstration, Moodsignals, addresses this issue.

Moodsignals detects words and phrases which are associated with a given mood in a given time interval, using statistical frequency comparisons and burstiness models. With Moodsignals, users can simply select a region of a mood graph they are interested in, and view a ranked list of the terms most related to the mood at this time. An example is shown in Figure 5.
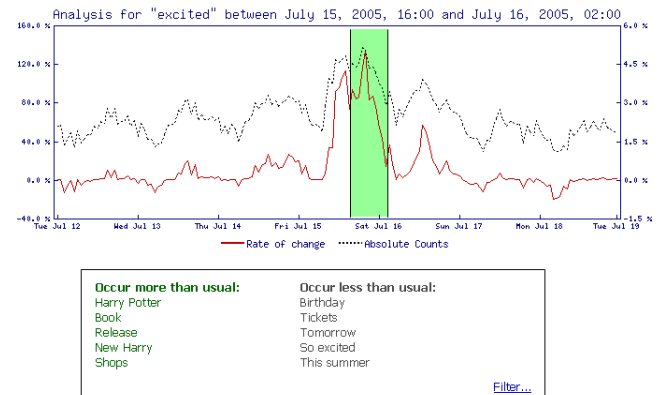


Figure 5: Moodsignals uncovering the excitement peak on July 16, 2005: the release of a new Harry Potter book.

## Ongoing and Future Developments

MoodViews enables a range of applications, providing a window into aggregate states-of-mind of masses of people.[1] At present, MoodViews is mostly focused on tracking and analyzing mood levels "in isolation." Moodsignals is a step towards relating changes in mood levels to global events. In our ongoing development efforts we are moving beyond Moodsignals by tracking, in parallel to blog postings, news feeds, discovering main stories and looking for the moods towards these stories in the blogs, and vice versa, looking up terms generated by Moodsignals in the news feeds, so as to identify emerging stories with a global impact.

## Acknowledgments

## References

G. Mishne & M. de Rijke. Capturing global mood levels using blog posts. In *AAAI 2006 Spring Symposium on Computational Approaches to Analysing Weblogs (AAAI-CAAW 2006)*, 2006.

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[1]As an aside, since portions of MoodViews were launched we have been contacted by a range of scientists and professionals interested in following up on the type of information MoodViews offers; in addition to text analysis researchers, these include psychologists, economists and investment bankers.