

# Mood Meter: Large-Scale and Long-Term Smile Monitoring System

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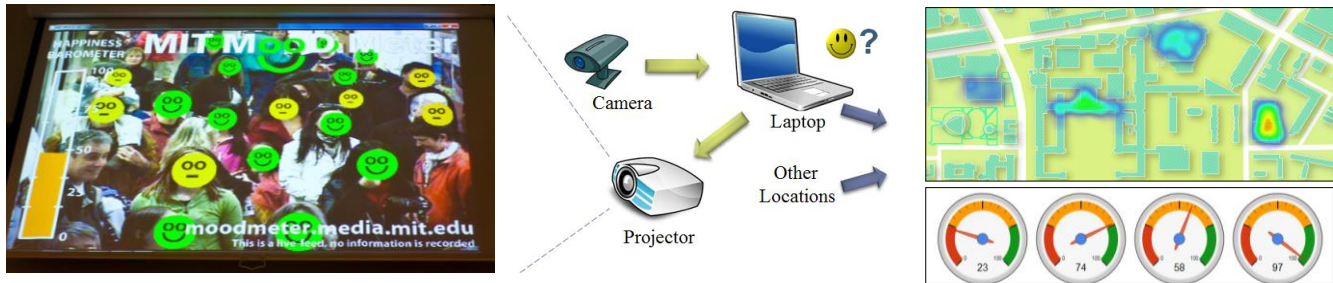


Figure 1. (a) Interactive display shown to passers-by. (b) Schematics of one installation. (c) Real-time graphs showing the amount of smiles.

## 1. Introduction

Have you ever wondered whether it's possible to quantitatively measure how friendly or welcoming a community is? Or imagined which parts of the community are happier than others? In this work, we introduce a new technology that begins to address these questions.

Mood Meter is a computer vision based system that automatically encourages, recognizes and counts smiles of a large environment or a community. For our project, we installed Mood Meter in a college campus during a 10-weeks long festival to count smiles of people at 4 different key locations. Our system collected aggregated anonymous information, and then displayed the information in real time in various intuitive and interactive formats on a public website, depicting the emotional footprint of the community as a function of smiles at any point in time.

## 2. Design

Mood Meter contained two different components. 1) A local set up in each location with a laptop, projector, and camera (as shown in Figure 1.b); 2) A web front that collected all the information from all the locations to generate a public website (<http://moodmeter.media.mit.edu/>) with several interactive graphs that reflected the emotional footprint of the campus community (Figure 1.c shows a heat map as a function of smiles). In each location, we had a camera set up looking over a large public space. The camera was connected with a laptop that would process the images to identify human faces, and smile intensity scores on each face (ranging from 0-100, 0 = no smile, 100 = very intense smile). Our computer vision system utilized OpenCV and Shore framework and extracted several geometric properties (e.g., distances between the corner lips and the nose) that are used to predict intensity of a smile.

To make it more fun and engaging, we projected the live-feed captured from the camera using large projectors, as shown in Figure 1.a. Since some people may not enjoy looking at themselves in a large projector in public places, we intentionally drew blobs on each face. The interface overlaid a yellow neutral face if the person was not smiling ("smile intensity" < 50%) and a green happy smiley otherwise. On the left side of the interface

display, there is a smile-barometer that depicted the aggregated smile estimation for everyone present in the image. For example, if there are two people smiling with "smile intensity" values being 70% and 80%, the smile-barometer would have a value of  $(70+80)/2 = 75\%$ . To encourage further participation, each person got a bow tie drawn around his/her neck whenever the aggregate smile intensity reached above 50%. We noticed that this feature often led members of a group to encourage other members to smile. In order to promote transparency, the lower part of the image contained the disclaimer, along with the project website address, that clearly stated, "This is a live feed, no information is recorded." Moreover, there was physical signage next to the camera explaining the purpose of the installation along with privacy details. The website also contained information about the project and how it addressed privacy.

## 3. Interaction

Over the ten weeks of installation, thousands of people passed by the installations and enjoyed interacting with the system in many different ways. Through our analysis, we were able to monitor and compare the emotional responses of people to several academic events such as holidays, exam periods, open houses, and graduation day. Analysis of the data revealed very periodic patterns, as well as a strong correlation with these events that supported traditional expectations of a university community.

## 4. Conclusions

We are excited about the other possible applications of the Mood Meter, especially in context of audience engagement, measuring stress in work environment, or even perhaps in a comedy club to see audience's live response. The Mood Meter was both a scientific experiment and an interactive installation, and succeeded in creating a novel emotional portrait of a public environment while respecting people's feelings and privacy.

\* Both authors contributed equally to this work