

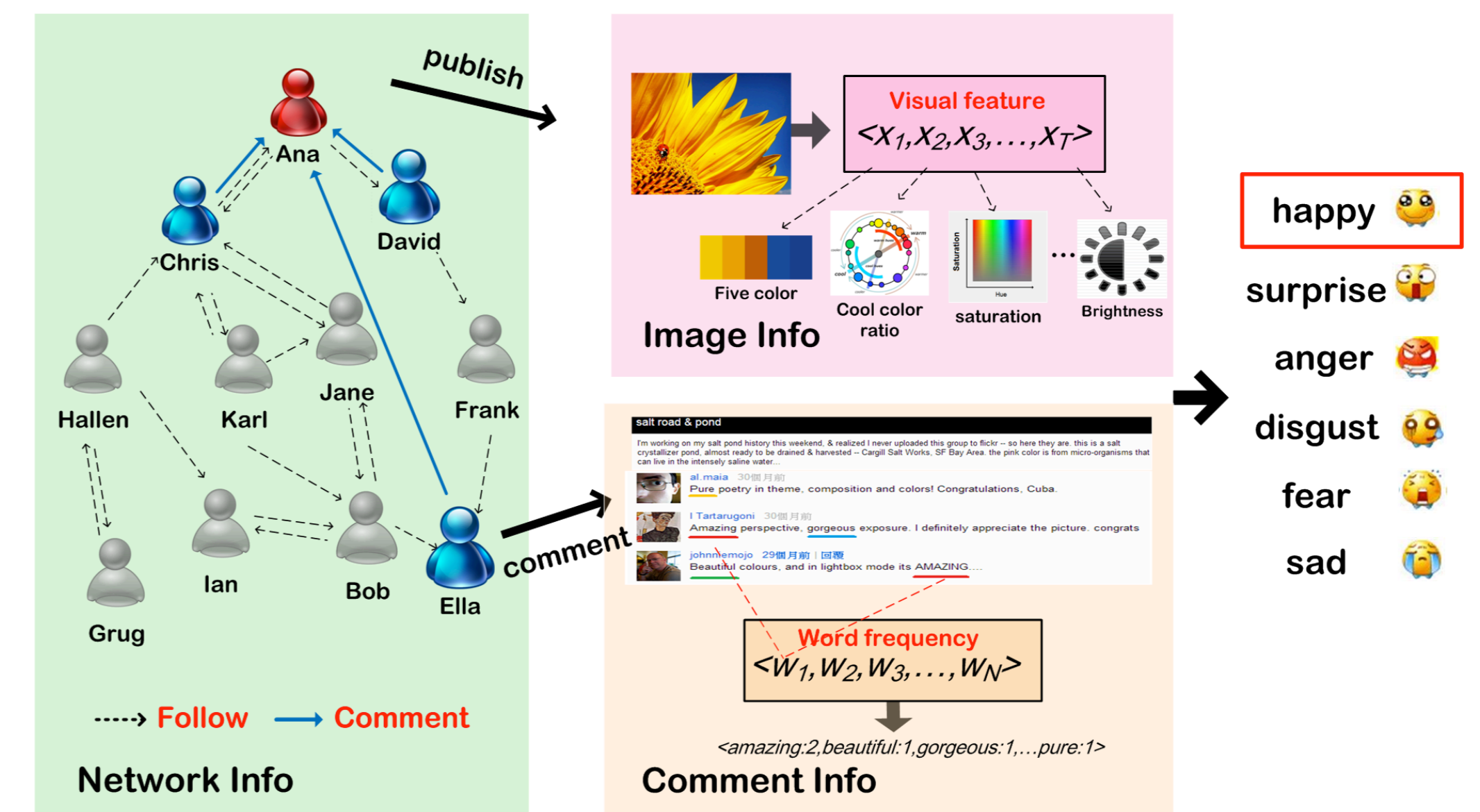
How Do Your Friends on Social Media Disclose Your Emotions?

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We extract the visual features from the images published by users, and emotional words (e.g., “amazing”, “gorgeous”) appeared in relevant comments. Our goal is to automatically extract emotions from the images by leveraging all the related information (visual features, comments, and friendships between users).



Emotion Learning Method

3、 Comment Generation

- We generate the comment d left by the user v
- Generate d 's topics when v is not influenced by u

$$z \sim \text{Mult}(\vartheta_d)$$

- Otherwise generate Z according to u 's emotion distribution

$$z \sim \text{Mult}(\theta_m)$$

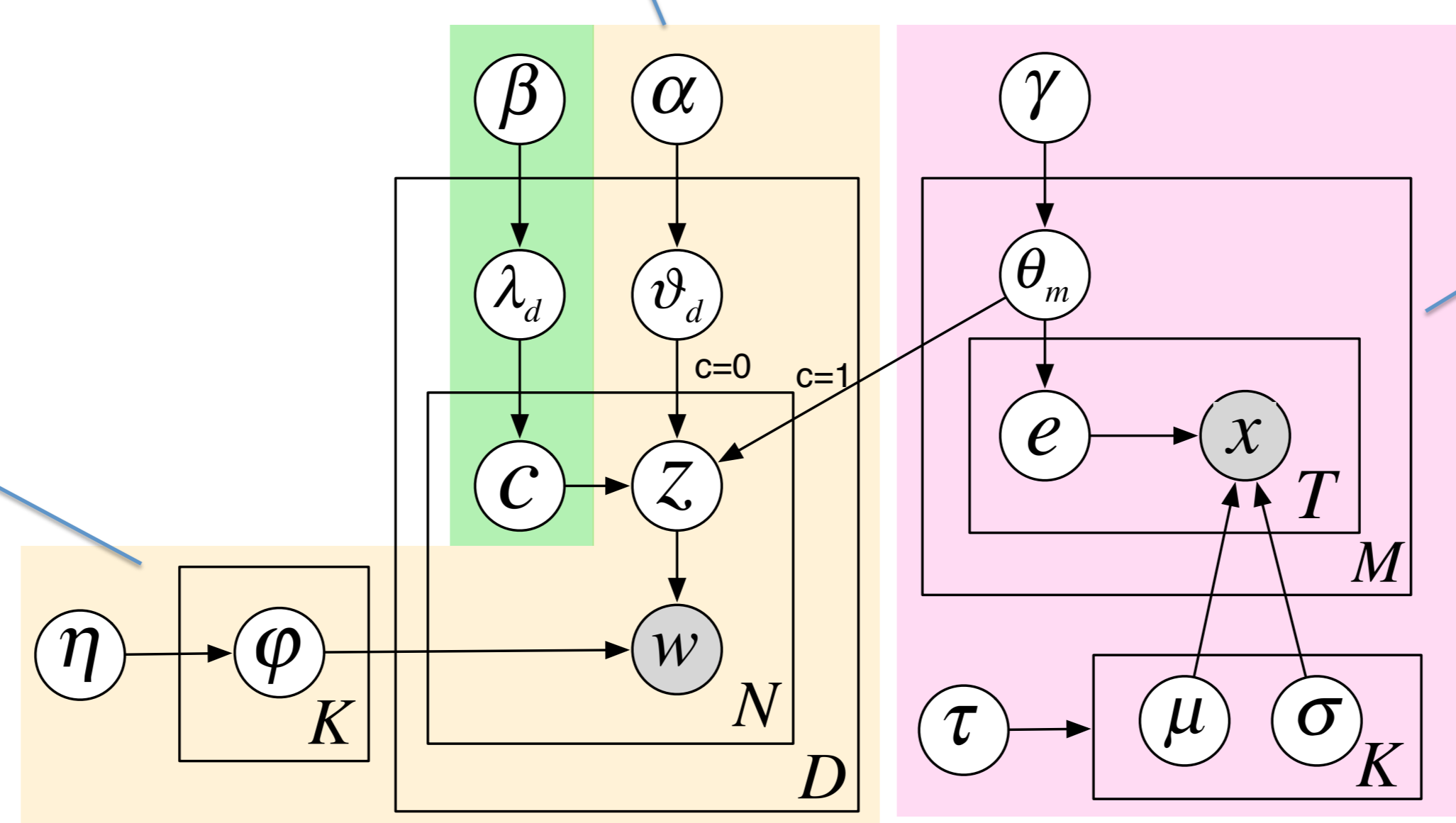
- Generate words in d

$$w \sim \text{Mult}(\varphi_d)$$

2、 Influence Generation

- For user v who leaves a comment, we generate c to determine whether u 's emotion influences v

$$c \sim \text{Mult}(\lambda_d)$$



1、 Image Generation

- For each image m published by user v , we model its generation process as follows

- Generate user v 's emotion e

$$e \sim \text{Mult}(\theta_m)$$

- Generate visual features X

$$x \sim N(\mu_e, \delta_e)$$

Emotion Inference

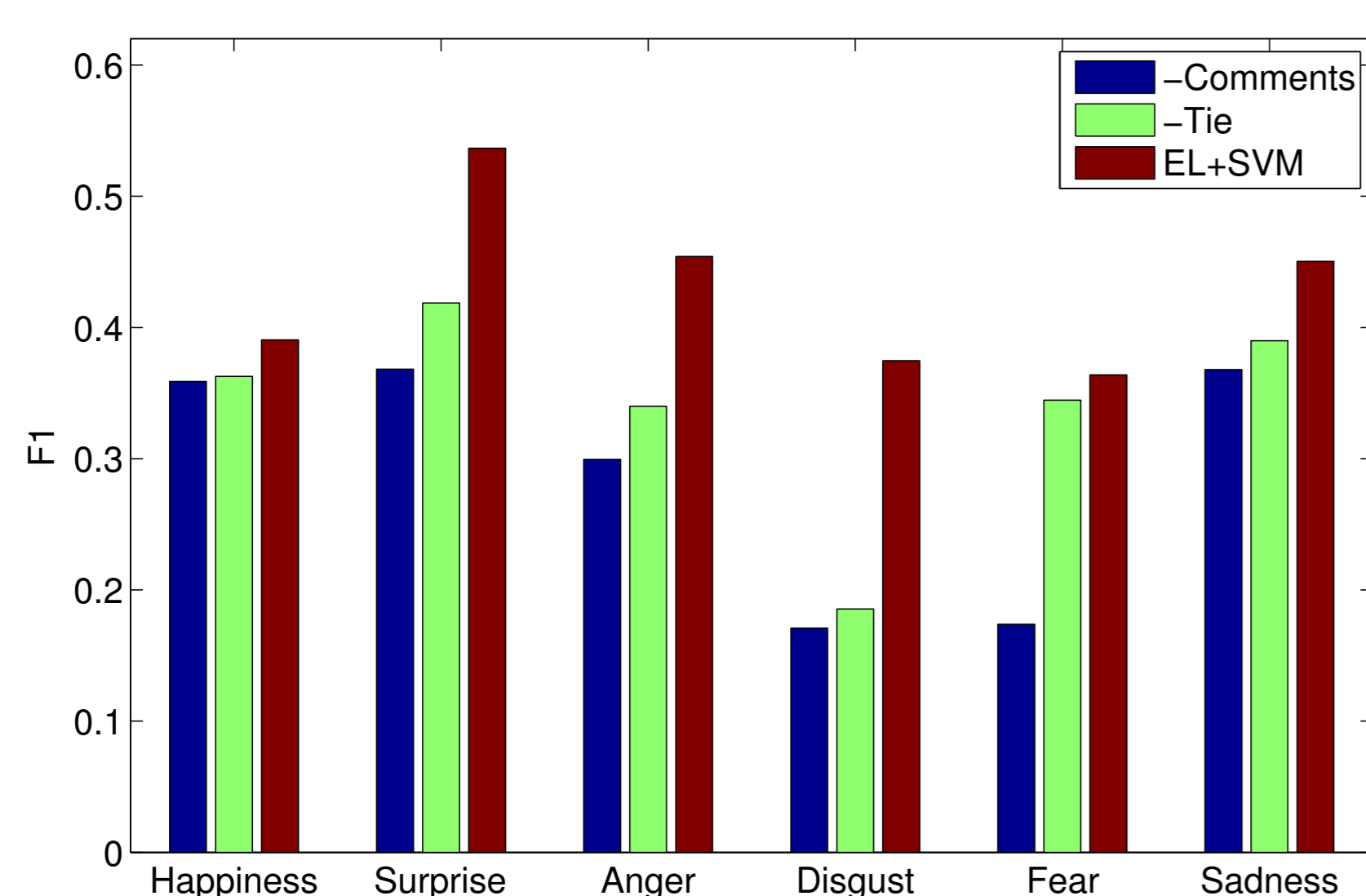
- Flickr Data:
 - 354,192 images, 557,177 comments, 6,735 users
- We consider Ekman's six emotions:
 - happiness, surprise, anger, disgust, fear, sadness
- The ground truth is collected according to user's tags.
- EL+SVM: we use our method to learn the emotion distribution of images θ_m and use SVM as a classifier.
- We conduct a 5-fold cross validation to evaluate baselines.

Table 2: Performance of emotion inference.

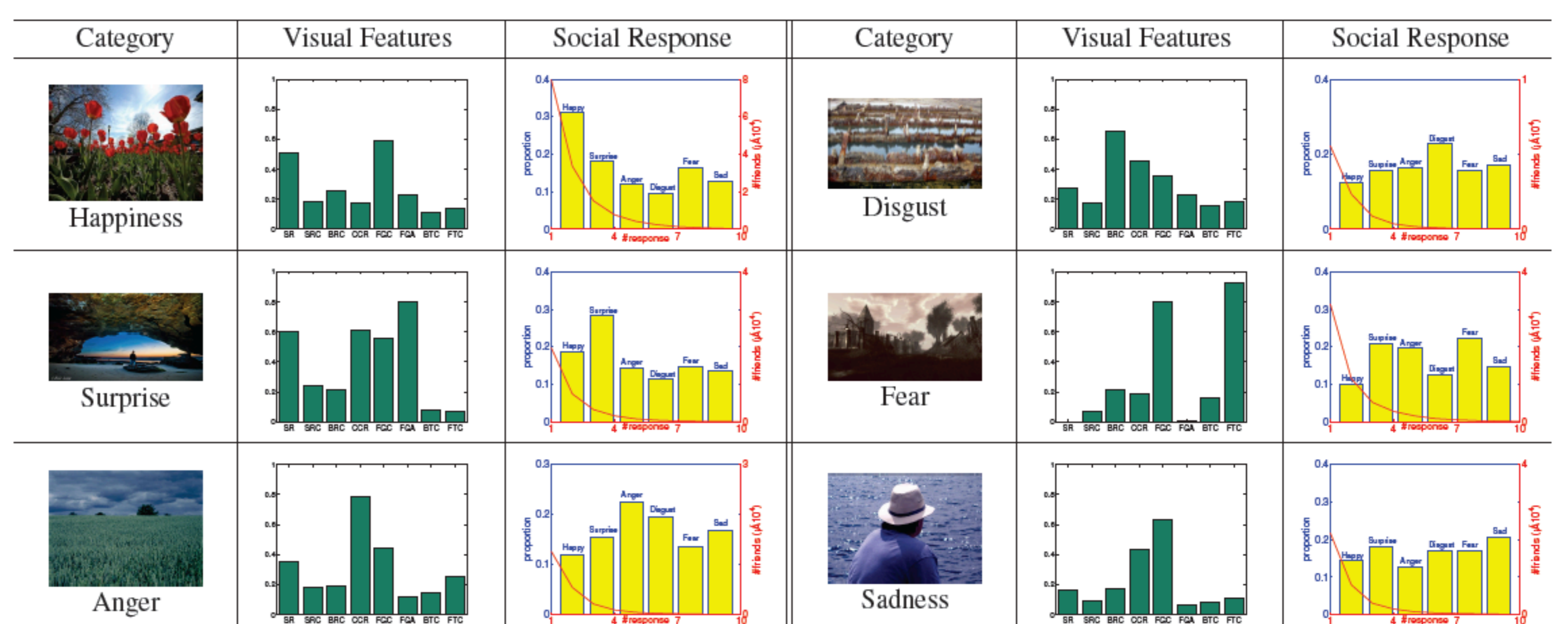
Emotion	Method	Precision	Recall	F1-score	Emotion	Method	Precision	Recall	F1-score
Happiness	SVM	0.242	0.279	0.259	Disgust	SVM	0.192	0.236	0.212
	PFG	0.337	0.312	0.324		PFG	0.309	0.374	0.339
	LDA+SVM	0.333	0.727	0.457		LDA+SVM	0.223	0.223	0.223
	EL+SVM	0.367	0.410	0.388		EL+SVM	0.331	0.432	0.374
Surprise	SVM	0.197	0.037	0.063	Fear	SVM	0.204	0.264	0.230
	PFG	0.349	0.340	0.345		PFG	0.301	0.408	0.347
	LDA+SVM	0.218	0.048	0.078		LDA+SVM	0.211	0.225	0.217
	EL+SVM	0.425	0.516	0.466		EL+SVM	0.371	0.343	0.356
Anger	SVM	0.188	0.105	0.135	Sadness	SVM	0.225	0.365	0.278
	PFG	0.191	0.142	0.163		PFG	0.357	0.286	0.317
	LDA+SVM	0.222	0.109	0.146		LDA+SVM	0.257	0.278	0.267
	EL+SVM	0.390	0.370	0.380		EL+SVM	0.561	0.617	0.588

Averagely +37.4% in F1

Analysis



User comments and social ties help a lot when inferring Disgust and Fear.



The positive emotions attract more response (+4.4 times), and more easily to influence others to have the same emotion.