

Distilling Community Emotions In Real-Time, From Social Media.

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Theoretical Framework:

The framework upon which this endeavor is based, is centered around the notion of an entity, and its corresponding attributes.

Entity:

An entity represents an individual in the community.

For every entity, there exist three corresponding attributes:

1. Self status vector (SSV).

This is an *e-dimensional array* representing the emotional state of said entity, at a given instance in time. The different components of this vector correspond to the extent of the selected basis emotions, and *e* represents the length of the basis vector set.

For example, using basis emotions [happy, indifferent, sad], an SSV of [0.6,0.3,0.1], represents an entity who is predominantly happy at the concerned instance of time.

2. Community address vector (CCV).

This is an *(c-1)-dimensional array*, representing the level of intimacy of said entity, to all of the other entities comprising the community. Where *c* represents the community size.

For example, a CCV of [0.6,0.4,0.1] represents an entity who is most intimate with the (designated) first member of the community, followed by the second, and then the third— in a community comprising four entities. This intimacy metric is derived from the frequency of interactions between said entities.

3. Relationships status vector (RSV).

This is a *(c-1 x e) array*, representing the emotional state of the relationships of an entity, with all of the other entities in the community.

For example, an RSV of $\begin{bmatrix} 0.3, 0.3, 0.4 \\ 0.2, 0.7, 0.1 \end{bmatrix}$

represents two relationships - the first predominantly disapproving, and the second predominantly indifferent.

Extracting Entity Attributes.

Sources of Information:

1. Status posts:

Who is posting, and how they are feeling.

2. Comments on status posts.

Who is commenting, and how they are feeling (about the post, v absolutely?)

3. Reactions to posts, and comments.

Who is reacting, and how they are feeling.

NB: In the case of posts and comments, emotional information is extracted via sentiment analysis. In the case of reactions, predefined sentiments (case in point Facebook) are employed.

Visualizing Community Emotions.

This visualization is done by simply making use of the three defined vector attributes of each entity.

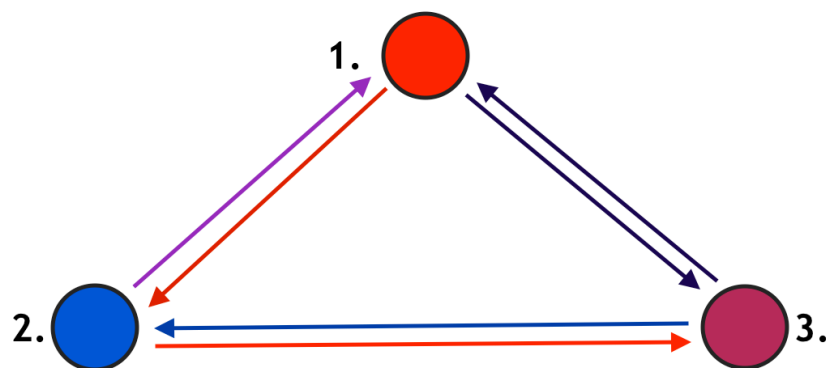
Every entity is depicted as a node, and relationships as directional paths intermediating concerned nodes.

1. **The SSV** is visualized as the color of the corresponding node, as determined by a selected color scheme. For example, [R,G,B] could be employed to represent [happy, indifferent, sad].

2. **The CCV** exemplified in the distribution of nodes in the network—. More intimate entities are — closer together in the network, while less intimate ones are farther apart.

3. **The RSV** row relating two nodes, is visualized as the color of the path connecting them.

For example, below is shown the visualization of a community comprising three members, with the various vectors depicted as outlined.



Plausible attribute data appertaining to Entity 1 in the above illustration is:

Entity 1:

```
[ SSV: [0.8,0.1,0.1]
  CCV: [0.5,0.5]
  RSV: [[0.8,0.1,0.1]
        [0.1,0.2,0.7]]
]
```

Uses:

1. Provides an intuitive, real-time summary of how a community is feeling. (**Moonshot suggestion:** Could be incorporated into a glowing luminous sculpture, in which bulbs represent community members. This would not just be an aesthetically pleasing home/office installation, but also an invaluable functional one.)
2. Provides information on the sub-clusters that exist within the group, based on the frequency of interactions that happen between members. Could be useful in analyzing the instantiation of friendships and relationships, and their evolution over time.
3. ...

Shortfall:

- Works with the underlying assumption that community interaction on social media is representative of interaction in reality.