THEMIS.COG

Theoretical and Empirical Modeling of Identity and Sentiments in Collaborative Groups
PROJECT GOALS

• *Understanding New Forms of Collaboration*
  • Online Collaborative Networks
  • GitHub

• *Expanding Theories of Social Interaction*
  • maintaining social relationships vs. maximizing personal gains
  • relational vs. transactional interactions

• *Leveraging Theories of Identity for Computational Social Science and Targeted Analysis of Big Data*
  • Affect Control Theory
  • Affective alignment as key motivating factor for group interactions
GitHub.com

- 6 million active users
- 20 million active repositories
- 10 million active issues
- 331 thousand active organizations
- Open source
The Good, The Bad, and the Ugly

yay no more saving addresses twice in memory

i am grateful that you took the time to write it

is this github being stupid?

dam i was s sleepy sorry let me fix that

Christ people. This is just sh*t.

Wtf? Who is fucking with my if Statement?!
Understanding New Forms of Collaboration: Effects of Emotions

Fig1. - Problems encountered in open source

Source: opensourcesurvey.org

- Incomplete or confusing documentation
- Unresponsiveness
- Dismissive responses
- Conflict
- Unexplained rejection
- Unwelcoming language or content
Understanding New Forms of Collaboration: Effects of Personality Traits

BIG 5 Personality: Openness, Conscientiousness, Neuroticism, Agreeableness, Extraversion
Understanding New Forms of Collaboration: Predicting reactions

Chalarangelo commented on Sep 19, 2018

It's a bug that only appears in Chrome, we are already aware of it and trying to figure out how to fix it.
### Understanding New Forms of Collaboration: Predicting reactions

<table>
<thead>
<tr>
<th>Github Pull Request comment</th>
<th>Predicted reaction/emoji</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open source software is a thankless task. I dont fault any package maintainer for walking away without explanation</td>
<td>😞 🚀 ✨</td>
<td>93.0% 4.35% 1.41%</td>
</tr>
<tr>
<td>This isn't expected to be resolved anytime soon, so I opted for a joke!</td>
<td>😄 😞 🚀</td>
<td>25.8% 21.9% 18.8%</td>
</tr>
<tr>
<td>I would like this feature as well! Passing a cert would be easier since we have multiple developers using these build scripts that run match</td>
<td>👍 😞 😘</td>
<td>65.0% 21.9% 18.8%</td>
</tr>
</tbody>
</table>
Understanding New Forms of Collaboration: Topology of Groups on GitHub

Cluster 1

Cluster 2

Cluster 3

Cluster 4

Cluster 5
Expanding Theories of Social Interaction: Modeling the Development of Subcultural Meanings as the Interaction of Culture and Structure
Leveraging Theories of Identity: Group Simulator

- Affect Control Theory
- Emotional Alignment
- Based on Identity
- Social dynamics from group structure
- Dyadic Interactions
- Action on-the-group
Leveraging Theories of Identity: Impact of Structures on Group Dynamics

"man" power: 1.5

Egalitarian

Power Differential

less

more

"boss" power: 2.5

Hierarchical

"client" power: 0.5
Leveraging Theories of Identity: Simulating the Impact of Group Structures on Group Dynamics
Conclusions

• Group dynamics on GitHub are partially based on emotion and identity
• Emotion is difficult to measure on GitHub
• Other social networks may provide more varied emotional content
• Network analysis of groups provides deep insights into relational structures in online collaborative work
• Leveraging this information is crucial for positive impacts of online collaborations

https://themis-cog.github.io/
https://cs.uwaterloo.ca/~jhoey