



UNIVERSITY OF
WATERLOO



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Theoretical and Empirical Modeling of Identity
and Sentiments in Collaborative Groups

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Fachhochschule Potsdam
University of
Applied Sciences





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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



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GitHub.com

- **6 million** active users
- **20 million** active repositories
- **10 million** active issues
- **331 thousand** active organizations
- **Open source**

Add New Features #22

Edit

Merged akofink merged 5 commits into `master` from `JustinAMiddleton-NewFeatures` 21 minutes ago

Conversation 1

Commits 5

Files changed 3

+188 -2



JustinAMiddleton commented 43 minutes ago

I added a few new features to the project that were proposed in issue #20. Documentation included.



JustinAMiddleton added some commits 43 minutes ago



Add New Features ...

a735593



Create codebase2.txt

4de32a1



Update README.md

a77f9b4



Update codebase.txt

a07e70a



Update codebase2.txt

9b83ab6



akofink merged commit `f03e411` into `master` 21 minutes ago



akofink commented 20 minutes ago

Owner

Thanks for the contribution! Accepted.

Labels

None yet

Milestone

No milestone

Assignee

No one assigned

Notifications

Unsubscribe

You're receiving notifications because you authored the thread.

2 participants





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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 sleepy sorry let me fix that

Christ people. This is just sh*t.

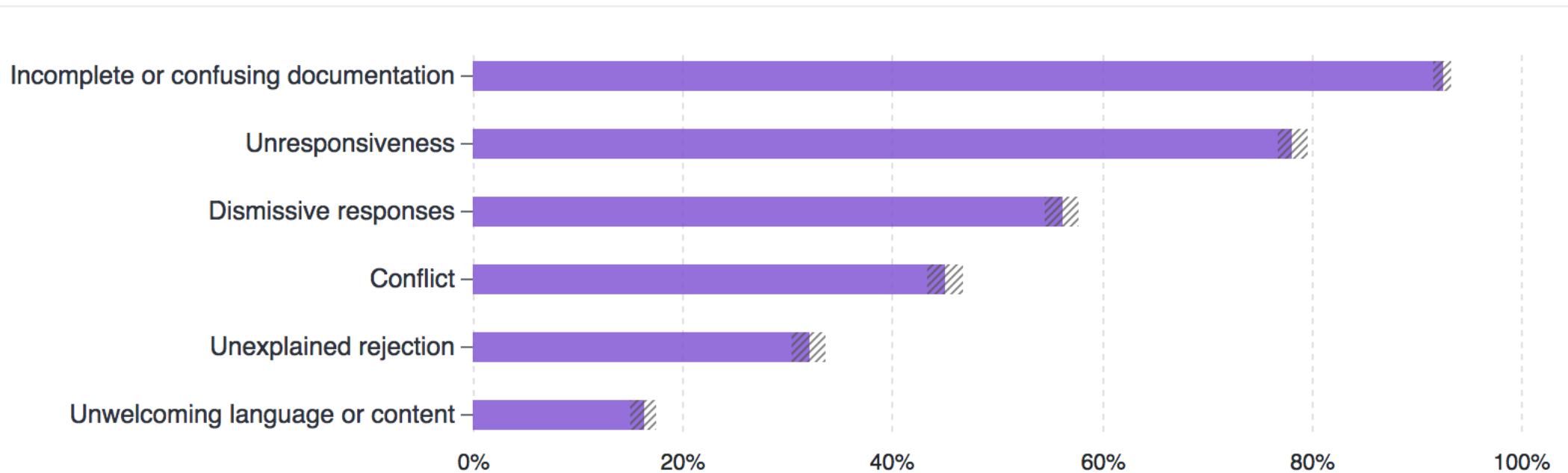
Wtf ? Who is fucking with my if Statement?!



Understanding New Forms of Collaboration: Effects of Emotions

Fig1. - Problems encountered in open source

Source: [opensourceurvey.org](https://www.opensourcesurvey.org)



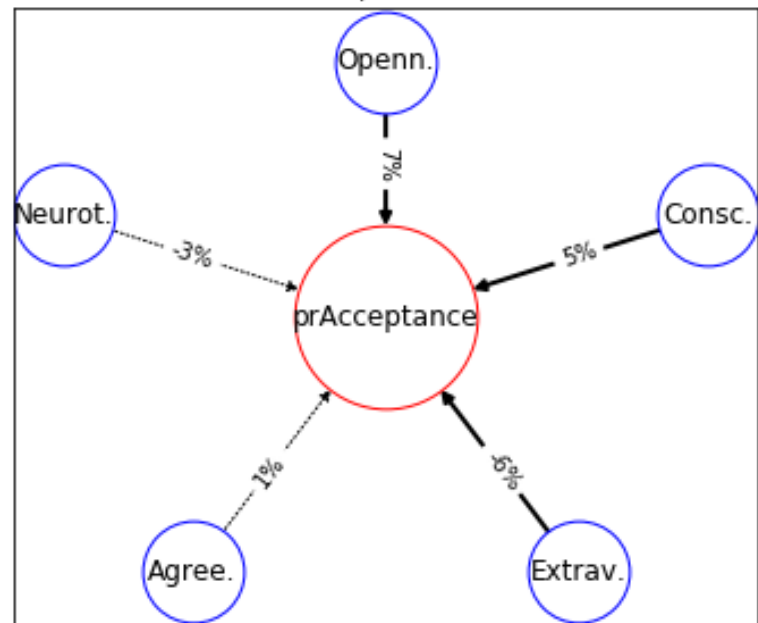


Understanding New Forms of Collaboration: Effects of Personality Traits

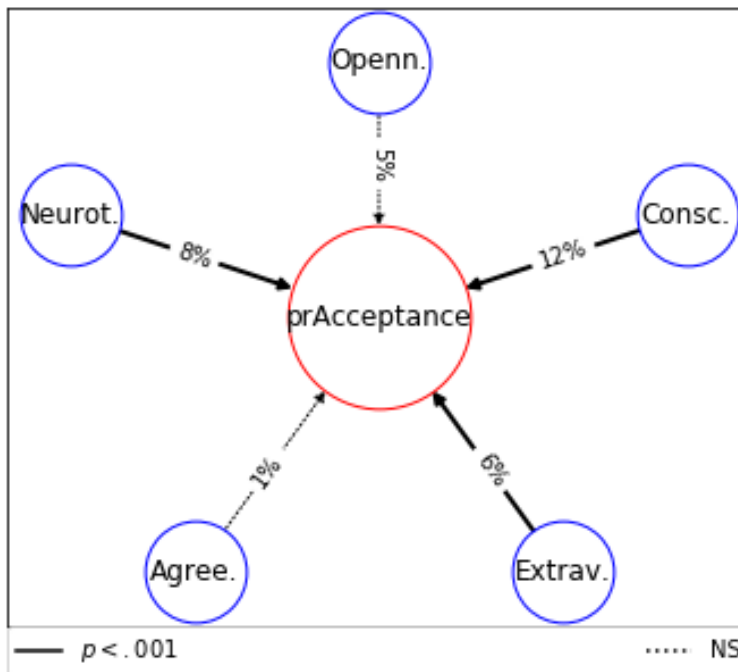
BIG 5 Personality: Openness, Conscientiousness, Neuroticism, Agreeableness, Extraversion

Odds Ratio of the Developer's Personality Traits on Pull Request Acceptance

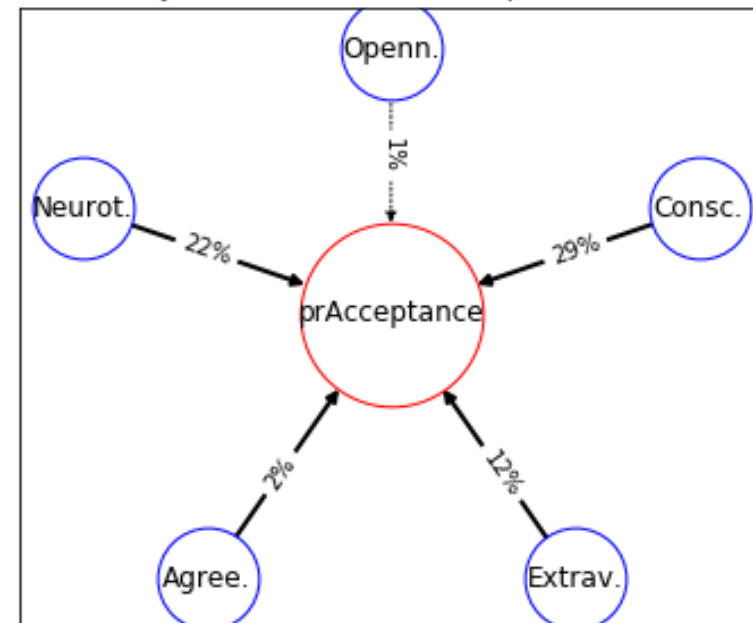
Requester



Closer



Personality Difference between Requester and Closer





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Understanding New Forms of Collaboration: Predicting reactions

Chalarangelo commented on Sep 19, 2018

Member



It's a bug that only appears in Chrome, we are already aware of it and trying to figure out how to fix it.



3



1

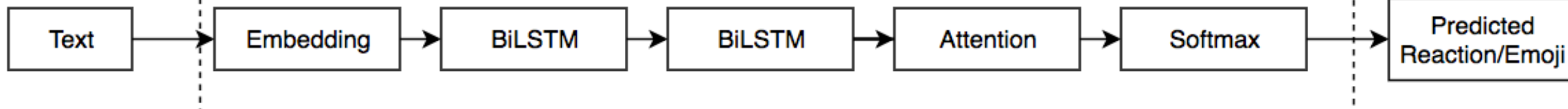


1



1

DeepMoji Architecture





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Understanding New Forms of Collaboration: Predicting reactions

Github Pull Request comment

Predicted reaction/emoji

Open source software is a thankless task. I dont fault any package maintainer for walking away without explanation



93.0%



4.35%



1.41%

This isn't expected to be resolved anytime soon, so I opted for a joke!



25.8%



21.9%



18.8%

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



65.0%



21.9%

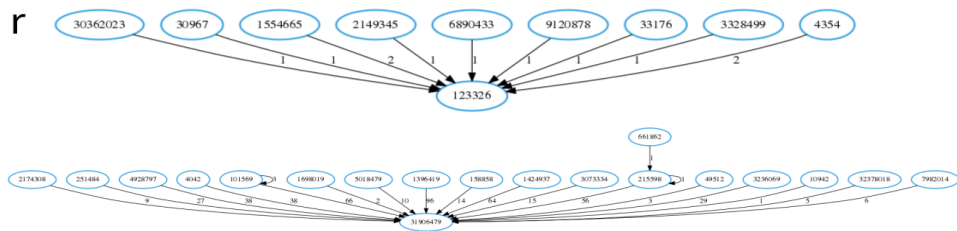


18.8%

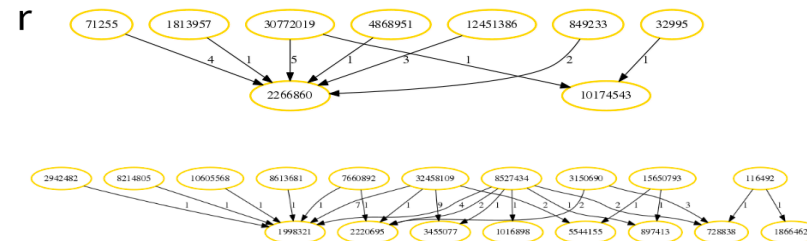


Understanding New Forms of Collaboration: Topology of Groups on GitHub

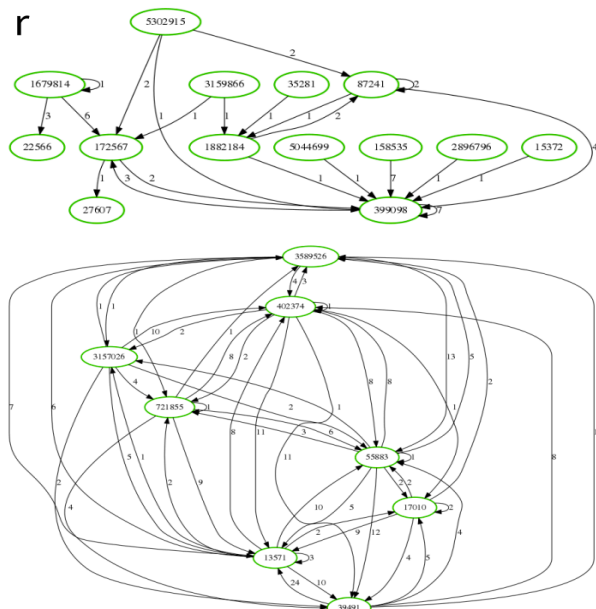
Cluster 1



Cluster 3



Cluster 2



Cluster 4



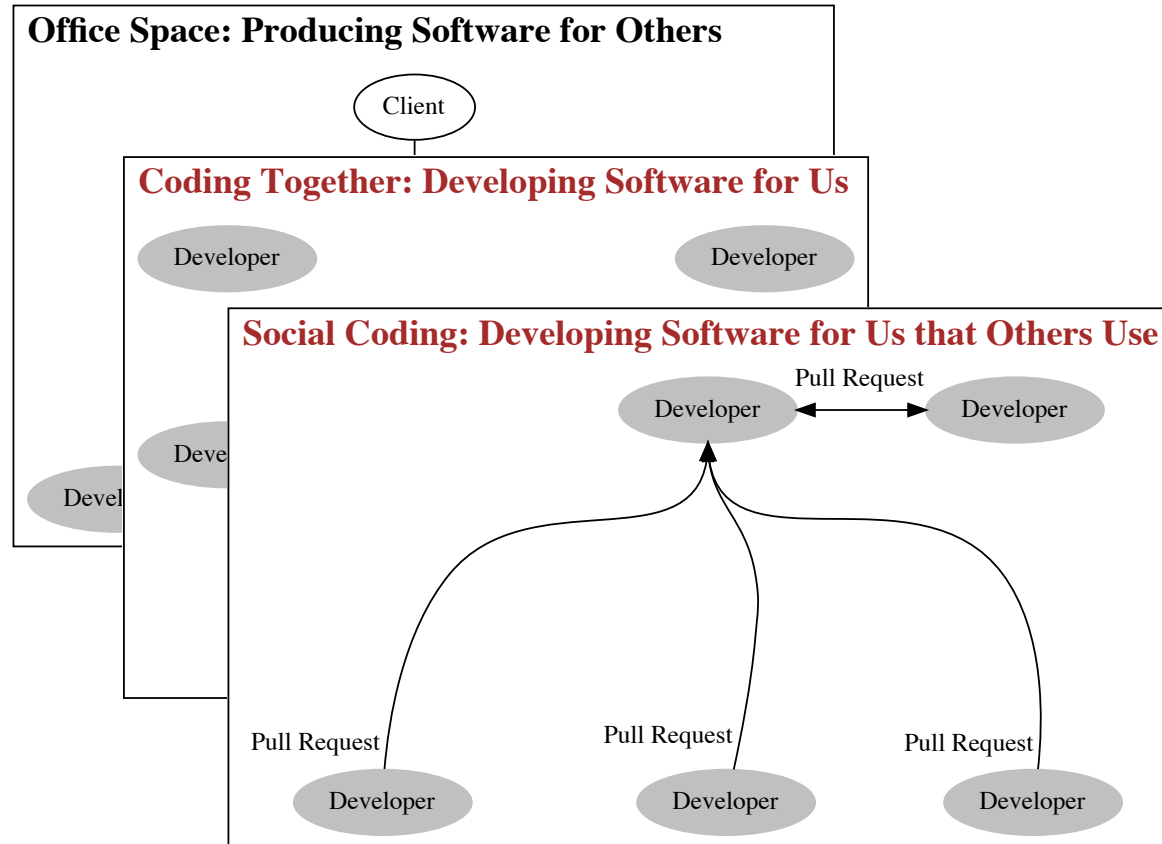
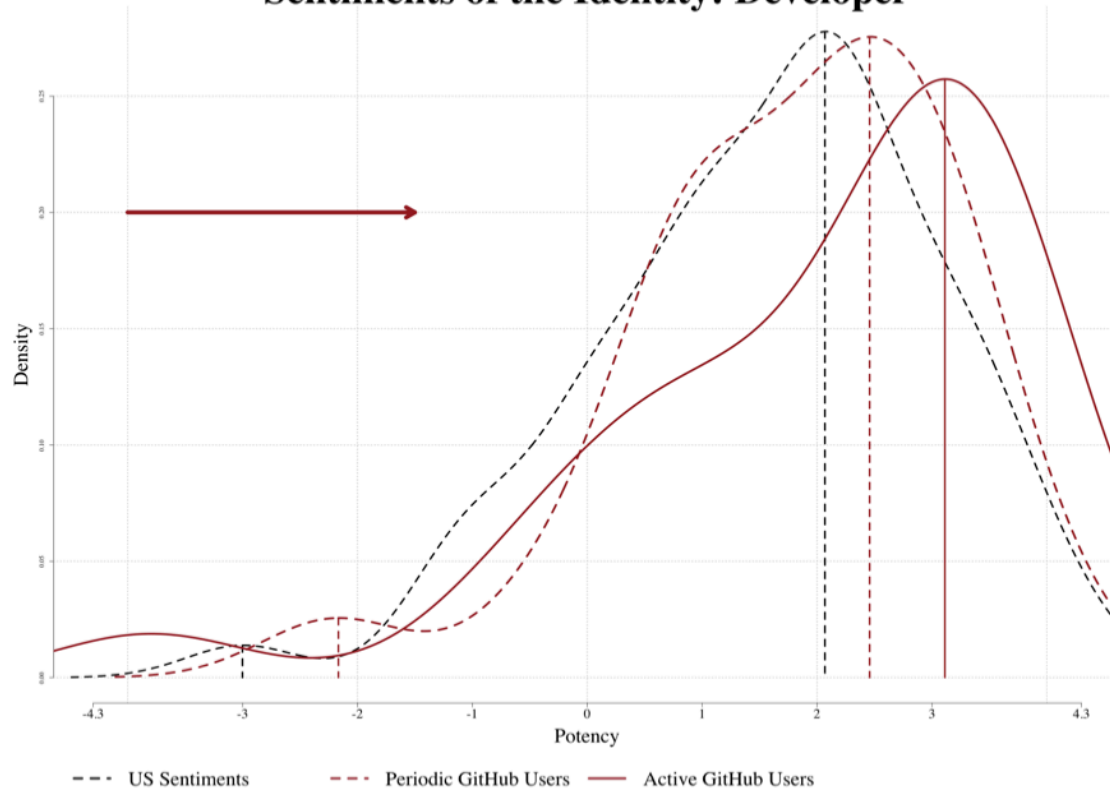
Cluster 5





Expanding Theories of Social Interaction: Modeling the Development of Subcultural Meanings as the Interaction of Culture and Structure

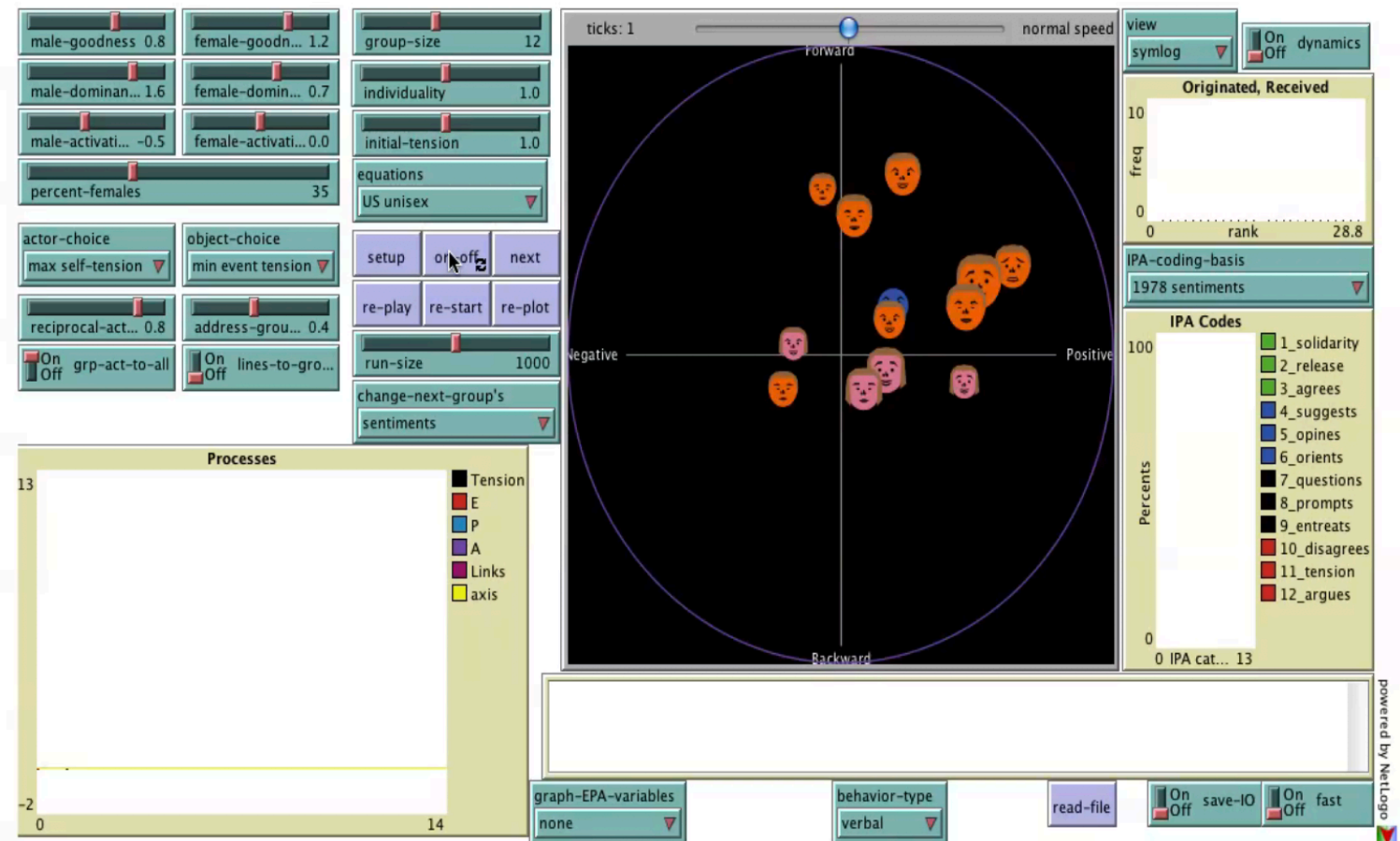
Sentiments of the Identity: Developer





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**





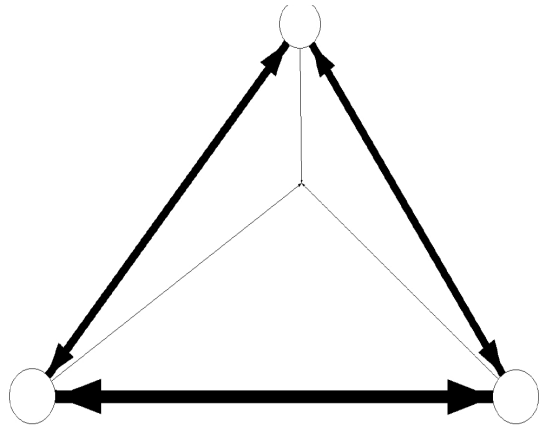
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Leveraging Theories of Identity: Impact of Structures on Group Dynamics

“man” power: 1.5

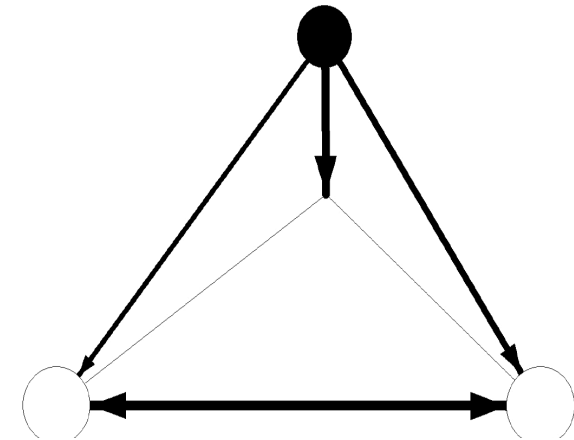


“man”

“man”

Egalitarian

“boss” power: 2.5



“client” power: 0.5

“client”

Hierarchical



less

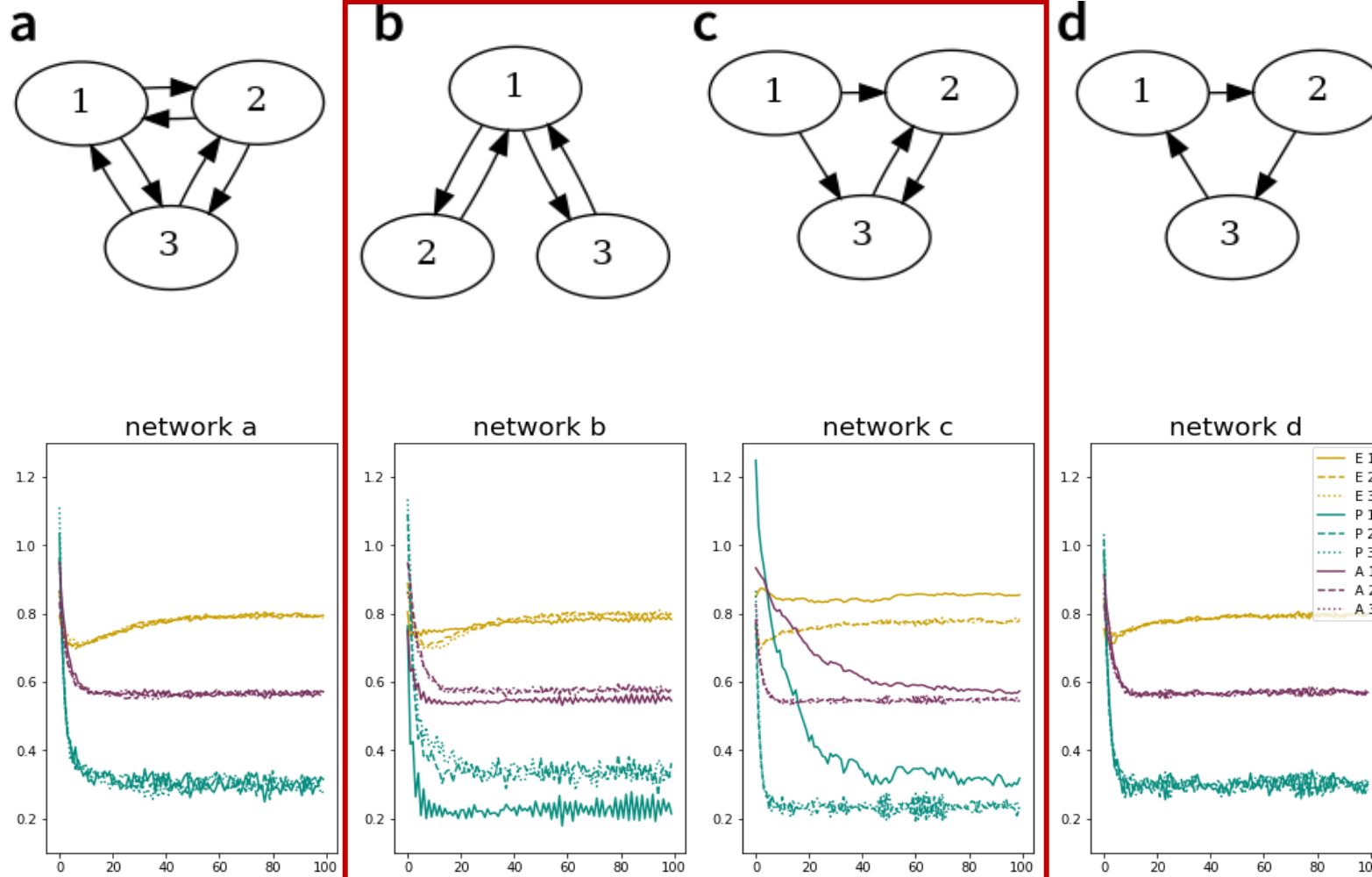
Power Differential



more



Leveraging Theories of Identity: Simulating the Impact of Group Structures on Group Dynamics





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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>



@drjessehoey