“On the Personality Traits of StackOverflow Users”

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Motivation

- Software is becoming increasingly “social”
- Developers interact through social networks of experts

• How do personality traits impact this interaction?
  – Also examined by Rigby et al.
Research Questions

RQ1: Do the top reputed authors’ personality types differ?

RQ2: Do author personalities vary by reputation?

RQ3: Do authors of posts belonging to the same topics share similar personality types?

RQ4: Do personality traits have an impact on the process of up-voting/down-voting posts?
~10 million StackOverflow posts
“Big Five Personality Traits”
Linguistic Inquiry and Word Count (LIWC)

Dictionary of 2700 English words
70 Distinct Dimensions (e.g., positive emotions)

“I tried to understand the utility of backbone.js from its site, but I still couldn't figure out much. Can anybody help me by explaining how it works and how could it be helpful in writing better JavaScript?”

<table>
<thead>
<tr>
<th>LIWC Dimension</th>
<th>Your Data</th>
<th>Personal Texts</th>
<th>Formal Texts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-references</td>
<td>7.50</td>
<td>11.4</td>
<td>4.2</td>
</tr>
<tr>
<td>Social words</td>
<td>10.00</td>
<td>9.5</td>
<td>8.0</td>
</tr>
<tr>
<td>Positive Emotions</td>
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<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Negative emotions</td>
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<td>2.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Cognitive words</td>
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<td>7.8</td>
<td>5.4</td>
</tr>
<tr>
<td>Articles</td>
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<td>6.0</td>
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<tr>
<td>Big words</td>
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<td>13.1</td>
<td>19.6</td>
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<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
Computing the Personality Traits

Qs: I *tried* to understand the utility of backbone.js from its site, but I still *couldn't* figure out much. Can anybody help me by explaining *how* it works and *how* could it be helpful in writing better JavaScript?

Ans: Backbone.js is basically an uber-light framework that allows you to structure your Javascript code in an MVC (Model, View, Controller) fashion where... Some *pros* that I discovered with Backbone: extremely *useful* underscore utility library, code is *well* documented and a *great* read... There is also this *wonderful* Collection class that lets you deal with collections of models...

**Neuroticism**

**Agreeableness**

**Openness**

... = First Person Singular – Articles – Positive Emotions + Negative Emotions

= First Person Singular – Big Words + Positive Emotion – Negative Emotions

= ...

Pennebaker et al.

<table>
<thead>
<tr>
<th></th>
<th>Neuroticism</th>
<th>Extroversion</th>
<th>Openness</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
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</thead>
<tbody>
<tr>
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<td>-2.7</td>
<td>15.32</td>
<td>-1.81</td>
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<tr>
<td>Answer</td>
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<td>8.12</td>
<td>21.60</td>
<td><strong>10.82</strong></td>
<td>-13.51</td>
</tr>
</tbody>
</table>
Methodology

Stack Overflow Posts → Preprocessing
- Discard code snippets
- Remove HTML tags → LIWC → Personality traits’ values

The authors share similar personality traits

Tukey’s HSD

Authors who share similar personality traits

$H_0$: The means are equal
$H_1$: The means are not equal

ANOVA

$H_0$: The means are equal
$H_1$: The means are not equal

Authors who share similar personality traits
RQ1: Do the top reputed authors’ personality types differ?
RQ2: Do author personalities vary by reputation?
RQ2: Do author personalities vary by reputation?

Top vs. Medium
RQ2: Do author personalities vary by reputation?

![Graph showing 95% Confidence Intervals of difference of means for Neuro, Extro, Open, Agree, and Conc between Top vs. Medium, Medium vs. Low, and Low categories.]

95% Confidence Intervals of difference of means
RQ3: Do authors of posts belonging to the same topics share similar personality types?
RQ4: Do personality traits have an impact on the process of up-voting/down-voting posts?
Conclusions

• We used LIWC to explore the personality traits of StackOverflow authors
  – top reputed authors are less neurotic, more extroverted and open
  – authors of up-voted questions are less neurotic

• Maybe managers could use these insights to hire more “effectively social” programmers

Thank you!😊