

# Understanding the Personality Traits of Stack Overflow Users: Text Analysis with IBM Personality Insights

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## Abstract

Personality and Emotion have become popular areas of study in Software Engineering in recent years. On the surface, personality seems to lack a connection to the software creation, but the humans that create the software have differing personality types just like in any other industry. This project seeks to further understand the connection between personality traits and the relative success of Stack Overflow users.

## Background Information

### The Big Five

The Big Five personality facets have been regarded as a reliable way to map an individual's personality. Each individual is given a score for **Openness**, **Extroversion**, **Neuroticism**, **Agreeableness**, and **Conscientiousness**. Because of this, there is wide general understanding of the personality traits we derive from our experiment.

## Stack Overflow

One of the most commonly used question and answer forums in computer programming, **Stack Overflow** has helped many a CSC/SE student improve their code and figure out tough problems. Questions and answers can be voted on, favorited, and edited by the community. Users are given a "Reputation" score based on positive community interactions.

## Tools/Technologies

**Data:** SOTorrent provides a SQL database for the Stack Overflow Datadump, queries were run with a Java application and the MySQL Java connector

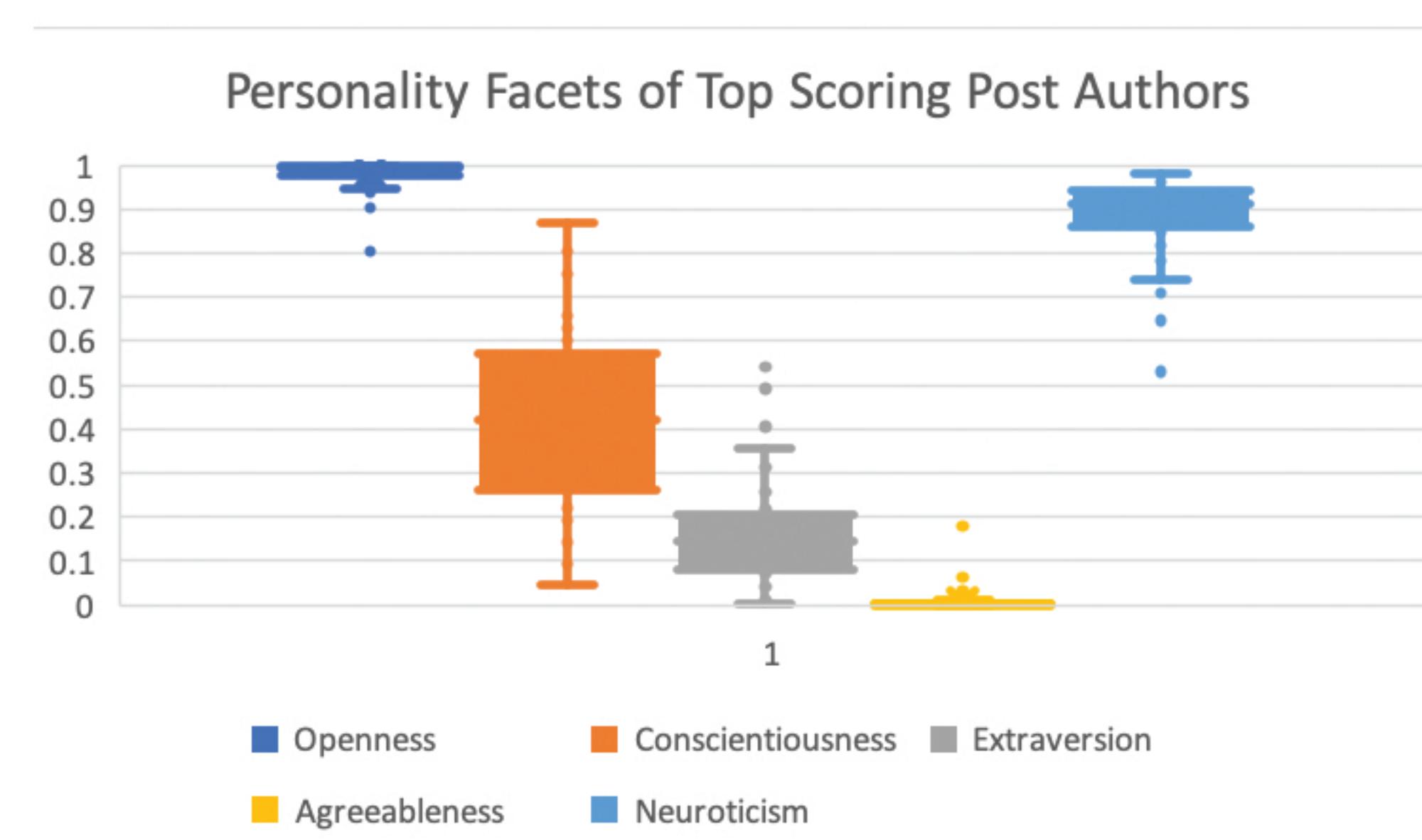
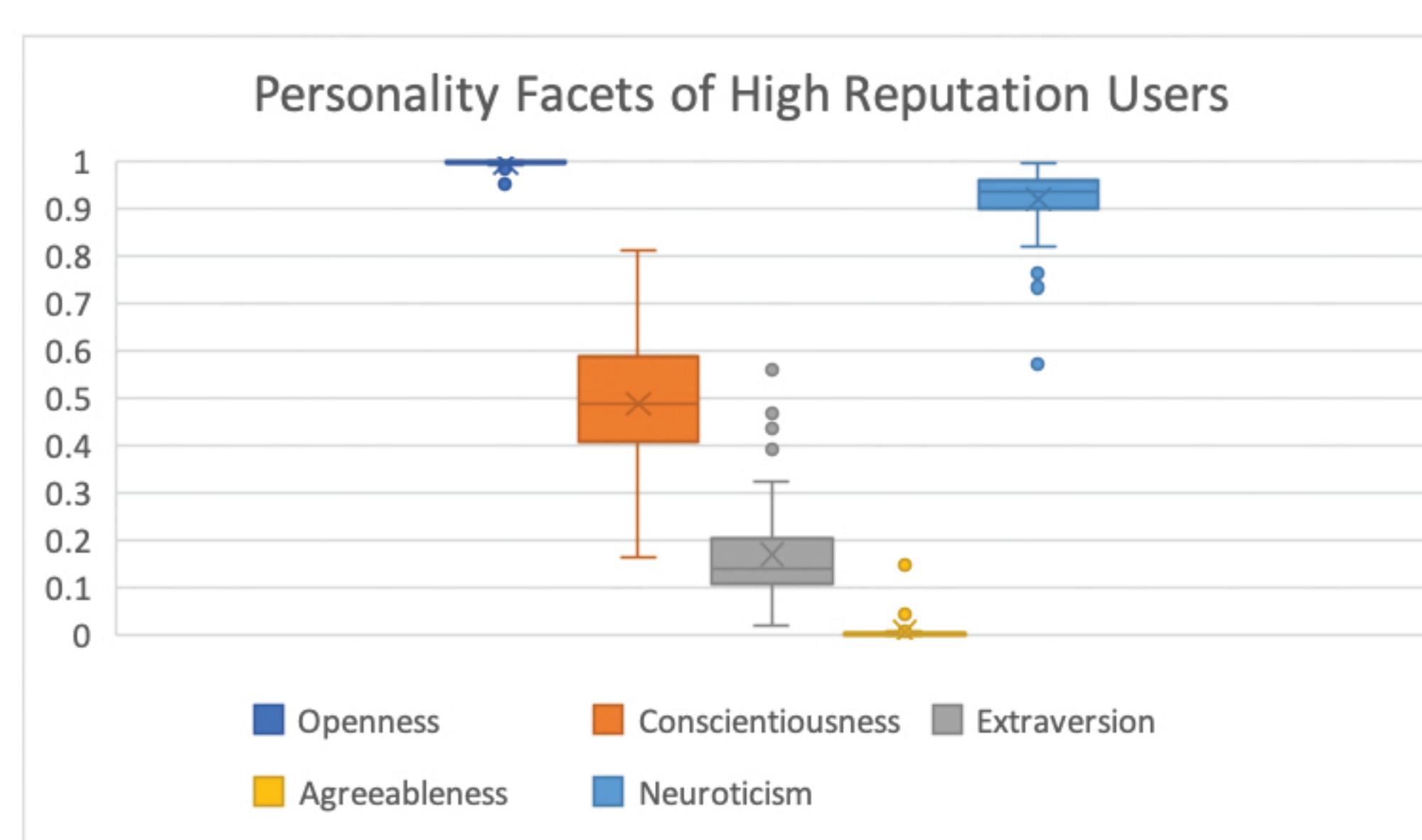
**Analysis:** IBM Personality Insights is an API from IBM Cloud platform using Watson AI that takes a body of text from a single author and infers their personality facets.

## Experiment and Results:

We wanted to examine the personality traits of the most successful Stack Overflow users. To do this, we had to define a successful Stack Overflow User. Two metrics were used.

### Two Trial Groups:

- The authors of the highest scoring posts
- Users with the highest reputation



## Analysis

High Openness implies an adventurous or exploratory personality while high neuroticism implies the user has higher insecurity or self consciousness. The low agreeableness seems to be counter-intuitive at first, but ultimately means that the speaker is less likely to be sympathetic. So while most Stack Overflow users probably have sympathy for their fellow developers, they also must formulate a confident and authoritative interaction.

		Secondary Trait								Openness	
		Agreeableness		Conscientiousness		Extraversion		Emotional Range		Openness	
Primary Trait	Agreeableness	High	Low	High	Low	High	Low	High	Low	High	Low
	Conscientiousness	Dependable, responsible, reliable, mannerly, considerate		Stem, strict, rigid		Inconsiderate, impolite, distrustful, uncooperative, thoughtless		Bullheaded, abrupt, crude, combative, thoughtless		Cynical, wary of others, recursive, detached, impulsive	
	Extraversion	Social, energetic, enthusiastic, communicative, vibrant		Rash, uncooperative, unreliable, distrustful, thoughtless		Alert, firm, purposeful, competitive		Unruly, boisterous, reckless, devil-may-care, demonstrative		Guarded, pessimistic, secretive, cowardly	
	Emotional Range	Optimistic, forward-looking, domineering, boastful, bossy		Skeptical, serious, discreet, cautious, principled		Boisterous, mischievous, exhibitionistic, gregarious, demonstrative		Extravagant, wordy, talkative, uninhibited, courageous		Confident, bold, assertive, spontaneous, witty	
	Openness	Emotional, garrulous, affectionate, sensitive, soft		Temperamental, quarrelsome, impatient, grumpy		Particular, high-strung, nosy, self-indulgent, extravagant		Guarded, pessimistic, secretive, cowardly		Expressive, wordy, talkative, impulsive, self-examining	
		Patient, relaxed, understanding, down-to-earth		Unreliable, non-existent, unaffectionate, passionless		Restrained, serious, discreet, cautious, principled		Unassuming, wearisome, indefatigable		Tranquil, sedate, placid, impartial, unassuming	

The results from this study can open new insights into personality types for developers. Stack Overflow exists in a space between professional and casual communication and offers a unique platform to study the personality and emotions of developers. Future study opportunities include a more industry-specific natural language processor and further analysis of the Personality Insights data gathered.

**Find out your own Big Five Personality Facets:**

