

“A better system for evaluating brand consistency between shows and networks”

Background:

It is an accepted rule in the television world that when it comes to networks, brand consistency is vital. In the past year, I have had an internship at both a Reality TV production company as well as an Indy Film distribution company. While some of their sales go to streaming services and DVD, the majority of content is still traditionally broadcast on networks. Time and time again, they would pitch their content to buyers only to be told that the pitched content did not fit with the network's brand. I theorized that if you could take the subjectivity out of comparing the brand of pitched content to the brand of a network and make the comparison more objective, distributors and buyers could make better brand matches and ensure brand consistency. My first idea was to make a Myers-Briggs type test, but after research, learned that people have tried and failed for years to identify the 'personality' of a brand through a written test. I thought if I could use something like the Netflix recommender algorithm or the Amazon recommender algorithm to compare different content with an array of attributes, I could take the human element out of the entire equation. While building an entire learning machine would prove difficult, I theorized a way to simplify the process and compare the attributes of a show to the attributes of all the shows from a single network. By doing this, I could identify how well the content of a proposed show fits the brand of a network without even having to identify the brand in the first place.

Method:

Multi-criteria recommender engines were studied because they are used to compare multiple items each containing multiple attributes to a single item. Because recommender systems are incredibly complex, the main processes of defining a decision, creating a family of criteria, developing a global preference model, and synthesizing a decision were broken out and simplified. An algorithm was made to mimic this type of recommender engine in a more simplistic and slightly less accurate way. The primetime lineups of three networks were recorded. Each show was split up into the same 25 attributes (18 ordinal attributes and 7 nominal attributes). Each of those attributes for every show and the three networks (CBS, Comedy Central, NBC) were rated from a scale of 1-10 by three people and averaged to integer values. With the combined values of all of the shows in a network and each of their attributes, a matrix was formed. Random shows from each of the network's primetime lineups were extracted so that they could be compared against the three networks for brand similarity. Multiple algorithms were tested through trial and error until a single formula for brand similarity between a single show and a network was created. The final formula for similarity from a scale of 1-100 is to take the absolute value of the difference between each attribute of the show being compared and the network's show, then find the sum of all of those differences for each show, then add those sums for all the shows in that network, then divide that

total by the number of shows in that network, then take that value and subtract 50, then subtract that number from 100.

| Network | Show | Subjective (Ordinal) | | | | | | | | | | Objective (Nominal) | | | | | | | | | | | | | | |
|------------------|-----------------------------|----------------------|-------|---------|--------|-------|--------|------------|-----------|------------|--------------|---------------------|----------------|------|-------------|--------|-----------|----------|-------------|---------|-----------|------|--------------------|--------|---------------|---|
| | | Comedy | Drama | Fantasy | Action | Crime | Serial | Crematogry | Sexuality | Quirkiness | Intellectual | Male Focuser | Female Focuser | Kids | Young Adult | Adults | Political | Thriller | Originality | Cartoon | Half hour | Hour | Documentary Sketch | Sitcom | Modocumentary | |
| CBS | Big Bang Theory | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 7 | 3 | 5 | 5 | 2 | 4 | 4 | 1 | 1 | 3 | 1 | 1 | 7 | 1 | 1 | 10 | 1 |
| | Great Indoors | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 5 | 3 | 2 | 5 | 1 | 3 | 6 | 1 | 1 | 3 | 1 | 7 | 1 | 1 | 10 | 1 | |
| | Mom | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 7 | 2 | 2 | 5 | 2 | 3 | 6 | 1 | 1 | 3 | 1 | 7 | 1 | 1 | 10 | 1 | |
| | Life in Pieces | 9 | 3 | 1 | 1 | 1 | 1 | 5 | 1 | 3 | 5 | 6 | 5 | 1 | 2 | 7 | 1 | 1 | 6 | 1 | 7 | 1 | 1 | 10 | 1 | |
| | Criminal Minds | 2 | 7 | 1 | 4 | 10 | 1 | 2 | 2 | 2 | 7 | 5 | 5 | 1 | 1 | 8 | 1 | 6 | 3 | 1 | 1 | 7 | 1 | 1 | 1 | 1 |
| | MADgiver | 3 | 2 | 2 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 4 | 1 | 2 | 7 | 1 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Hawaii Five-0 | 1 | 7 | 1 | 10 | 9 | 1 | 1 | 1 | 6 | 1 | 6 | 4 | 1 | 2 | 7 | 1 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | NCSI: LA | 1 | 7 | 1 | 5 | 10 | 1 | 1 | 1 | 1 | 1 | 5 | 6 | 4 | 1 | 8 | 3 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 48 Hours | 1 | 7 | 1 | 1 | 9 | 1 | 1 | 2 | 1 | 1 | 9 | 6 | 4 | 1 | 8 | 3 | 6 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| | Madam Secretary | 2 | 10 | 1 | 1 | 1 | 1 | 7 | 4 | 7 | 1 | 6 | 3 | 7 | 1 | 7 | 10 | 3 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| | Elementary | 2 | 5 | 1 | 1 | 5 | 9 | 1 | 5 | 6 | 1 | 5 | 5 | 1 | 1 | 8 | 1 | 7 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| | Kevin Can Wait | 10 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 6 | 4 | 1 | 2 | 7 | 1 | 1 | 1 | 1 | 7 | 1 | 1 | 10 | 1 | 1 |
| | Man With a Plan | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 2 | 1 | 6 | 4 | 1 | 2 | 7 | 1 | 1 | 1 | 7 | 1 | 1 | 10 | 1 | 1 |
| | 2 Broke Girls | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 9 | 2 | 1 | 5 | 5 | 1 | 5 | 4 | 1 | 2 | 1 | 7 | 1 | 1 | 10 | 1 | 1 |
| | NCSI: New Orleans | 1 | 7 | 1 | 1 | 5 | 10 | 1 | 1 | 1 | 1 | 5 | 6 | 4 | 1 | 8 | 3 | 6 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 |
| Scorpion | 3 | 7 | 1 | 1 | 4 | 9 | 3 | 2 | 2 | 5 | 3 | 6 | 4 | 1 | 8 | 2 | 7 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | |
| Comedy Central | South Park | 10 | 1 | 1 | 1 | 1 | 1 | 7 | 2 | 6 | 3 | 8 | 9 | 1 | 8 | 1 | 7 | 2 | 9 | 1 | 7 | 1 | 1 | 1 | 1 | |
| | Chappelle's Show | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 6 | 8 | 2 | 1 | 8 | 1 | 5 | 1 | 2 | 1 | 7 | 1 | 1 | 10 | 1 | |
| | Key & Peele | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 3 | 5 | 3 | 7 | 8 | 1 | 3 | 1 | 8 | 1 | 7 | 1 | 1 | 10 | 1 | |
| | Broad City | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 10 | 6 | 3 | 7 | 1 | 8 | 1 | 4 | 1 | 10 | 1 | 7 | 1 | 1 | 1 | 1 | |
| | Detroiters | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 5 | 8 | 3 | 6 | 4 | 1 | 1 | 1 | 1 | 5 | 1 | 7 | 1 | 1 | 1 | 1 | |
| | Drunk History | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 3 | 9 | 9 | 5 | 3 | 5 | 2 | 7 | 1 | 10 | 1 | 7 | 1 | 5 | 1 | 1 | |
| | Inside Amy Schumer | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 10 | 8 | 5 | 3 | 7 | 1 | 3 | 1 | 8 | 1 | 7 | 1 | 1 | 10 | 1 | 1 | |
| | Jeff & Some Aliens | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 6 | 9 | 2 | 7 | 3 | 1 | 8 | 1 | 7 | 1 | 10 | 1 | 1 | 1 | 1 | 1 | |
| | Kroll Show | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 7 | 8 | 5 | 5 | 1 | 8 | 1 | 1 | 1 | 8 | 1 | 7 | 1 | 1 | 1 | 1 | |
| | Legends of Chumbain Heights | 10 | 1 | 1 | 1 | 1 | 1 | 5 | 2 | 7 | 7 | 1 | 9 | 1 | 1 | 8 | 1 | 1 | 9 | 1 | 10 | 1 | 1 | 1 | 1 | |
| | Reno 911 | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 9 | 10 | 1 | 7 | 3 | 1 | 8 | 1 | 3 | 1 | 6 | 1 | 7 | 1 | 1 | 1 | |
| | Workaholics | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 9 | 7 | 1 | 9 | 1 | 1 | 8 | 1 | 1 | 7 | 1 | 7 | 1 | 1 | 1 | 1 | |
| | NBC | Blacklist | 1 | 8 | 3 | 7 | 9 | 1 | 6 | 2 | 1 | 6 | 5 | 5 | 1 | 1 | 8 | 6 | 9 | 2 | 1 | 7 | 1 | 1 | 1 | 1 |
| | | Chicago Fire | 1 | 10 | 1 | 1 | 7 | 2 | 5 | 2 | 7 | 1 | 2 | 5 | 5 | 1 | 3 | 6 | 2 | 7 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Chicago Justice | 1 | 10 | 1 | 1 | 10 | 5 | 2 | 5 | 1 | 6 | 5 | 5 | 1 | 3 | 6 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Chicago Med | | 1 | 10 | 1 | 3 | 1 | 5 | 2 | 7 | 1 | 6 | 5 | 5 | 1 | 3 | 6 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Chicago P.D. | | 1 | 10 | 1 | 7 | 10 | 5 | 2 | 5 | 1 | 5 | 5 | 5 | 1 | 3 | 6 | 5 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Dateline | | 1 | 7 | 1 | 1 | 9 | 1 | 2 | 1 | 1 | 1 | 8 | 5 | 1 | 1 | 8 | 7 | 2 | 1 | 1 | 1 | 7 | 10 | 1 | 1 | |
| The Good Place | | 2 | 8 | 10 | 7 | 1 | 7 | 9 | 5 | 2 | 6 | 3 | 7 | 3 | 4 | 3 | 1 | 8 | 7 | 1 | 7 | 1 | 1 | 1 | 1 | |
| Grimm | | 1 | 7 | 1 | 5 | 10 | 1 | 1 | 1 | 1 | 1 | 5 | 6 | 4 | 1 | 3 | 6 | 3 | 6 | 1 | 1 | 7 | 1 | 1 | 1 | |
| Law & Order: SVU | | 10 | 1 | 9 | 10 | 4 | 5 | 5 | 2 | 8 | 1 | 7 | 3 | 4 | 3 | 3 | 1 | 1 | 10 | 1 | 7 | 1 | 1 | 7 | 1 | |
| Powerless | | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 5 | 7 | 1 | 5 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | |
| Supergirl | | 7 | 10 | 1 | 1 | 1 | 1 | 7 | 9 | 6 | 1 | 7 | 3 | 7 | 1 | 4 | 5 | 5 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | |
| This is Us | | 7 | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 9 | 6 | 1 | 7 | 1 | 4 | 5 | 5 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | |

Figure 1: List of networks, shows, and attributes

Results:

Three shows from each of the networks were compared to all of the networks overall for similarity. In each of the cases, the show was correctly identified as more similar to the brand of their actual network than the others. Shows that were more similar had lower 'difference' values of similarity. Shows that were more similar to the network overall had a higher overall similarity score from a scale of 1-100.

| Network | Show | Total Similarity of Show |
|----------------|---------------------------------------|---|
| NBC | Emerald City | |
| CBS | Big Bang Theory | 92 |
| | Great Indoors | 92 |
| | Mom | 92 |
| | Life In Pieces | 83 |
| | Criminal Minds | 57 |
| | MacGyver | 59 |
| | Hawaii Five-O | 61 |
| | NCIS: LA | 60 |
| | 48 Hours | 83 |
| | Madam Secretary | 58 |
| | Elementary | 57 |
| | Kevin Can Wait | 97 |
| | Man With a Plan | 101 |
| | 2 Broke Girls | 95 |
| | NCIS | 60 |
| | NCIS: New Orleans | 60 |
| Scorpion | 61 | |
| | Raw Similarity with CBS | 77 |
| | Similarity with CBS | 73 |
| Comedy Central | Sout Park | 98 |
| | Chappelle's Show | 107 |
| | Key & Peele | 89 |
| | Broad City | 90 |
| | Detroiters | 87 |
| | Drunk History | 83 |
| | Inside Amy Schumer | 92 |
| | Jeff & Some Aliens | 99 |
| | Kroll Show | 92 |
| | Legends of Chamberlain Heights | 101 |
| | Reno 911 | 107 |
| | Workaholics | 94 |
| | | Raw Similarity with Comedy Central |
| | Similarity with Comedy Central | 47 |
| NBC | Blacklist | 50 |
| | Chicago Fire | 45 |
| | Chicago Justice | 66 |
| | Chicago Med | 45 |
| | Chicago P.D | 52 |
| | Dateline | 81 |
| | The Good Place | 73 |
| | Grimm | 12 |
| | Law & Order: SVU | 56 |
| | Powerless | 74 |
| | Superstore | 86 |
| | This is Us | 48 |
| | Raw Similarity with NBC | 62 |
| | Similarity with NBC | 88 |

Figure 2: Results of *Emerald City's* (NBC) similarity compared to NBC, CC, and CBS

Discussion and Conclusion:

This system, using attributes of shows and a similarity algorithm, is a proof of concept for the theory that comparing specific shows to the overall brand of a network can be successfully compared for similarity. While this is proof that the theory for a computational similarity tool has validity, it is important to not that this is far from a perfect system. Factors including weighted importance of different attributes, the attributes themselves, the type of algorithm used for similarity, and many other factors must be contemplated in the future to make the system more accurate. In addition, more data, including the number of networks and the number of attributes, would be helpful in making the system more accurate. Overall, this system is important to the field of television and television distribution because it takes much of the subjectivity out of deciding whether the brand of a show is consistent enough with the brand of a network.