Generating Hierarchy in Hollywood according to Consumer Preferences

Marlin Figgins, Xingzi Xu, Shashank Dalmia, Aditya Nair

Highlights

Using various features of popular movies, we construct a hierachy from a network of director-actor collaborations. We find the following:

- There appears to be several ways to climb the social hierarchy among actors and directors:
  - Appearing in films with high commercial success.
  - Collaborating with highly ranked individuals.
- Academy awards can carry weight in determining success in this hierarchy but it is difficult to better one's ranking without consumer buy-in.

Background

We are interested in exploring the relationship between consumer preferences and directors/actors and to potentially predict the how likely a collaboration between a particular actor and director is. Does the likelihood of working together lead to a hierarchy among the directors and actors based on preferences.

Data

We took every lead actor and director from popular movies between 1986 and 2016.

For example, Leonardo DiCaprio, Clint Eastwood, James Cameron ..... There are 2504 actors and 2759 directors.

There are 6,908,536 distinct pairs.

We took all possible combinations between the actors and directors.

For each possible director-actor pair, we took the the difference in their gross movie receipts, votes received, number of comedy movies, Oscar nominations, etc

We calculated 18 features for each pair.

That is over 3.8 billion data points.

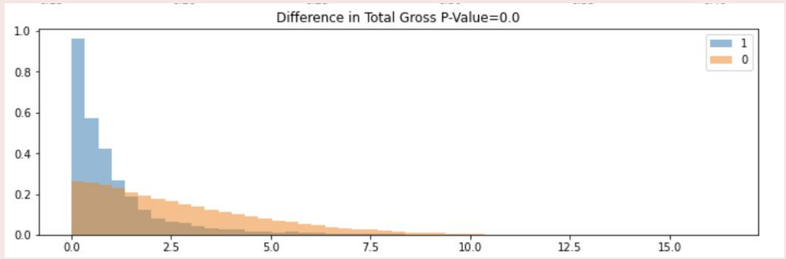
Calculated for each year from 1986 to 2016.

The data is split into two groups: pairs that have actually collaborated and pairs that have not

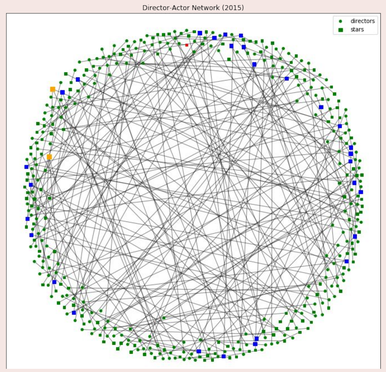
Differences between the groups help use see how the network evolves and how collaborations among agents lead to hierarchy among the actors and directors.

Model

Our model is a time varying network. The nodes in our network are all the actors and directors. A link is formed when an actor and director collaborate. We look across time to see what factors lead to formation of links between nodes to try to predict the probability of a collaboration between an actor and director. The more people wanting to collaborate with an agent, the higher the ranking of the agent.

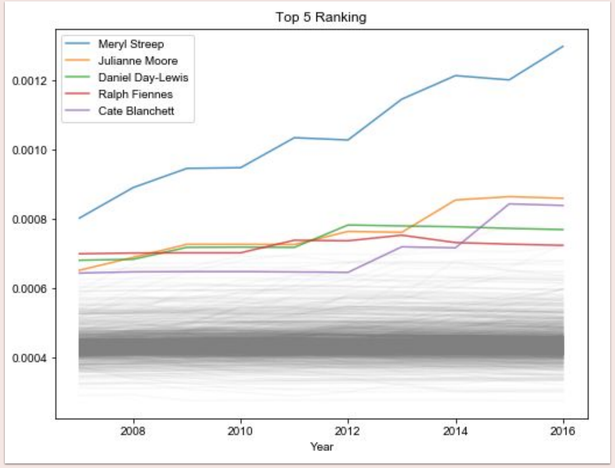


- Directors and Actors that work together have similar gross movie receipts in their lifetimes.
- The pairs that worked together (in blue) have smaller absolute differences i.e. are more closely related in gross receipts than pairs that have not (in orange) .
- Features like these help up predict future collaborations.

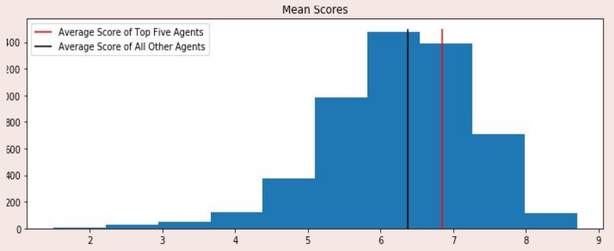


Our graph representation is populated with director-actor relationships, and the image to left is a snapshot of the data from 2015. green, blue, and yellow nodes represent agents that have worked on 1, 2, or 3 movies that year, respectively.

Though prestigious awards like the Oscars can carry weight in determining one's career trajectory, it can prove to be difficult to climb the social ladder in Hollywood without being well-received by consumers.



- Meryl Streep has won three Oscars and holds the record for most Oscar nominations of any actor with 6 over this time period.
- Daniel Day-Lewis does not star in any popular movie after 2012 and stagnates in the rankings.
- Cate Blanchett won an Oscar for Blue Jasmine that sparked her upward ascent in 2013.



The top five agents have, on average, higher IMDB ratings than the rest of the network. These top five are also Oscar nominees and four have won the award.