

# Netflix Graph

Actors community analysis



# DATASET

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The dataset contains 12 different columns, but not all were relevant for our analysis. Here highlighted the main

Title	Director	Cast	Country	Date	Type	Duration
Title of the movie or TV-Series	Name of the director	List of the actors that played a part in the movie/tv series.	The country in which the movie/tv series was produced	Date in which the film was released	Whether it is a movie or a tv-series	Number of seasons/episodes the show lasts

**7.982**

Different movies and TV series with

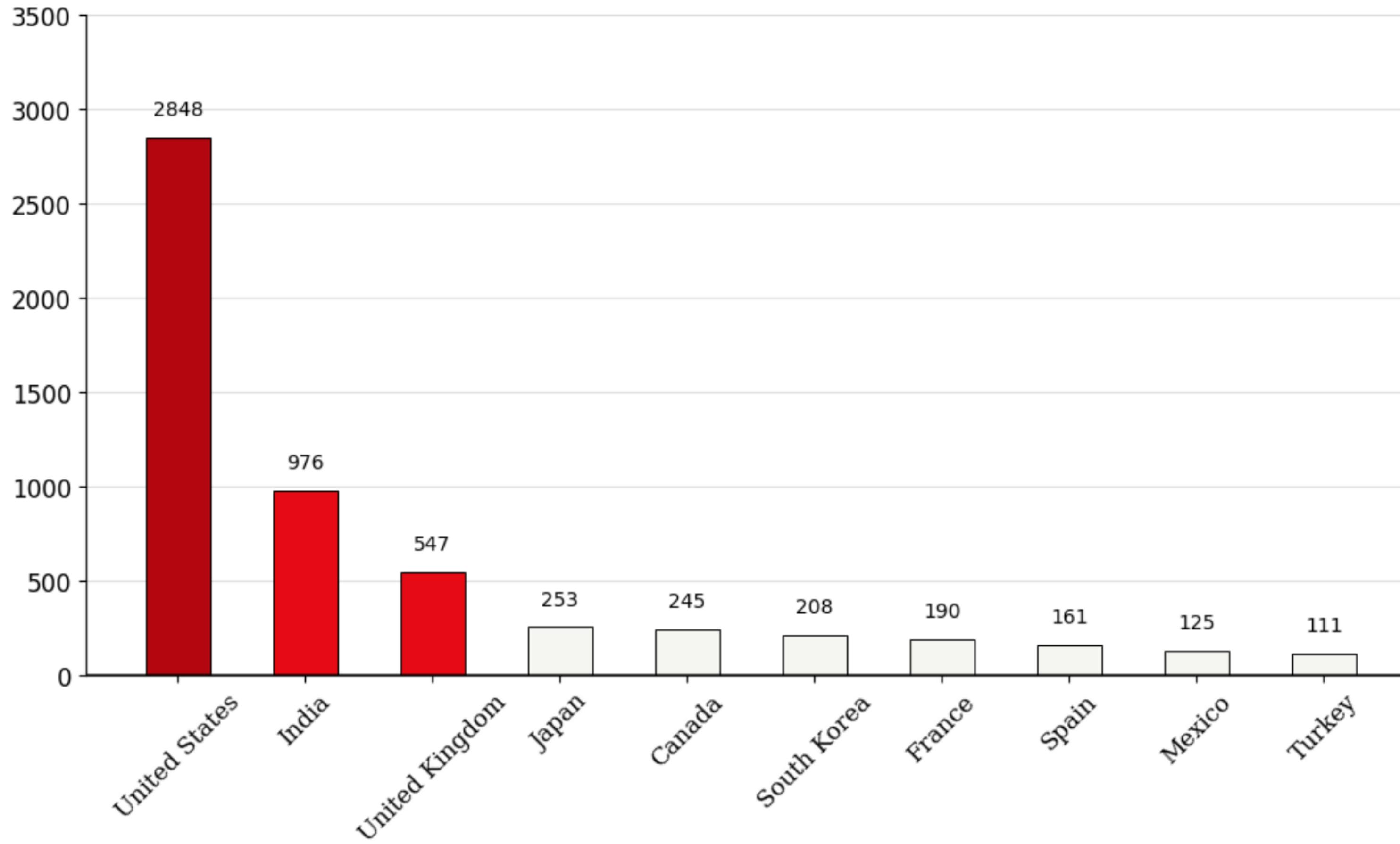
**36.439**

Different actors, coming from

**84**

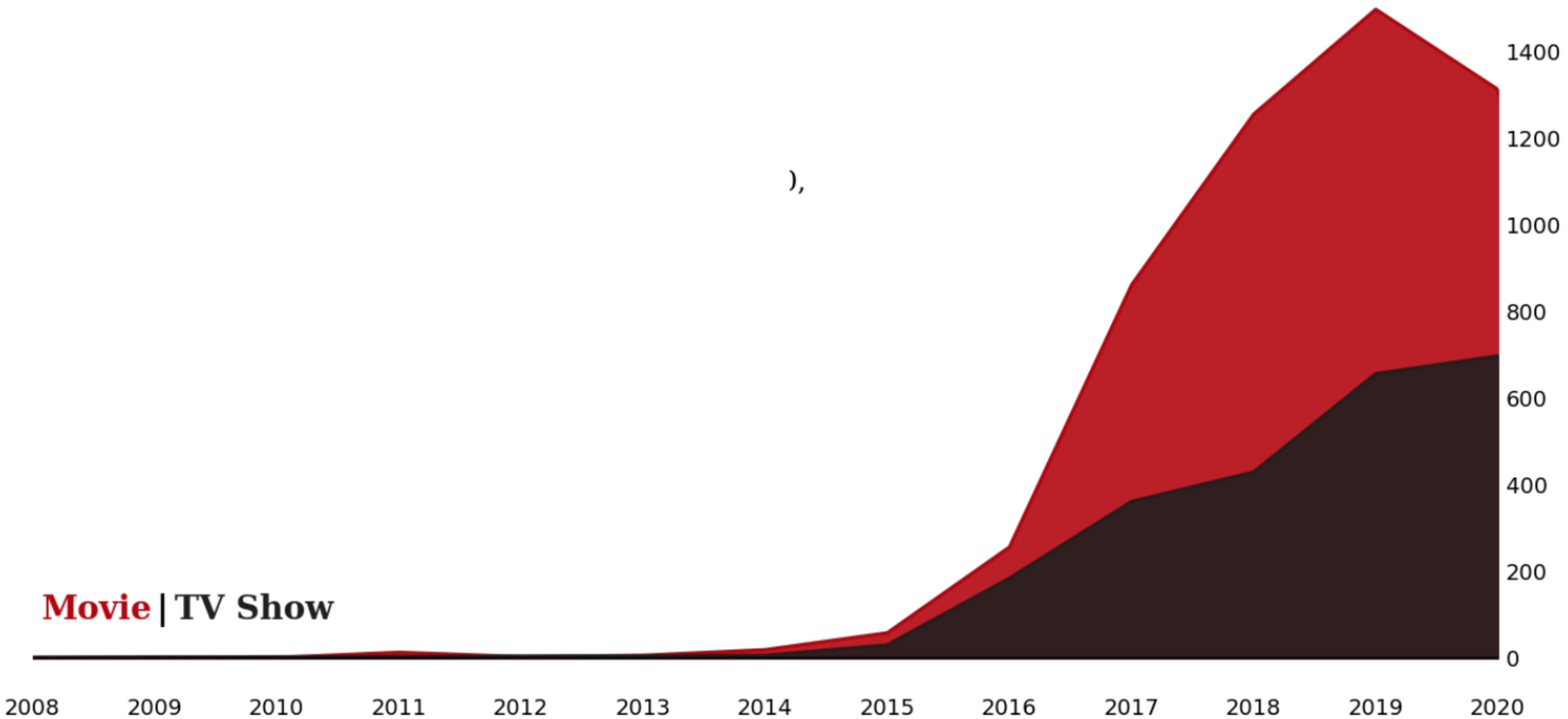
Different countries

# COUNTRIES DISTRIBUTION



# MOVIES AND TV-SHOWS

Added over time



# DATA CLEANING AND GRAPH CREATION

# Graph building

Undirected weighted graph connecting actors if they performed in the same show

## Data cleaning

- 9.7% of “cast” presented NA
- 6.51% of “countries” presented NA

# FIRST “COMPLETE” GRAPH

Problems and solutions

1

2

3

## Statistics

The graph presents **36.439** nodes and a **289.207** weighted edges. The problem is the presence of **874** disconnected components.

## Problems

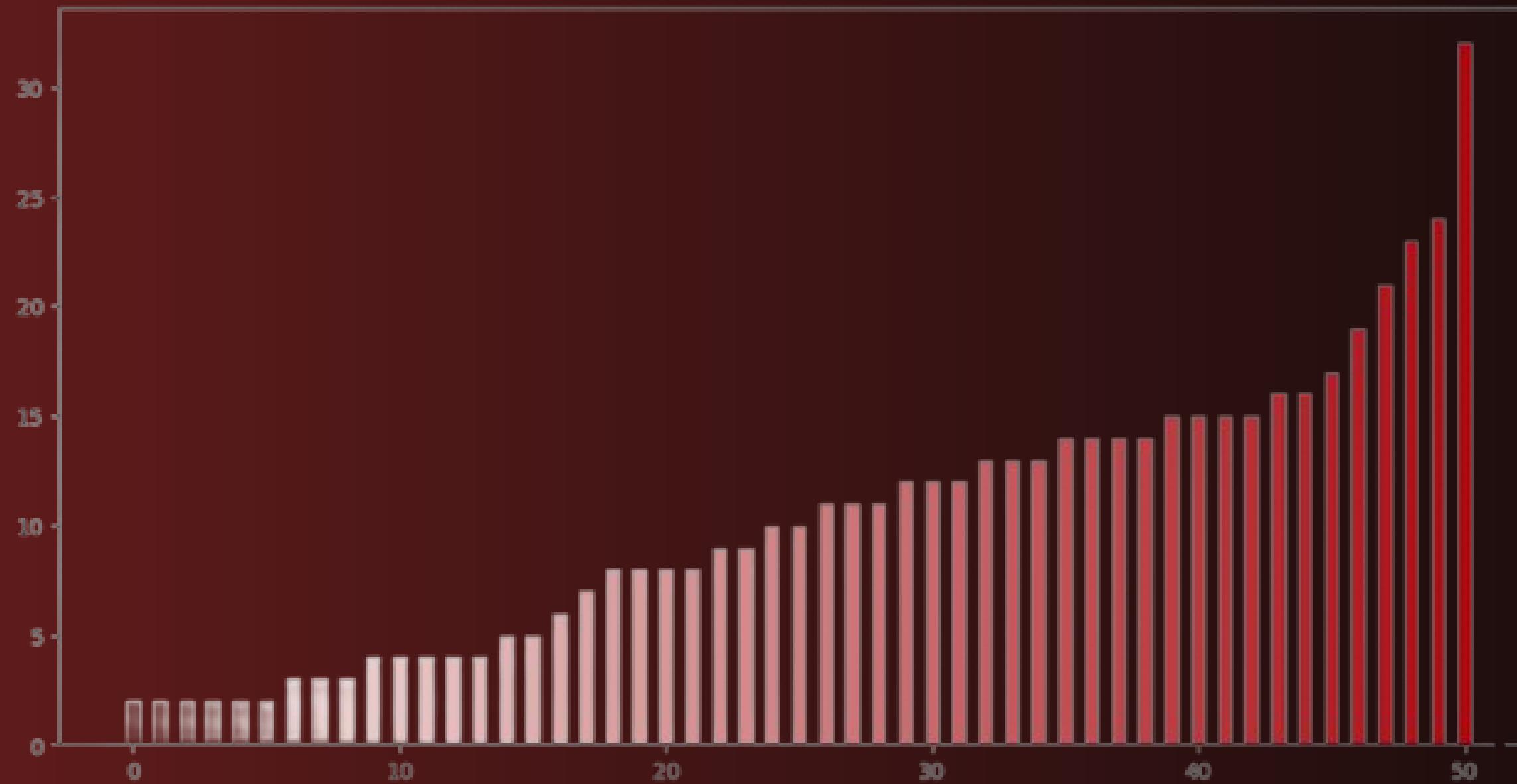
- Films in which only one actor performed: Awake, by **James David**
- All the actors in a cast performed only in that film: **Zuuban**

## Solution

We can remove those actors (**2978**) and obtain a new graph with **33461** nodes and **280378** edges

# Size of 52 components

But the biggest one



The biggest has a total of **32935** nodes  
and **278379** edges

# Best Friends

1. Julie Tejwani - Rupa Bhimani 31
2. Julie Tejwani - Rajesh Kava 24
3. Rupa Bhimani Rajesh Kava 22

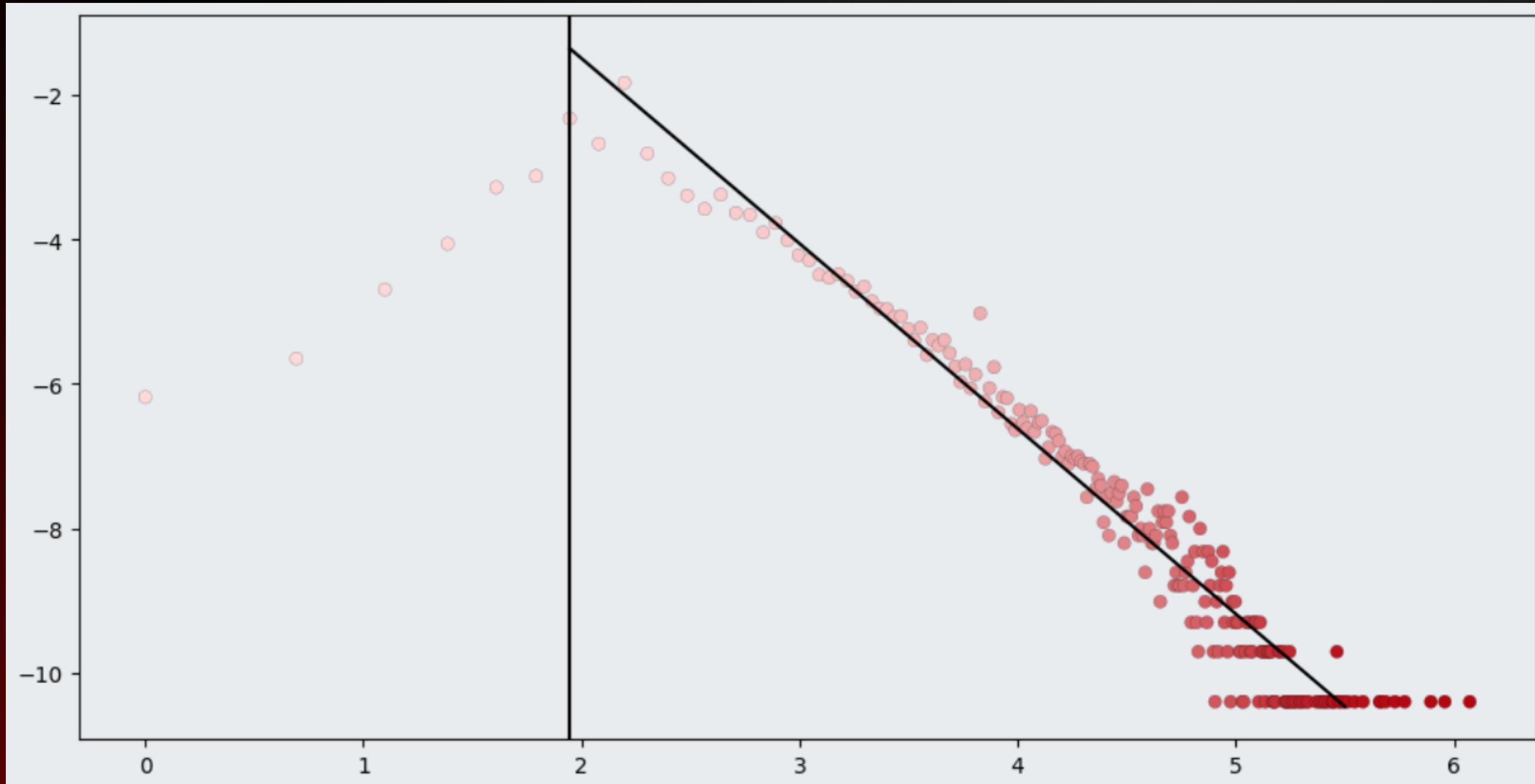
- 
1. Takahiro Sakurai - 43
  2. Yuki Kaji - 387
  3. Anupam Kher - 363
  - .
  - .
  10. Samuel L. Jackson - 256

Most popular



# DEGREE AND PR

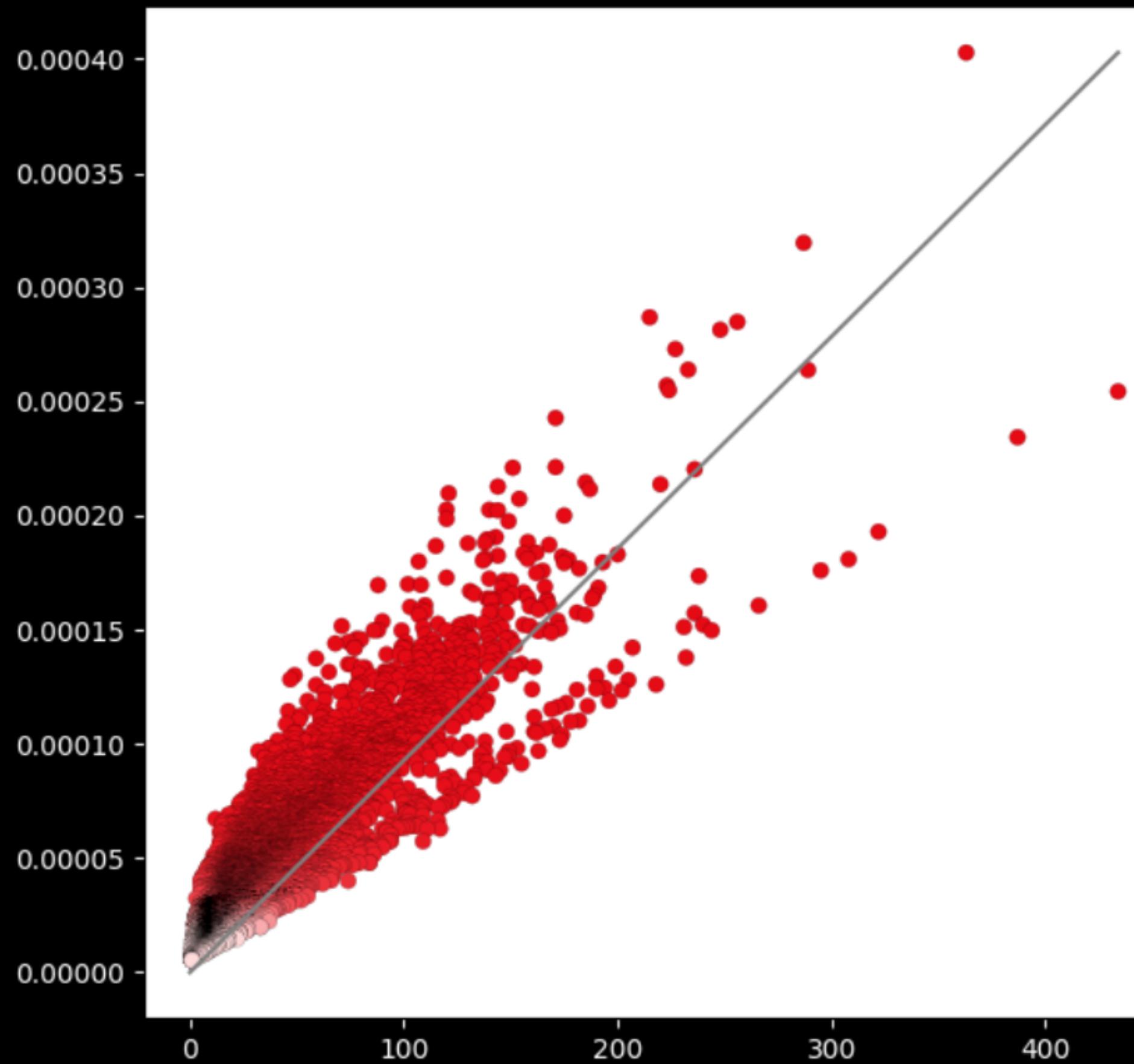
# Degree distribution



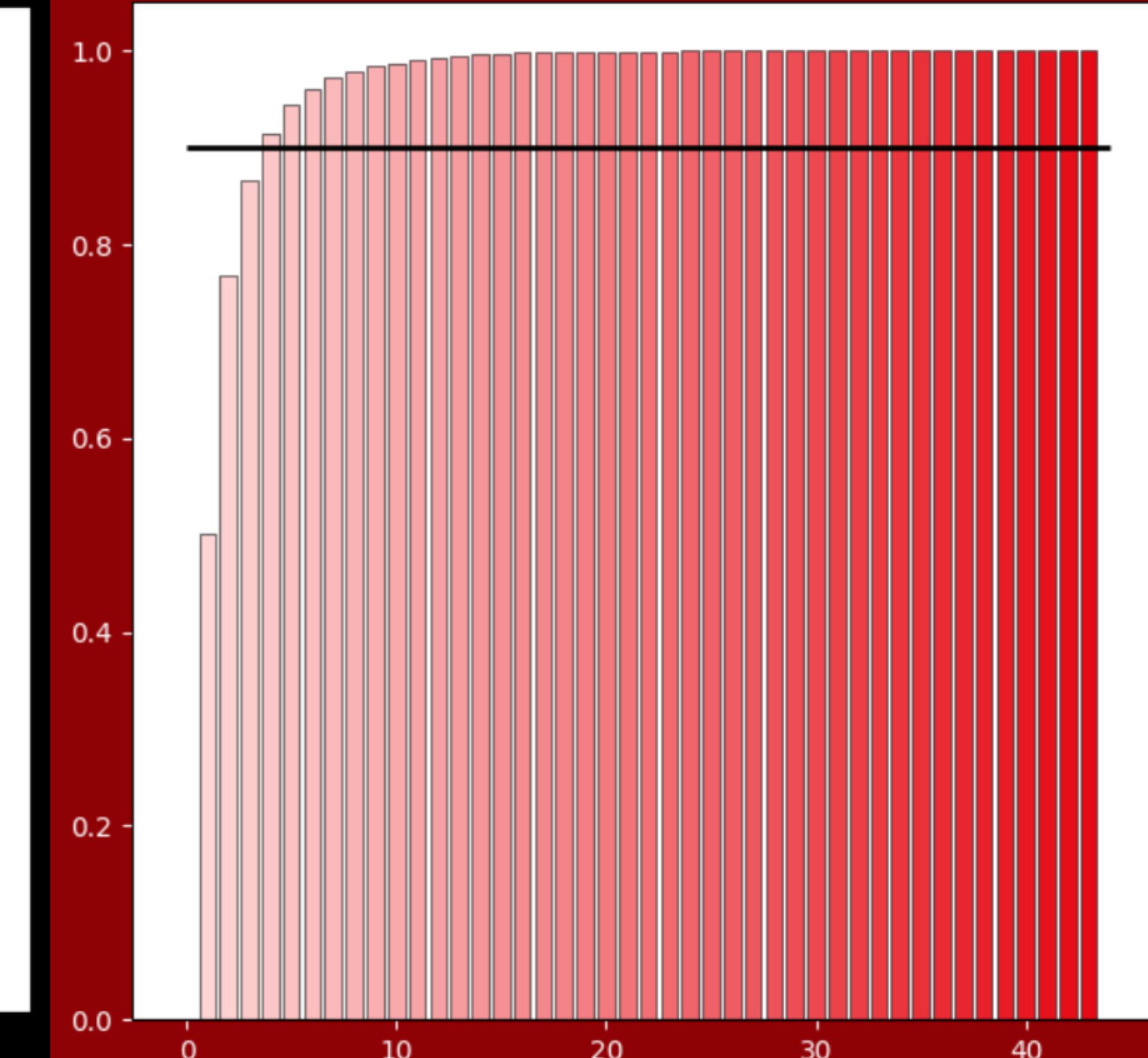
$\gamma = 2.64$ .

-  $K_{min} = 8$

Degree vs. Page Rank



Cumulative distribution of degrees



# Above

1. Anupam Kher
2. Shah Rukh Khan
3. Naseeruddin Shah
4. Samuel L. Jackson
5. Adam Sandler

Degree greater than **200**

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Slope equal to **9.28e-7**

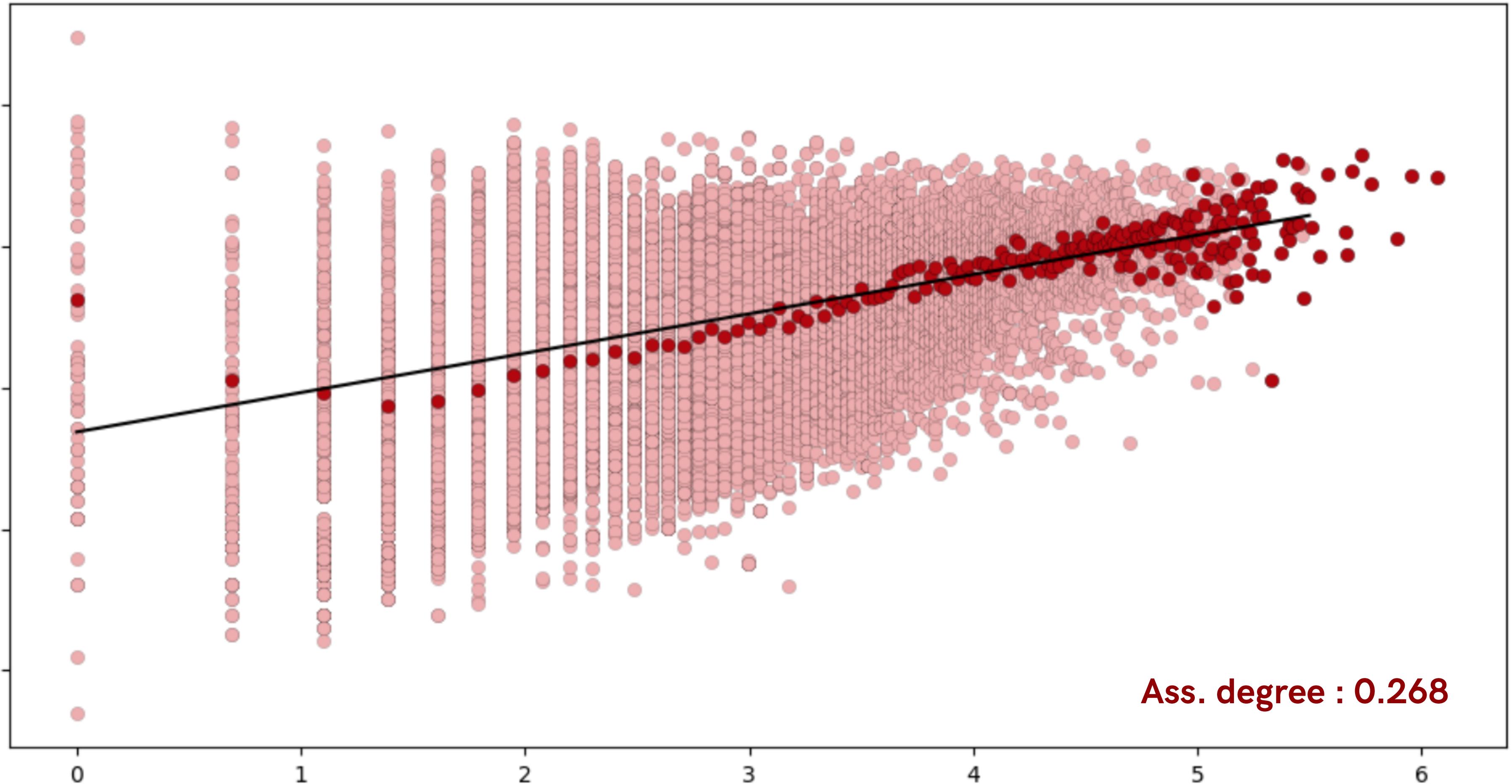
1. Takahiro Sakurai
2. Yuki Kaji
3. Yuichi Nakamura
4. Daisuke Ono
5. Junichi Suwabe

# Below

# ASSORTATIVITY

# Neighboring degree

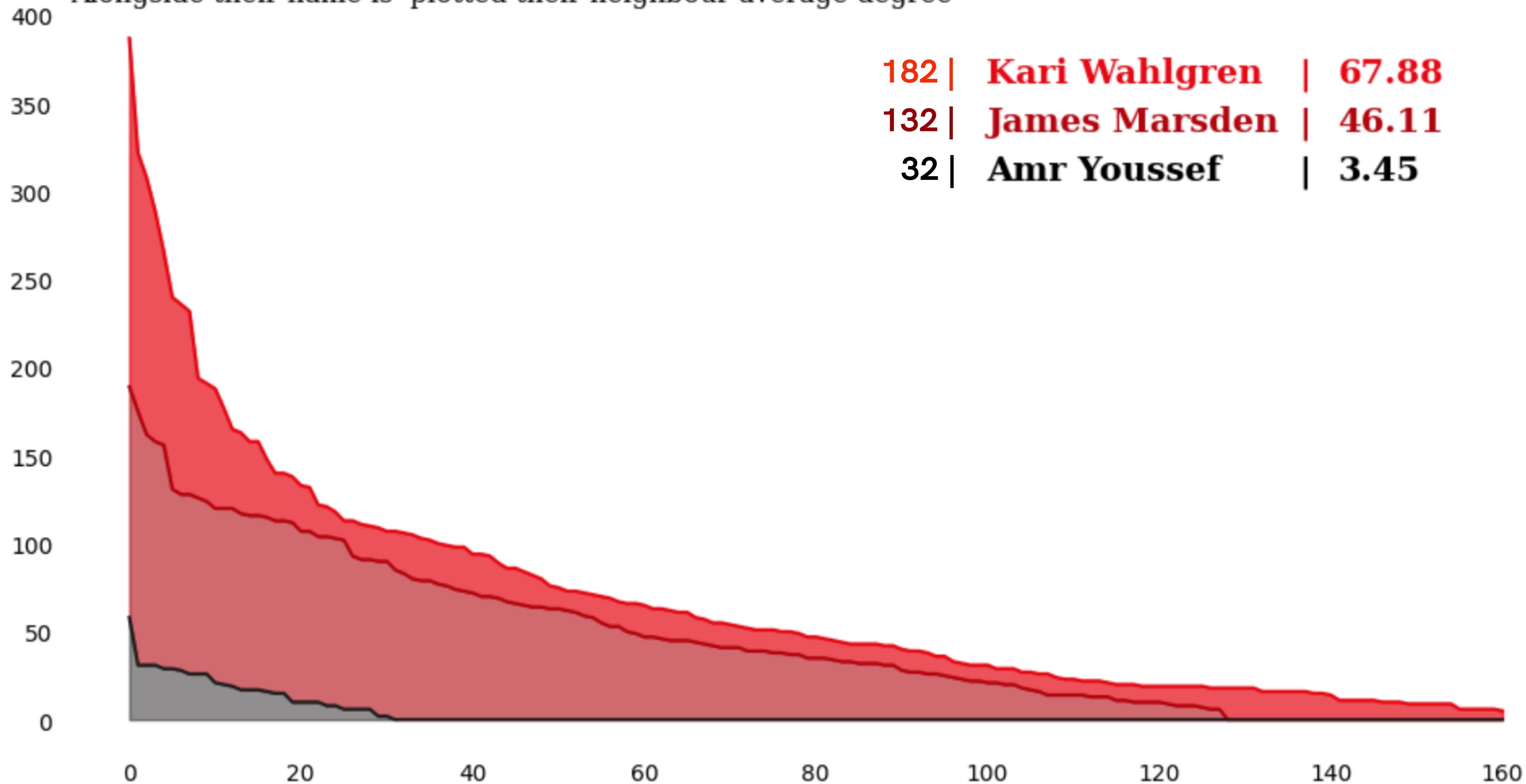
We can spot an assortative behavior in our Network



# **Neighbors degree**

Plotted for 3 different actors with 3 different degrees.

Alongside their name is plotted their neighbour average degree



# COMMUNITY DETECTION

# AGORITHMS AND METRICS

## Louvain

Benchmark algortihm with CV on different resolution values to appease randomicity

## Info-map

Implemented in iGraph to have a comparison with the Louvain results

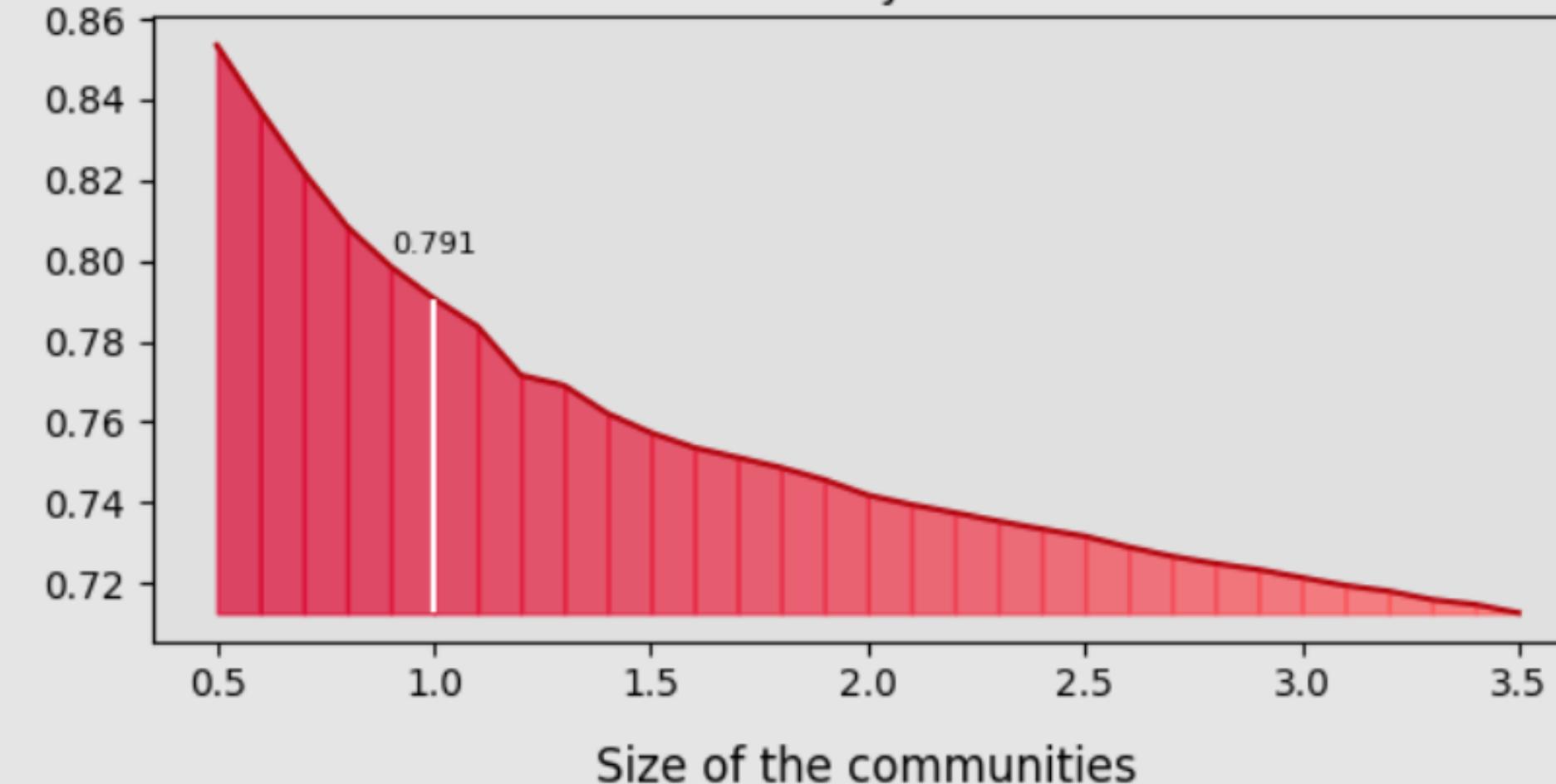
## NMI

To study the statistical independence with different community assignment

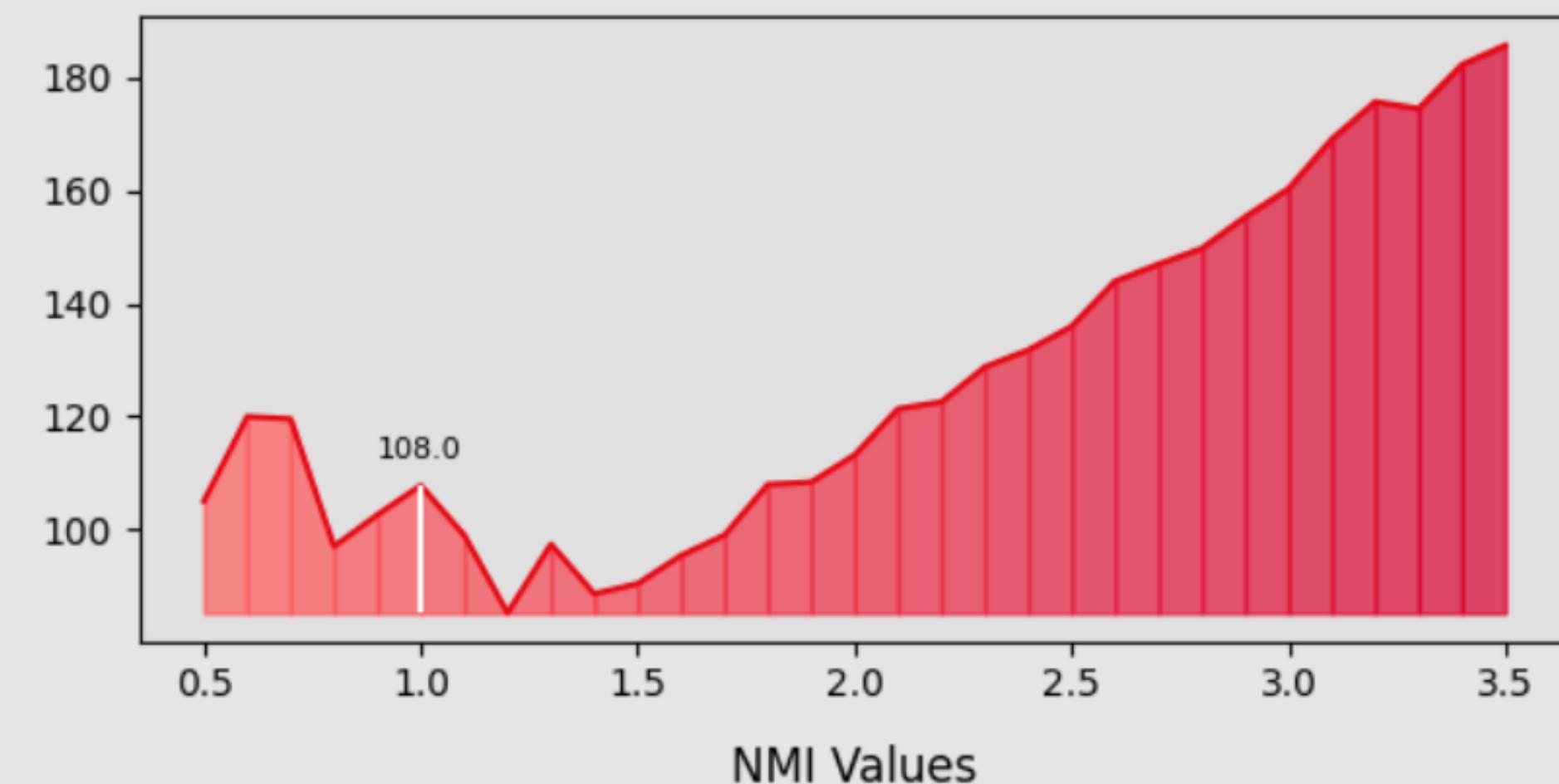
## Modularity

All community assigemnts were compared using modularity

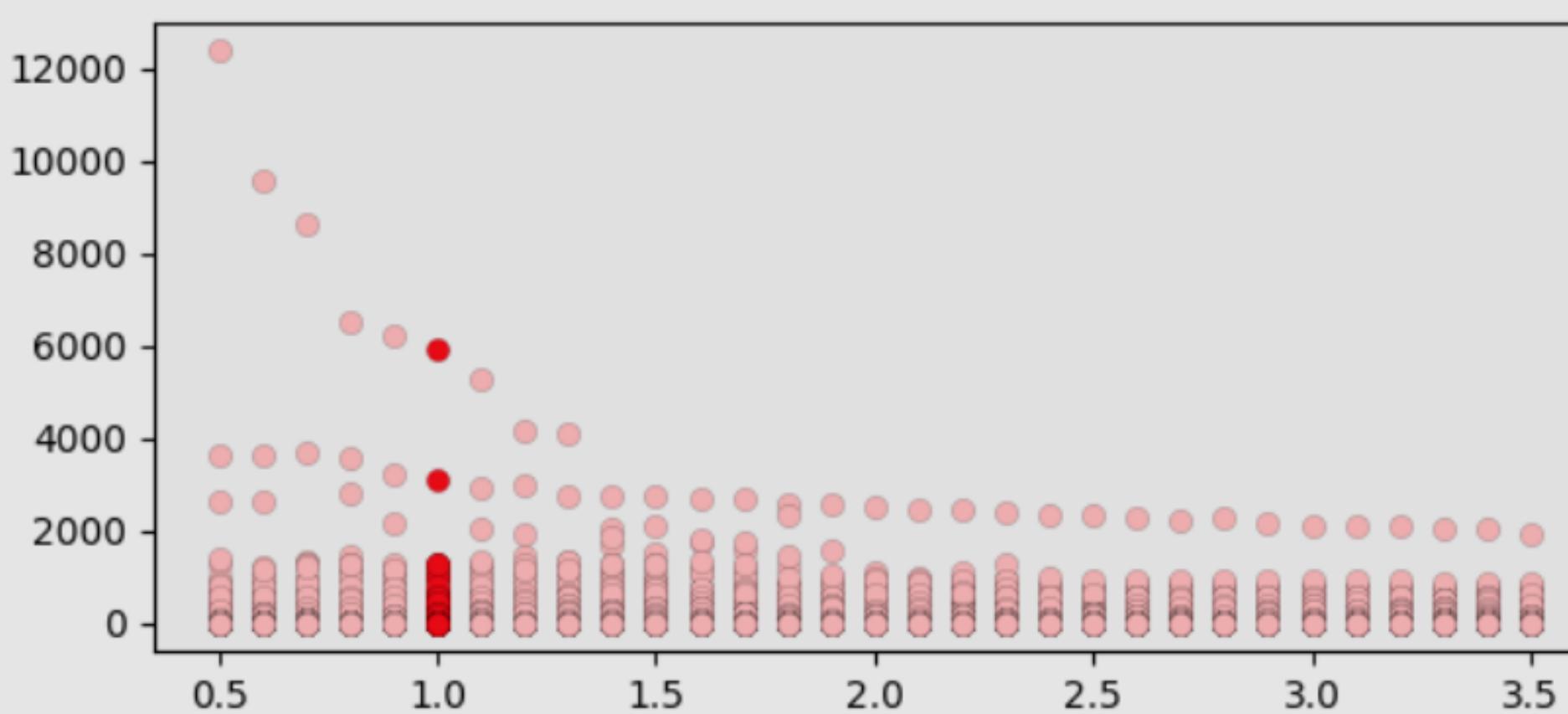
Modularity values



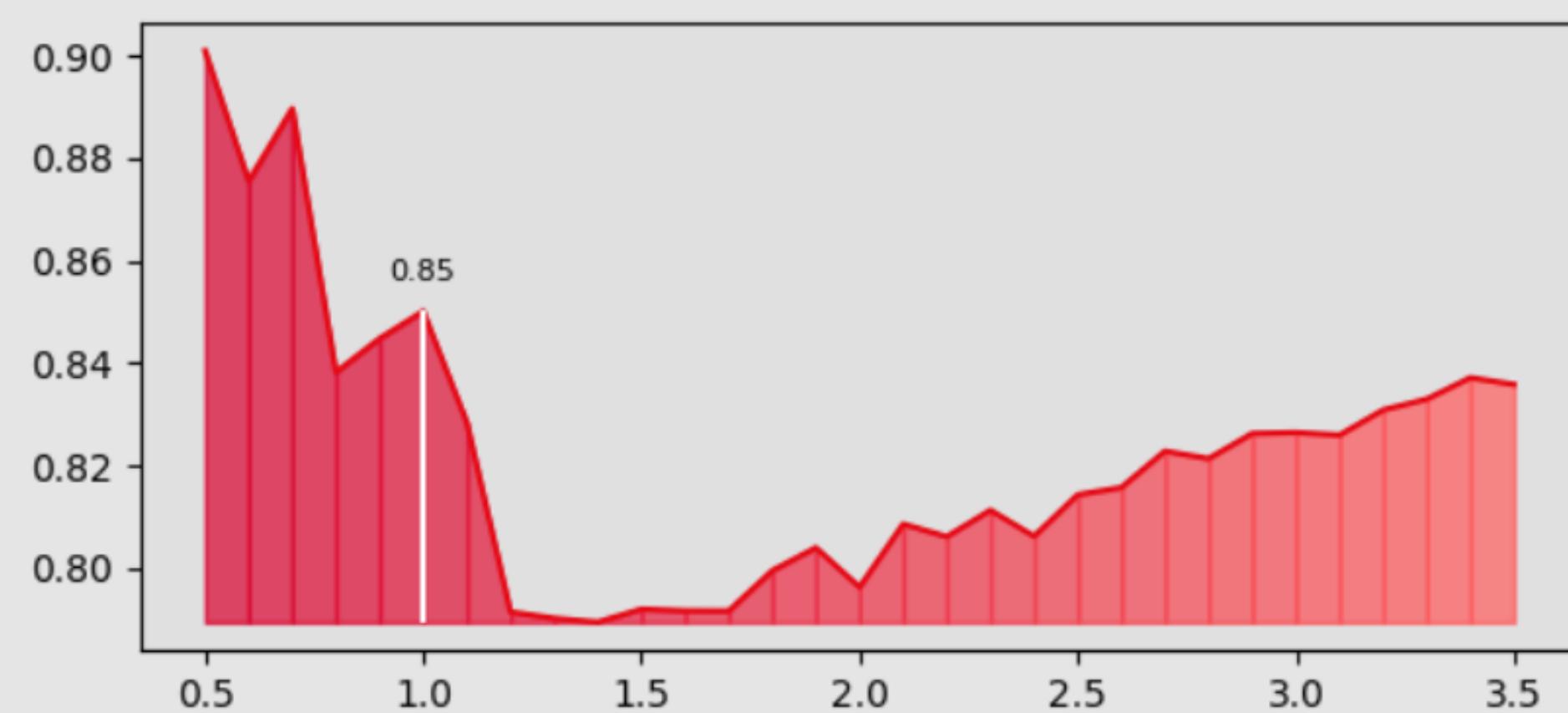
Number of communities



Size of the communities



NMI Values



$\gamma = 1$

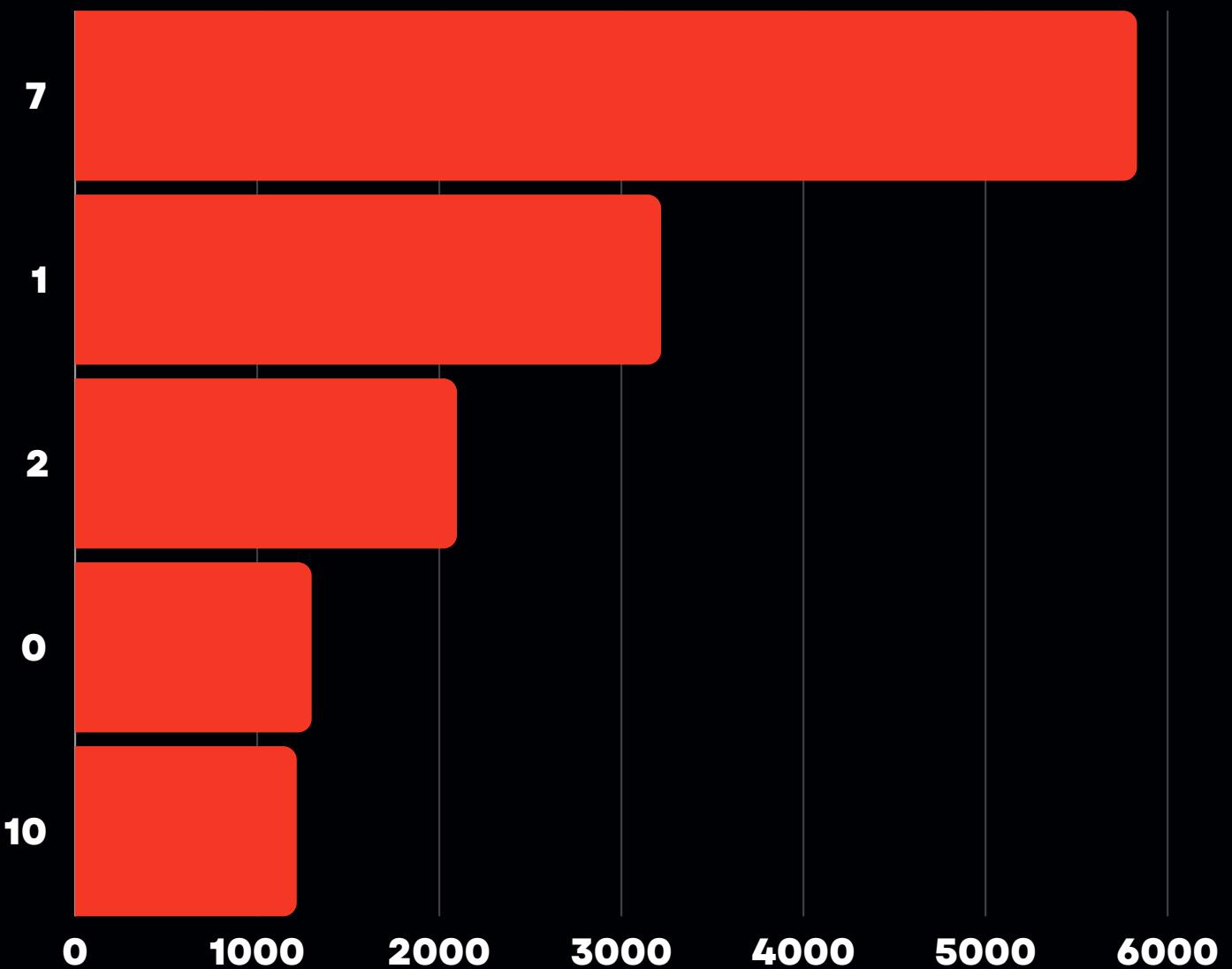
Mod = 0.794

# COMMUNITY ANALYSIS

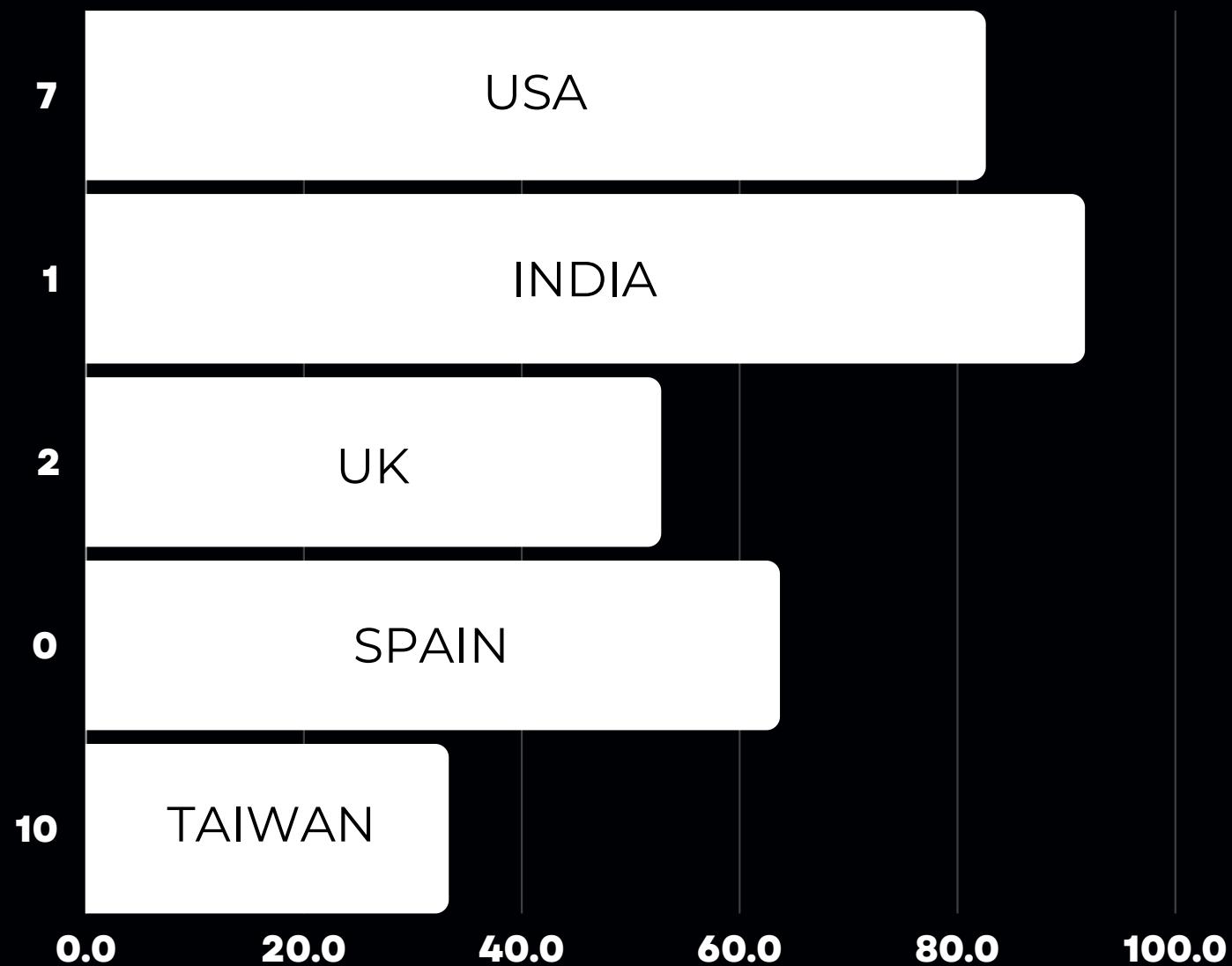
# COMMUNITY ANALYSIS

5 biggest communities and their composition

Size



Nationality



# Some numerical insights

112



Different  
communities

5832



The size of the  
biggest community

36



Communities  
composed by actors  
coming from 1 country

48



Communities in which  
American are  
predominant

1



Community in which  
Italy is the dominant  
country

81



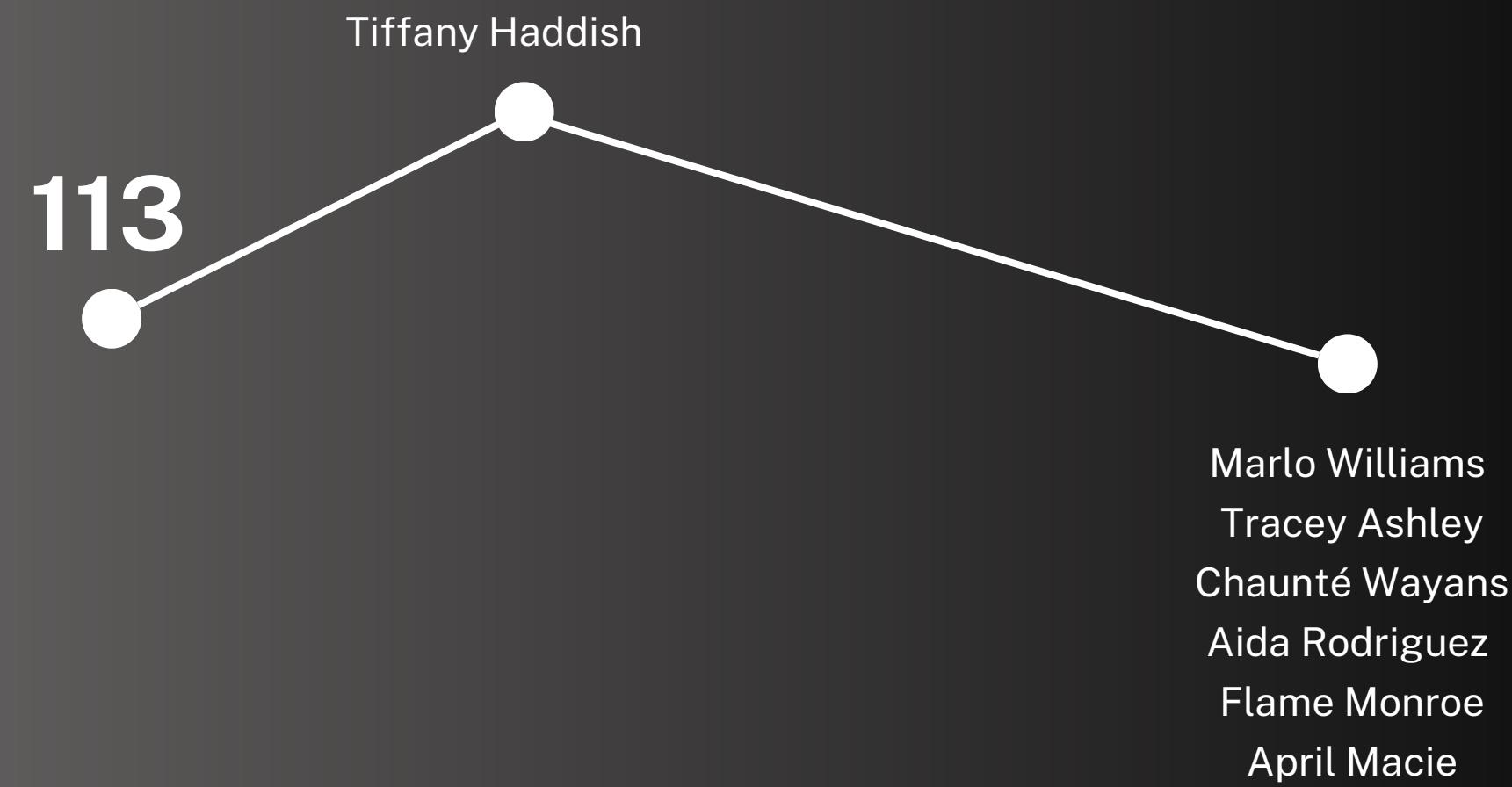
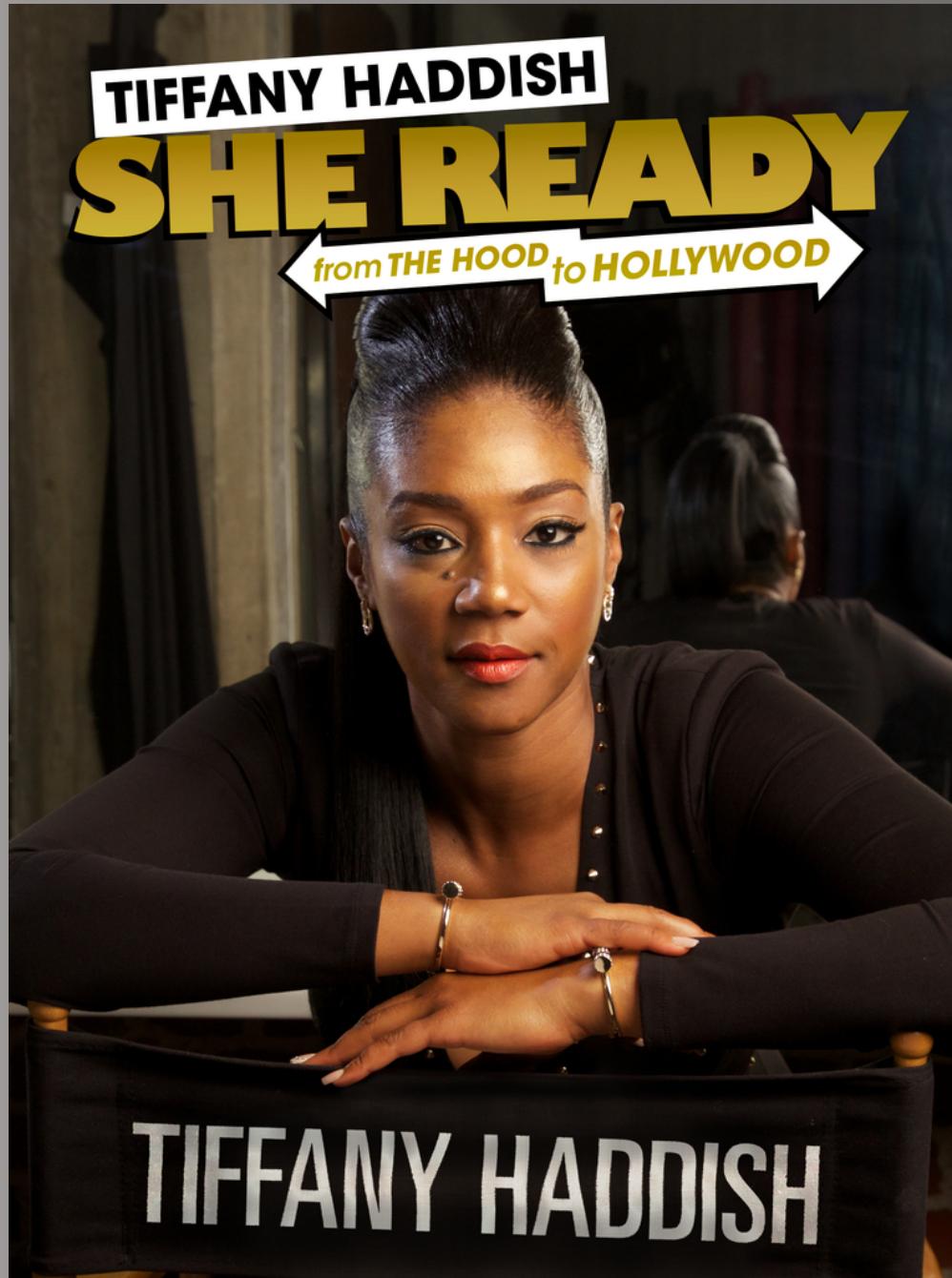
Communities in which  
american actors are  
present

0



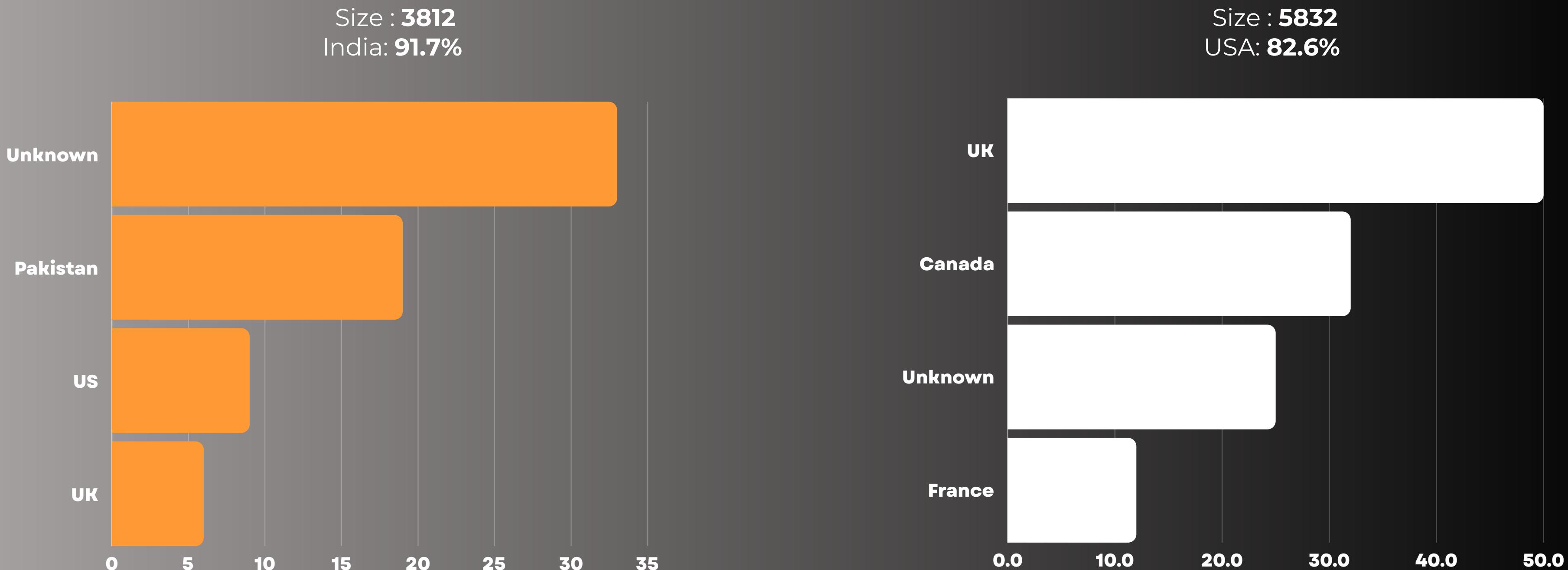
Communities in which  
French are  
predominant

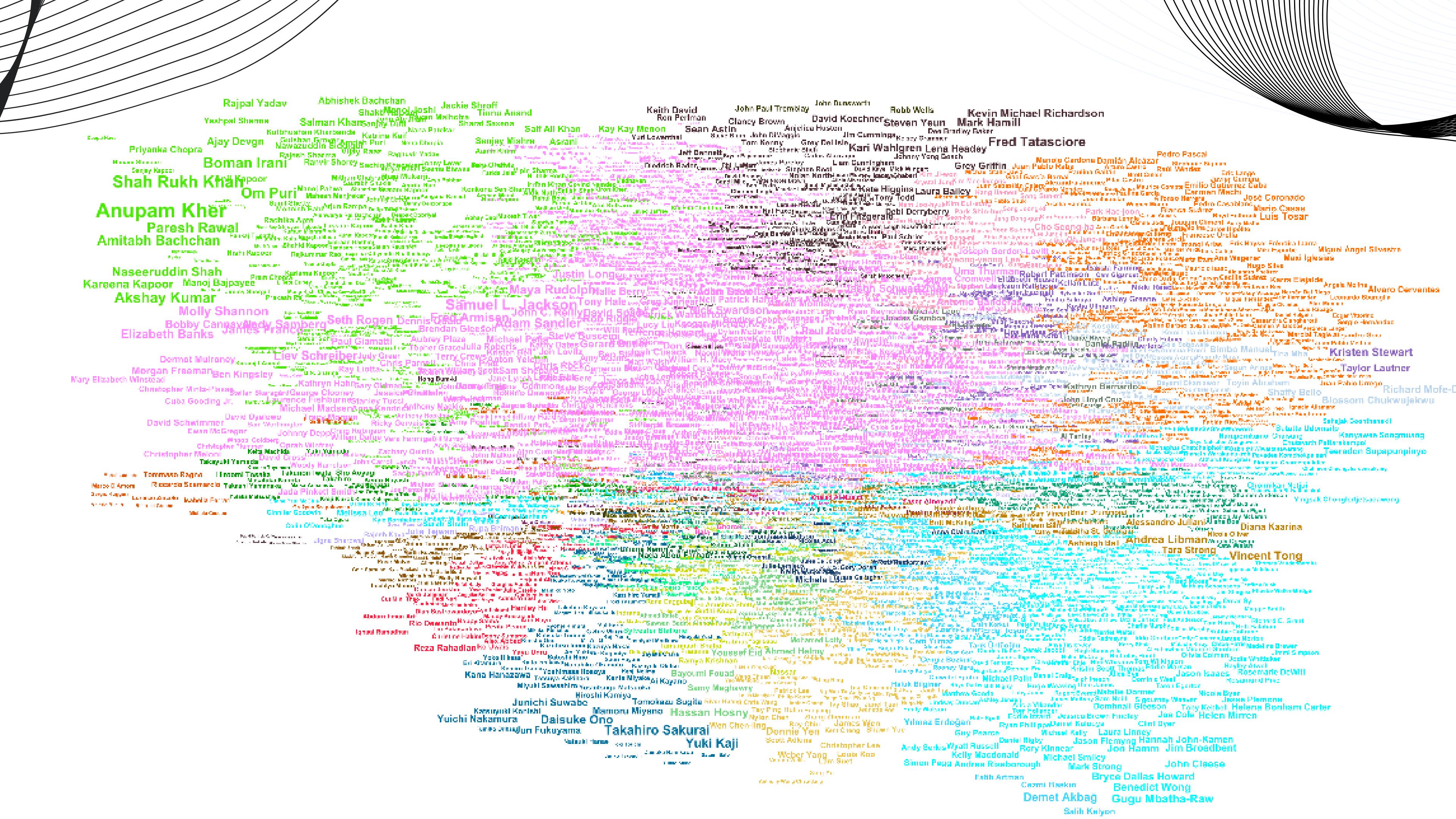
# One-nationality communities



# COMMUNITY ANALYSIS

The 2 biggest communities in our network





Deepki Naval

Rajpal Yadav

Yashpal Sharma

Ajay Devgn

Priyanka Chopra

Himani Shivpuri  
Sanjay Kapoor

Shah Rukh Khan

Milind Kapoor

Amrit Pal

Munish Chaudhury

Anupam Kher

Paresh Rawal

Amitabh Bachchan

Dilip Deshmukh

Rakesh

Sharmi Kapoor

Naseeruddin Shah

Kareena Kapoor Manoj Bajpayee

Holliwood

Akshay Kumar

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Abhishek Bachchan

Manoj Joshi

Shakti Kapoor

John Abraham

Sanjay Dutt

Nan

Kulbhushan Kharbanda

Katrina Kaif

Gulshan Grover

Amrish Puri

Neha Kakkar

Nawazuddin Siddiqui

Rajesh Sharma

Vijay Raaz

Raghuvir

Ranvir Shorey

Sachin Khedekar

Vidya Balan

Mithun Chakraborty

Ranji Mukerjee

Saurabh Shukla

Amrita Singh

Om Puri

Manoj Pahwa

Shraddha Kapoor

Neeram Kapoor

Mahesh Manjrekar

Johnny Lever

Dileep Oberoi

Danny Denzongpa

Sunil Shetty

Mohnish Bahl

Arjun Rampal

Dalip Tahil

Raj Babbar

Aishwarya Rai Bachchan

Deepak Dobriyal

Anupam Arora

Satbir Gulzar

Radhika Apte

Renu Roy

Shreyas Talpade

Tusshar Kapoor

Kader Khan

Kumud Mishra

Bindu

Preity Zinta

Milash Das

Pankaj Tripathi

Brijendra Kala

Bilqasba Basu

Kunal Kapoor

Purab Kohli

Singh

Murli Sharma

Shahid Kapoor

Emraan Hashmi

Raina Pathak

Randeep Hooda

Satish Kaushik

Muhammad Ali

Rishi Kapoor

Rajkummar Rao

Gajraj Rao

Dibyendu Bhattacharya

Smita Jaykar

Aditi Rao Hydari

Amrita Singh

Narendra Jha

Neena Gupta

Tannishtha Chatterjee

Lara Dutta

Vinod Khanna

Sohail Khan

Karisma Kapoor

Siddharth

Nina Kulkarni

Ashish Vidyarthi

Lilitte Dubey

Sarah-Jane Dias

Illeana Douglas

Varun Chawla

Avtar Gill

Bhatt

Manu Rishi Chadha

Karanjeet Singh

Shilendra Mishra

Khuraj Mukherjee

Kishore Kadooka

Mohan Joshi

Mussoor Akhtar

Amira Dastur

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Samuel L. Jackson Tony Hale Greg Kinnear Jason Lee John C. Reilly David Spade Patrick Wall Fred Armisen Adam Sandler Rob Riggle Lucy Liu Keisha Buchanan Gleeson Will Forte Jennifer Tilly Kristen Bell Lucy Liu Kristin Wiig Kristen Wiig Terry Crews Steve Buscemi Gerard Butler Stone Don Cheadle Kristen Bell Jon Lovitz Ben Stiller Cusack Terry Crews Anton Yelchin Amy Adams Matt Walsh William H. Macy Chris Pratt Chris Rock Cameron Diaz Walton Goggins Bertie Higgins Scott Sam Shepard John Goodman Jane Lynch Leslie Bibb Gere James Marsden John Leguizamo Jon Hamm Tina Fey Common Kate Bosworth Alison Brie Rosario Dawson Salma Hayek George Lopez Michael Sheen Kristen Wiig Snowball Jennifer Lopez Gwyneth Paltrow Mary Steenburgen Anna Faris Zach Galifianakis Frank Lando Iffanv Haddish Zach Galifianakis

# STATISTICS COMPARISON

The Indian community present higher Page-Rank and degree values w.r.t. the american actors

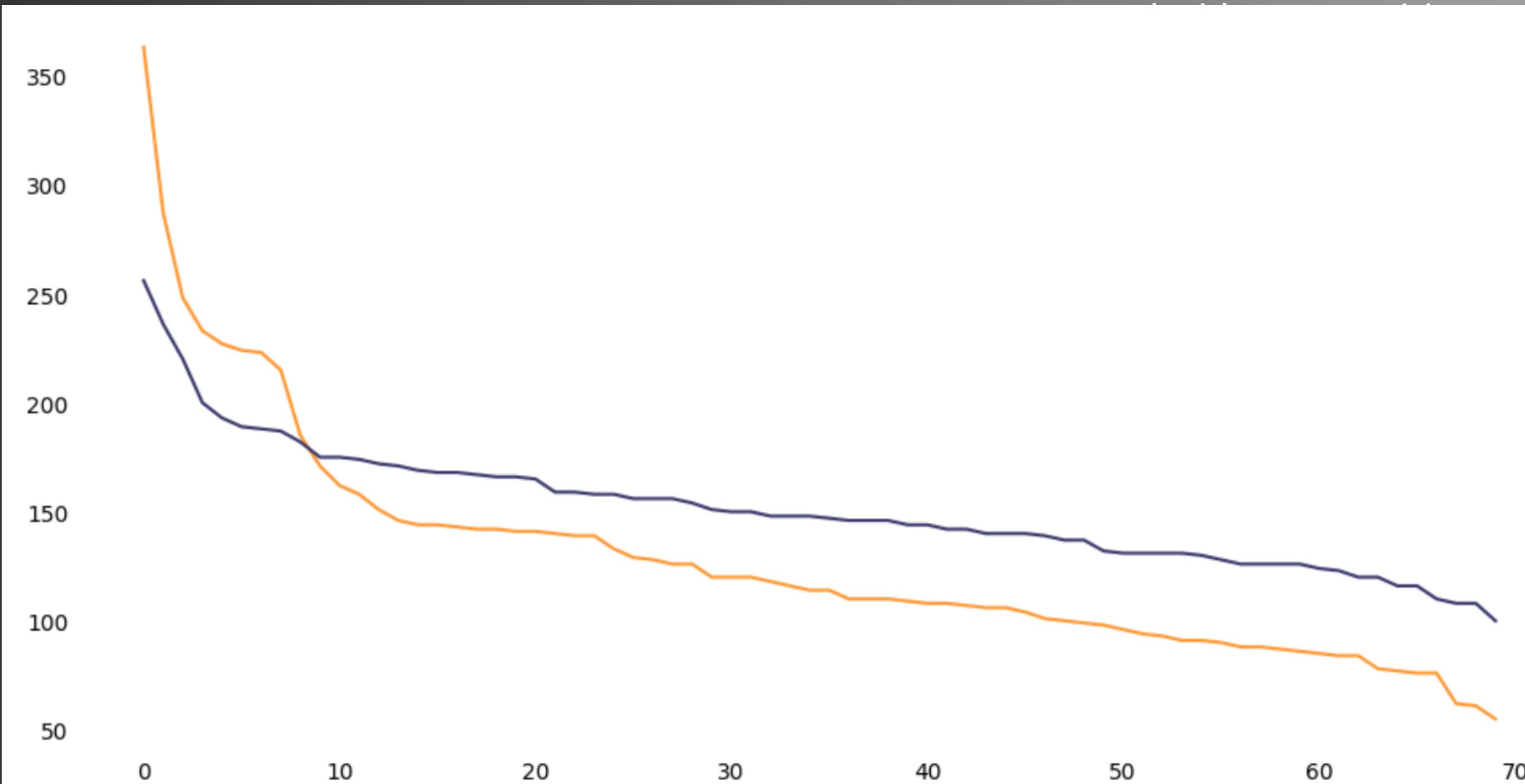
Name	Page-Rank	Degree
Samuel L. Jackson	0.0002848	256
Nicolas Cage	0.0002212	171
Bruce Willis	0.0002210	151
Fred Armisen	0.0002203	236
Adam Sandler	0.0002137	220

Samuel L. Jackson : **24** Films

Name	Page-Rank	Degree
Anupam Kher	0.0004027	363
Shah Rukh Khan	0.0003195	287
Naseeruddin Shah	0.0002868	215
Akshay Kumar	0.00028138	248
Om Puri	0.0002729	227

Anupam Kher : **43** Films

# DEGREE BEHAVIOR



Overtake at  $k = 17$



The background features a dynamic composition of overlapping triangles in various colors. A large triangle in the upper left is filled with a red-to-white gradient. To its right is a green triangle, and below it is a smaller white triangle. The bottom right corner contains a large green triangle, and the bottom left corner has a large red triangle. The overall effect is a sense of depth and movement.

ITALIAN  
COMMUNITY

**370**

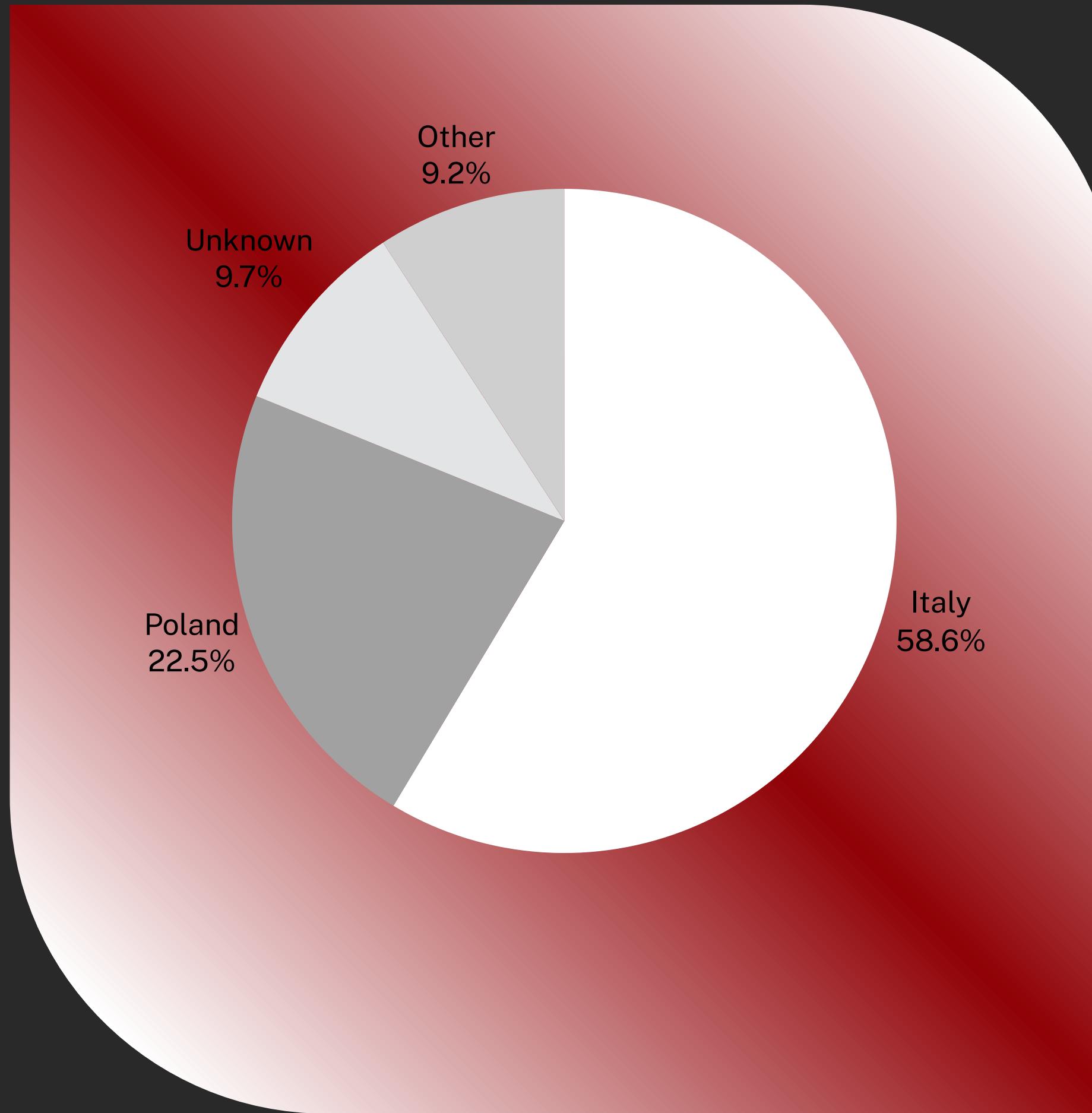
Different actors, coming from

**7**

Different countries, with

**22.57%**

Of actors coming from Poland



# Nations

Composition of the Italian community  
by nationality

# The cause - 365 days

Analysis of the betweenness in the subgraph



Michele Morrone : **0.373**

Grażyna Szapołowska : **0.347**

The background features a dark red and black abstract design with overlapping circular shapes.

Thank you!