import networkx as nx

import pandas as pd

# 创建一个空的无向图

G = nx.Graph()

# 从Excel文件加载数据

excel\_file = "CADVis\_Author.xlsx" # 替换为您的Excel文件路径

df = pd.read\_excel(excel\_file)

# 根据相同的 work\_id 创建节点和边

for work\_id, group in df.groupby("work\_id"):

authors = group["Fullname"].tolist()

order = group["Order"].tolist()

# 添加节点（作者）

for author in authors:

G.add\_node(author) # 添加节点（作者）

# 添加带有作者顺序的边（合作关系）

for i in range(len(authors)):

for j in range(i + 1, len(authors)):

G.add\_edge(authors[i], authors[j], order=order[i]) # 使用order[i]来表示作者顺序

# 创建一个子图，只包括与Marc Aurel Schnabel相关的节点和边

subgraph = G.subgraph(["Marc Aurel Schnabel"] + list(G.neighbors("Marc Aurel Schnabel")))

# 计算节点的度中心性、介数中心性和特征向量中心性

degree\_centrality = nx.degree\_centrality(subgraph)

betweenness\_centrality = nx.betweenness\_centrality(subgraph)

eigenvector\_centrality = nx.eigenvector\_centrality(subgraph)

# 创建一个 DataFrame 存储中心性结果

centrality\_df = pd.DataFrame({

"Author": list(subgraph.nodes()),

"Degree Centrality": [degree\_centrality[author] for author in subgraph.nodes()],

"Betweenness Centrality": [betweenness\_centrality[author] for author in subgraph.nodes()],

"Eigenvector Centrality": [eigenvector\_centrality[author] for author in subgraph.nodes()]

})

# 保存中心性度量的结果到Excel文件

centrality\_df.to\_excel("Marc\_Aurel\_Schnabel\_centrality\_results.xlsx", index=False)

# 打印前几行以查看结果

print(centrality\_df.head())

|  |  |  |  |
| --- | --- | --- | --- |
| **Author** | **Degree Centrality** | **Betweenness Centrality** | **Eigenvector Centrality** |
| Thomas Kvan | 0.086206897 | 0.001209921 | 0.030480285 |
| Davide Pierini | 0.068965517 | 0 | 0.034945178 |
| Steve Kuan | 0.051724138 | 0 | 0.026979761 |
| Weidong Li | 0.051724138 | 0 | 0.026979761 |
| Mitra Homolja | 0.034482759 | 0 | 0.024707589 |
| Iman Sayah | 0.017241379 | 0 | 0.022993537 |
| Thomas Tucker | 0.24137931 | 0 | 0.244534337 |
| Tian Tian Lo | 0.310344828 | 0.016838072 | 0.259136601 |
| Marcos Novak | 0.24137931 | 0 | 0.244534337 |
| Yingyi Zhang | 0.017241379 | 0 | 0.022993537 |
| Evelyn L. C. Howe | 0.017241379 | 0 | 0.022993537 |
| Hartmut Seichter | 0.051724138 | 0 | 0.026979761 |
| Brandon Wang | 0.034482759 | 0 | 0.028810204 |
| Serdar Aydin | 0.103448276 | 0.001613228 | 0.053488103 |
| Blaire Haslop | 0.034482759 | 0 | 0.026704202 |
| David Batchelor | 0.017241379 | 0 | 0.022993537 |
| Amar Bennadji | 0.24137931 | 0 | 0.244534337 |
| Weihong Guo | 0.051724138 | 0 | 0.030957891 |
| Matthew Swarts | 0.24137931 | 0 | 0.244534337 |
| Shuva Chowdhury | 0.017241379 | 0 | 0.022993537 |
| Yi He | 0.051724138 | 0 | 0.026697784 |
| Yoann Pencreach | 0.24137931 | 0 | 0.244534337 |
| Liam Jordan Sheehan | 0.051724138 | 0 | 0.031748516 |
| Qiaoliang Xu | 0.068965517 | 0 | 0.034115259 |
| Scott Meekings | 0.051724138 | 0 | 0.030957891 |
| Sayyed Amir Hossain Maghool | 0.034482759 | 0 | 0.024707589 |
| Peter Christensen | 0.017241379 | 0 | 0.022993537 |
| Qun Dai | 0.017241379 | 0 | 0.022993537 |
| Tane Jacob Moleta | 0.344827586 | 0.045775358 | 0.083844067 |
| Maria Rogers | 0.068965517 | 0 | 0.034115259 |
| David Silcock | 0.051724138 | 0 | 0.031748516 |
| Rebeka Vital | 0.24137931 | 0 | 0.244534337 |
| Duong Nguyen | 0.034482759 | 0 | 0.028810204 |
| Sam Mclennan | 0.051724138 | 0 | 0.031748516 |
| James Holth | 0.051724138 | 0 | 0.030957891 |
| Irene Rui Chen | 0.017241379 | 0 | 0.022993537 |
| Bin Li | 0.051724138 | 0 | 0.030957891 |
| Rong Chen | 0.051724138 | 0 | 0.026697784 |
| Derek Kawiti | 0.034482759 | 0 | 0.024707589 |
| Andre Brown | 0.137931034 | 0.00282315 | 0.04235386 |
| Mercedes Paulini | 0.017241379 | 0 | 0.022993537 |
| Tomohiro Fukuda | 0.24137931 | 0 | 0.244534337 |
| Cyrus Qureshi | 0.034482759 | 0 | 0.028810204 |
| Hannah Rushton | 0.017241379 | 0 | 0.022993537 |
| Kostas ?Terzidis | 0.24137931 | 0 | 0.244534337 |
| Yoshihiro Kobayashi | 0.24137931 | 0 | 0.244534337 |
| Taro Narahara | 0.24137931 | 0 | 0.244534337 |
| Cameron Wells | 0.051724138 | 0 | 0.031748516 |
| Ruth ?Ron | 0.24137931 | 0 | 0.244534337 |
| Marc Aurel Schnabel | 1 | 0.848860657 | 0.331450137 |
| Jessie Rogers | 0.051724138 | 0 | 0.046786918 |
| Paolo Fiamma | 0.24137931 | 0 | 0.244534337 |
| Ning Wang | 0.051724138 | 0 | 0.026697784 |
| Xiangyu Wang | 0.051724138 | 0 | 0.026979761 |
| James Durcan | 0.034482759 | 0 | 0.024707589 |
| Dongsoo Choi | 0.24137931 | 0 | 0.244534337 |
| Tom獺s Dorta | 0.068965517 | 0 | 0.034945178 |
| Yingge Qu | 0.034482759 | 0 | 0.040970251 |
| Jeremy J. Ham | 0.017241379 | 0 | 0.022993537 |