SOCIAL NETWORK ANALYSIS OF RESEARCHERS (SONAR)

CmpE 491 Or CmpE 492

1. Objective

Analyzing the relation between researchers in a domain is possible via representing the authors of papers in that domain by a directed graph (DG). Thus, we can find/visualize the highly influential researchers in a domain.

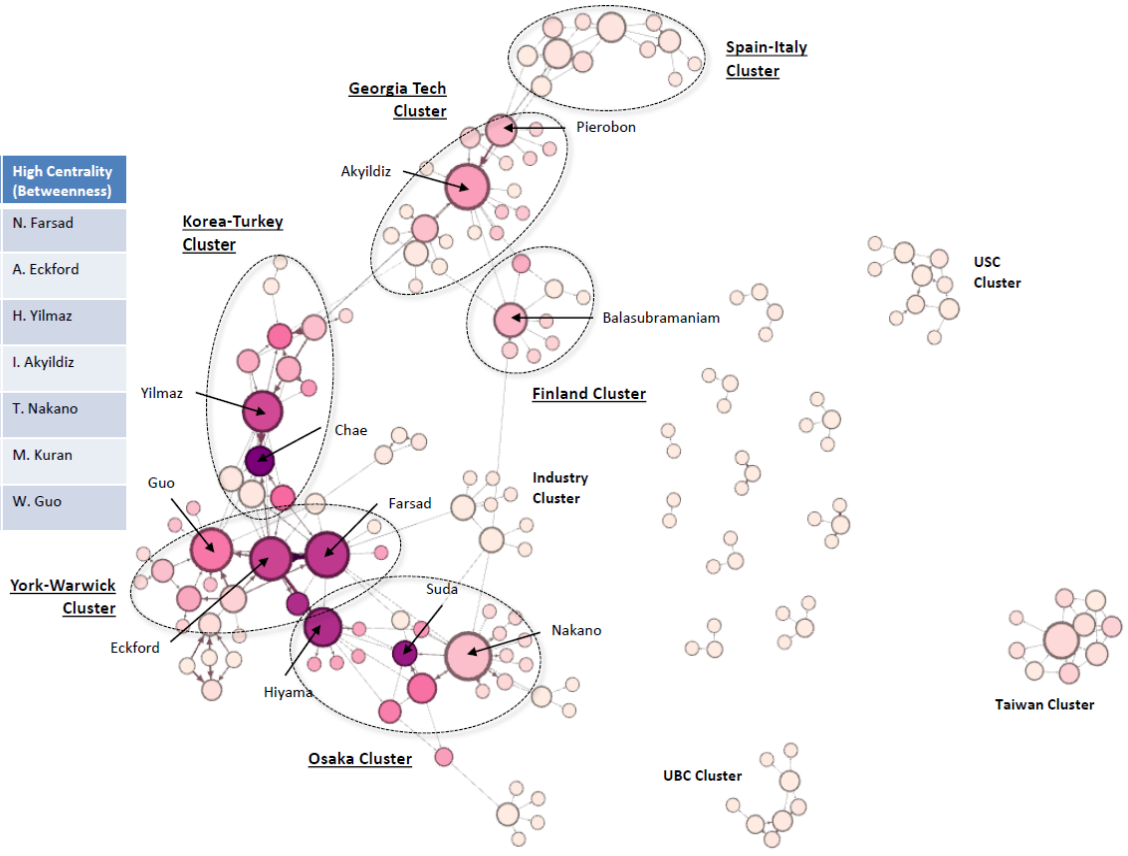
The main objectives of this project are:

- **O1.** to construct a network of researchers where the nodes represent the **authors** of the **selected** scientific **publications**,
- **O2.** to analyze the generated researcher network using social network analysis methods to examine the relations **between researchers**,
- **O3.** to develop a tool to search and browse the network in accordance with these relations (e.g. the influencers).
- **O4.** to provide a REST API that makes the results of this analysis available.

The following image illustrates a sample research network in a molecular communication domain, where darker colors indicate higher influence:

174 Authors
262 Connections
431 Papers
Connectivity (Node Size)
Influence (Colour)

High Connectivity (Degree)	High Influence (Eigenvector)	High Centrality (Betweenness)
T. Nakano	C.B. Chae	N. Farsad
A. Eckford	T. Suda	A. Eckford
N. Farsad	S. Hiyama	H. Yilmaz
W. Guo	Y. Moritani	I. Akyildiz
I. Akyildiz	A. Eckford	T. Nakano
H. Yilmaz	N. Farsad	M. Kuran
S. Hiyama	H. Yilmaz	W. Guo



2. Description

The following provides some guidelines for the main objectives:

O1: There are several resources that provide well documented APIs to fetch information about scientific publications: PubMed API, Elsevier Article Metadata API, Springer Nature API, PLOS API, ArXiv API, and IEEE Xplore API will be utilized for accessing metadata of scientific publications.
O2: There are numerous social network analysis (SNA) metrics that provide useful insights regarding a network, such as **in degree, out degree, betweenness,** and **eigenvector centralities.** There are several libraries that provide these functionalities.
O3: There will be a user-interface to facilitate the selection criteria and observe the results of the network analysis.

3. Required Skills

- Experience with REST API
- Python
- Web application

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