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#### . Introduction

UNIVERSITY of SAAG West Georgia.

Every year, thousands of research findings are presented at the AAG conference. It is difficult for scholars to quickly identify major topics, changes, and trends from thousands of geographic research presentations. The keywords network analysis has often been used to summarize research publications and trends. Using the keywords network analysis approach we aim at summarizing the 2019 AAG conference presentations.

# 

#### Most Frequent Keywords

I V	
Keywords	<b>Node Frequency</b>
GIS	386
Climate Change	209
Remote Sensing	198
China	162
Urban	154
Education	124
Agriculture	115
Political Ecology	107
Migration	99
Land Use	95

These are the top ten (10) keywords in the 2019 AAG conference. Geographic methodologies like 'GIS' and 'Remote Sensing' took the first and third places, respectively.

#### Most Influential Keywords

Keywords	<b>Eigenvector Centrality</b>
GIS	1.000
Climate Change	0.746
Urban	0.704
Agriculture	0.541
Migration	0.536
Remote Sensing	0.521
Political Ecology	0.495
Development	0.494
Gender	0.487
China	0.481

Eigenvector centrality is a measure of the influence of a node (keyword) on the network. It ranges 0.0-1.0. Larger values indicate more influential. The top 10 influential keywords are slightly different from the most frequently used keywords. Their orders are slightly different too.

#### Most Frequently Co-occurring Keywords

Co-occurring keywords	Frequency
GIS - Remote Sensing	32
GIS – Spatial	24
Climate Change – Adaptation	23
Land Use - Land Cover	20
Remote Sensing - Land Cover	18
Climate Change – Resilience	16
GIS – Health	15
Remote Sensing - Machine Learning	15
Remote Sensing - Agriculture	15
Remote Sensing - Landsat	14
Geospatial techniques tend to appe	ear together.

nequently appears 'Adaptation' and 'Resilience', and 'Health' and 'Agriculture' tend to tie strongly with 'GIS'.

Settler Colonialism

Node size indicates the frequency of keywords. Edge width represents the co-occurring frequency. Circle colors indicate the clustered groups of keywords that were often used together in abstracts.



# Summarizing the 2019 AAG Conference Presentations Using Keywords Network Analysis

Presented at the SEDAAG 2019 Conference, Wilmington, NC, 11/25/2019

### $\square$ . Methodology

We collected 12,055 keywords from 6,027 abstracts presented at the 2019 AAG conference. To create a visual summary, R with the Bibliometrix and iGraph packages and Cytoscape were used to build a network of keywords. The network was analyzed by computing the distribution of node degrees, neighborhood connectivity, and centrality metrics. A word cloud was created to visualize the frequency of keywords as a whole. The Keywords network was clustered using the Louvain algorithm in R.



Each word size indicates its frequency.

#### Keyword Groups

Group ID	Keywords			
Δ	GIS, Remote Sensing, Land Use, Education,			
A	Machine Learning, Spatial, Big Data, etc.			
Л	Climate Change, Resilience, Climate, Adaptation			
В	Hurricanes, Drought, etc.			
C	Urban, Gentrification, Mobility, Infrastructure,			
C	Environmental Justice, Planning, etc.			
D	Agriculture, Political Ecology, Sustainability,			
D	Conservation, Governance, Water, Gender, etc.			
	Migration, Political, Race, Refugees, Landscap			
E	Historical, Borders, Cultural, etc.			
F	China, Urbanization, Land Use Change			
C	Tourism, Networks, Social Media, Technology,			
G	Social Networks			
Н	Food Security, Agroecology			
Ι	Smart City			
J	Ecosystem Services			
K	Geomorphology			
Each gro	up indicates the community where			
keywords	are highly connected and appear			
together	in abstracts. The top five groups			
represent emerging geospatial technologies.				
environmental impacts urbanization sustainability				
and dependities				

#### Keywords with High Frequency But with **Relatively Low Influence**

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technology keywords Geospatial frequently but their influences in the keywords network are relatively low.

#### Keywords with High Influence But **Relatively Low Frequency**

Keywords	Frequency	Observed Eigenvector Centrality	Est Eige Cer	
Migration	99	0.536	0	
Development	78	0.494	0	
Gender	78	0.487	0	
Cities	56	0.396	0	
Policy	35	0.305	0	
The known of that focus on our of				

The keywords that focus on our changing community appear less than expected when considering their influences in the keywords network.

# KHU IIIP



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#### IV. Summary

- The 2019 AAG conference presentations were summarized using the keywords network analysis. 'GIS' and 'Climate Change' were the most frequently used in research papers. Papers were grouped into five areas, i.e. emerging geospatial technologies, environmental impacts, urbanization, sustainability and geopolitics, which is quite different from the traditional division such as human geography, physical geography and geographic methodologies. The new groups appear to well represent the unique characteristic of geography which is the holistic view of the world.
- This research demonstrates that keyword network analysis is an effective tool for summarizing conference abstracts. Our preliminary results represent a stepping stone toward revealing a more comprehensive landscape of the research presented at AAG over the years, which may contribute to helping researchers identify overarching themes and trends in geography.

#### **Future Research**

- Retrieving keywords from
- abstracts using machine learning Summarizing annual trend using
- different year data
- How GIS is used and researched
- Comparing different clustering algorithms
- Analysis of each group in more detail

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