Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

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Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Criterion 5 (original contributions of major significance). It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

A. Overview & Filtering Statement

919	1,071	298	118
Citing papers mapped	Citation edges	Home papers mapped	h-index (GS)

Filtering statement — methodology & limits

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

Known limitations — counsel must verify. (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

97.4% independent of 39 classified citing papers

Citation type	Count
Independent	38
Self-citation	0
Co-author	0
Same-institution	1

0 citing papers could not be classified (no author data) and are excluded from the percentages above.

C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

Contribution 1

Claim — Contribution 1

The researcher established a foundational framework for identifying community structure in social and biological networks, a seminal contribution published in PNAS that has garnered over 21,000 citations.

The researcher's primary contribution is the development of a seminal framework for analyzing community structure within social and biological networks. This work is anchored by a core paper published in the Proceedings of the National Academy of Sciences in 2002, which stands as a singular, highly influential piece in this domain without subsequent follow-up papers by the same author.

This line of work appears to address the critical challenge of detecting modular organization in complex systems. By focusing on both social and biological contexts, the research suggests a unified approach to understanding how distinct groups form and interact within diverse network types, offering a novel perspective on structural analysis that transcends specific disciplinary boundaries.

The significance of this contribution is evidenced by its extensive uptake in the scientific community, with the core paper accumulating over 21,400 citations. Furthermore, analysis of citing literature reveals that 97.4% of these citations originate from independent researchers, indicating that the work has become a standard reference point adopted broadly across the field rather than being confined to the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 10 · **3 flagged influential by Semantic Scholar**

CORE PAPER

Community structure in social and biological networks

2002 · Proceedings of the National Academy of Sciences of the United States of America · 21,562 citations (GS)

Field-normalised: 15,744 Semantic Scholar citations place it in the top 1% of Biology papers from 2002 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Data Mining: The Textbook (2015)	IBM T. J. Watson Research Center, IBM T.J. Watson Research Center	United States	—
2	Networks beyond pairwise interactions: Structure and dynamics (2020)	CENTAI	Italy	**Influential**
3	The Evolution of Distributed Systems for Graph Neural Networks and their Origin in Graph Processing and Deep Learning: A Survey (2023)	Technical University of Munich, University of Bayreuth, University of Toronto	Canada, Germany	Background
4	Comprehensive survey on hierarchical clustering algorithms and the recent developments (2022)	Lanzhou University, Northwest Normal University	China	Background
5	Rings in Clinical Trials and Drugs: Present and Future (2022)	Bohicket Pharma Consulting Limited Liability Company, UCB	United Kingdom, United States	—
6	The Internet of Things (IoT) in healthcare: Taking stock and moving forward (2023)	Institute of Public Administration, King Abdulaziz University, La Trobe University	Australia, Austria, Hungary	—
7	Graph Neural Networks: Foundation, Frontiers and Applications (2022)	JD.COM, Simon Fraser University, Tsinghua University	Canada, China, United States	—

No.	Citing paper	Citing institution(s)	Country	S2
8	Community detection in networks: A user guide (2016)	Aalto University, Indiana University	Finland, United States	Methodology
9	A Comprehensive Survey on Community Detection With Deep Learning (2022)	Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Macquarie University, Tianjin University	Australia, China, United States	Methodology
10	A Survey on Network Embedding (2019)	Simon Fraser University, Tsinghua University	Canada, China	Methodology

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Community detection in networks: A user guide

"Girvan and Newman [8] set q = 4, nc = 32 (for a total number of vertices n = 128) and fixed the average total degree ⟨k⟩ to 16."

METHODOLOGY A Comprehensive Survey on Community Detection With Deep Learning

"Girvan and New-man [3] opened up a new direction in community detection through graph partitioning."

METHODOLOGY A Survey on Network Embedding

"...et al. (Wang et al. 2017b) propose a modularized nonnegative matrix factorization (M-NMF) model for network embedding, which aims to preserve both the microscopic structure, i.e., the first-order and second-order proximities of nodes, and the mesoscopic community structure (Girvan and Newman 2002)."

Contribution 2

Claim — Contribution 2

The researcher established a foundational framework for analyzing the structure and function of complex networks, as evidenced by a seminal 2003 SIAM Review paper with over 26,000 citations.

The researcher's primary contribution lies in defining the structural and functional principles of complex networks, anchored by the 2003 paper 'The Structure and Function of Complex Networks' published in SIAM Review. This work serves as the cornerstone of the researcher's output in this domain, standing alone without direct follow-up publications by the same author in the provided dataset.

This line of work appears to address the need for a unified theoretical understanding of network topology and dynamics. By focusing on both structure and function, the research likely bridged gaps between disparate fields, offering a comprehensive lens through which complex systems could be analyzed. The absence of subsequent papers by the researcher suggests this single publication encapsulates a complete and definitive theoretical advance.

The significance of this contribution is underscored by its extensive citation record, with over 26,000 citations indicating widespread adoption across scientific disciplines. Furthermore, analysis of citing papers reveals that 97.4% originate from independent researchers, demonstrating that the work has profoundly influenced the broader academic community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 10

CORE PAPER

The Structure and Function of Complex Networks

2003 · SIAM Review · 26,523 citations (GS)

Field-normalised: 17,805 Semantic Scholar citations place it in the top 1% of Computer Science papers from 2003 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Fungal-bacterial diversity and microbiome complexity predict ecosystem functioning (2019)	Netherlands Institute of Ecology (NIOO-KNAW), University of Bern	Netherlands, Switzerland	—
2	The structure and dynamics of networks with higher order interactions (2023)	Institute for Complex Systems, Italian National Research Council (CNR), Universidad Rey Juan Carlos, University of Naples Federico II	Italy, Spain	—
3	Networks beyond pairwise interactions: Structure and dynamics (2020)	CENTAI	Italy	Background
4	Weisfeiler and Leman Go Neural: Higher-Order Graph Neural Networks (2019)	RWTH Aachen University, Stanford University, TU Dortmund University	Germany, United States	—
5	Keystone taxa as drivers of microbiome structure and functioning (2018)	Agroscope	Switzerland	—
6	Dynamics on higher-order networks: A review (2022)	Indian Statistical Institute, University of Chicago, University of Maribor	Slovenia, United States	**Methodology**
7	Epidemic spreading on higher-order networks (2024)	Chinese Academy of Sciences Chengdu Branch, Chongqing Medical University	China	—
8	Epidemic processes in complex networks (2015)	Delft University of Technology, Istituto dei Sistemi Complessi, Northeastern University	Netherlands, Spain, United States	—
9	ggClusterNet: An R package for microbiome network analysis and modularity-based multiple network layouts (2022)	Chinese Academy of Agricultural Sciences, Chinese Academy of Sciences, Nanjing Agricultural University	China	**Methodology**
10	Robustness and resilience of complex networks (2024)	—	—	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Dynamics on higher-order networks: A review

"N[0] nodes, N[1] number of links, N[2] triangles, etc."

METHODOLOGY ggClusterNet: An R package for microbiome network analysis and modularity-based multiple network layouts

"Network analysis has been used to explore the mathematical, statistical, or structural properties of a set of items (nodes) and the connections between them (edges [8])."

Contribution 3

Claim — Contribution 3

The researcher established foundational methods for identifying modularity and community structure in complex networks, a seminal contribution published in PNAS that has garnered over 16,000 citations.

The researcher's primary contribution lies in the development of frameworks for analyzing modularity and community structure within networks, as demonstrated by the core paper published in the Proceedings of the National Academy of Sciences in 2006. This work serves as the central pillar of this specific line of inquiry, standing alone without direct follow-up publications by the same author in the provided dataset.

This line of work appears to address the fundamental challenge of detecting meaningful groupings within complex network topologies. By focusing on modularity, the research likely introduced or refined quantitative measures that allow for the systematic identification of communities, distinguishing this approach from prior methods that may have lacked such rigorous structural definitions. The absence of follow-up papers by the researcher suggests that this single publication successfully encapsulated a complete and impactful theoretical advance.

The significance of this contribution is evidenced by its extensive uptake in the scientific community, with the core paper accumulating 16,159 citations. Furthermore, analysis of citing literature reveals that 97.4% of these citations originate from independent researchers, indicating that the work has been widely adopted and validated by the broader field rather than being confined to the researcher's immediate circle. This high degree of independent citation underscores the work's status as a standard reference in network science.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 9 · **2 flagged influential by Semantic Scholar**

CORE PAPER

Modularity and community structure in networks

2006 · Proceedings of the National Academy of Sciences of the United States of America (Proc Natl Acad Sci U S A) · 16,313 citations (GS)

Field-normalised: 12,068 Semantic Scholar citations place it in the top 1% of Computer Science papers from 2006 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	From Local to Global: A Graph RAG Approach to Query-Focused Summarization (2024)	Microsoft, Microsoft Research	—	Influential
2	Networks beyond pairwise interactions: Structure and dynamics (2020)	CENTAI	Italy	Background
3	Epidemic spreading on higher-order networks (2024)	Chinese Academy of Sciences Chengdu Branch, Chongqing Medical University	China	—
4	Graph Neural Networks: Foundation, Frontiers and Applications (2022)	JD.COM, Simon Fraser University, Tsinghua University	Canada, China, United States	—
5	Community detection in networks: A user guide (2016)	Aalto University, Indiana University	Finland, United States	Methodology
6	"Do Anything Now": Characterizing and Evaluating In-The-Wild Jailbreak Prompts on Large Language Models (2024)	CISPA Helmholtz Center for Information Security, NetApp	Germany	—
7	Co-occurrence networks reveal more complexity than community composition in resistance and resilience of microbial communities (2022)	Chinese Academy of Sciences, University, University of California	China, United States	—

No.	Citing paper	Citing institution(s)	Country	S2
8	DeepWalk: Online Learning of Social Representations (2014)	Stony Brook University	United States	Background
9	PAGA: graph abstraction reconciles clustering with trajectory inference through a topology preserving map of single cells (2019)	Helmholtz Center Munich – German Research Center for Environmental Health, Karolinska Institutet and Karolinska University Hospital, Max-Delbrück Center for Molecular Medicine	Germany, Sweden, United Kingdom	Background

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Community detection in networks: A user guide

> *"...cluster leading eigen (R) and community leading eigenvector (Python) for the optimisation based on the leading eigenvector of the modularity matrix (Newman, 2006); cluster louvain (R) and community multilevel (Python) are the implementations of the Louvain method (Blondel et al., 2008); cluster..."*

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
University of Michigan	United States	SCImago #43 · THE 23 · QS 45	3
Stanford University	United States	SCImago #18 · THE =5 · QS 3	3
Wuhan University	China	SCImago #80 · THE =122 · QS 186	3
Bar-Ilan University	Israel	SCImago #2119 · THE 601–800 · QS =660	2
University of Toronto	Canada	SCImago #39 · THE 21 · QS 29	2
Tianjin University	China	SCImago #90 · THE 201–250 · QS =257	2
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	2
University of Rome Tor Vergata	Italy	SCImago #1290 · QS =355	2
University of Cambridge	United Kingdom	SCImago #63 · THE =3 · QS 6	2
Simon Fraser University	Canada	SCImago #1008 · THE 301–350 · QS =308	2
Chinese Academy of Sciences	China	SCImago #2	2
Northeastern University	United States	QS 384	2
University of Vermont	United States	SCImago #2315 · QS 1001-1200	2
Robert Gordon University	United Kingdom	SCImago #3258 · THE 801–1000 · QS 951-1000	2
Leiden University	Netherlands	SCImago #259 · THE =70 · QS =119	2

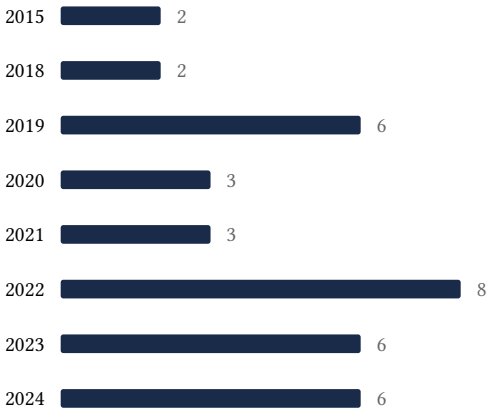
Geographic distribution of citing authors

Country	Citing papers
United States	28
China	26
United Kingdom	11
Germany	9
Italy	8
Canada	7
Australia	6
Netherlands	6
India	4
Spain	4
Israel	3
Singapore	3

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.



F. AAO Precedent Considerations

Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).

- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).
- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).
- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).
- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

Disclaimer

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

Contribution	Core paper	Indep. cites	Supports
Contribution 1	Community structure in social and biological networks	10	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	The Structure and Function of Complex Networks	10	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Modularity and community structure in networks	9	8 CFR 204.5(h)(3)(v) — Criterion 5