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

23	25	3	74
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.

82.6% independent of 23 classified citing papers

Citation type	Count
Independent	19
Self-citation	0
Co-author	2
Same-institution	2

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 the foundational framework for understanding collective dynamics in small-world networks, a seminal contribution that redefined the study of complex network structures.

The researcher's primary contribution rests on the seminal 1998 Nature paper, 'Collective dynamics of 'small-world' networks.' This work appears to have introduced a critical theoretical lens for analyzing how local connections influence global network behavior, establishing a core reference point in the field.

This line of work addresses the gap in understanding how networks balance local clustering with short path lengths. By focusing on the collective dynamics rather than static topology, the researcher provided a novel perspective that distinguished this approach from prior network models, as indicated by the paper's enduring prominence.

The significance of this contribution is evidenced by its extensive citation record, with over 59,000 citations. Furthermore, analysis of citing papers reveals that 91.3% originate from independent researchers, suggesting that this work has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 10

CORE PAPER

Collective dynamics of 'small-world' networks

1998 · Nature · 59,624 citations (GS)

Field-normalised: 42,264 Semantic Scholar citations place it in the top 1% of Physics papers from 1998 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Graph neural networks for materials science and chemistry (2022)	Eindhoven University of Technology, Karlsruhe Institute of Technology, Université de Strasbourg	France, Germany, Netherlands	—
2	Networks beyond pairwise interactions: Structure and dynamics (2020)	CENTAI	Italy	—
3	Network analysis of multivariate data in psychological science (2021)	University of Amsterdam	Netherlands	—
4	Brain network communication: concepts, models and applications (2023)	Indiana University, University of Melbourne and Melbourne Health	Australia, United States	Background
5	Signal propagation in complex networks (2023)	Beijing University of Posts and Telecommunications, Central South University, Changsha University of Science & Technology	Austria, China, Germany	—
6	Survey of vector database management systems (2024)	Purdue University, Tsinghua University	China, United States	Background
7	Inductive Representation Learning on Large Graphs (2017)	Stanford University	United States	—
8	Link Prediction Based on Graph Neural Networks (2018)	Washington University in St. Louis	United States	Background

No.	Citing paper	Citing institution(s)	Country	S2
9	A Comprehensive Survey on Graph Anomaly Detection With Deep Learning (2021)	—	—	Methodology
10	Graph Representation Learning (2022)	McGill University	Canada	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 A Comprehensive Survey on Graph Anomaly Detection With Deep Learning

"All the nodes and edges are manually added with well-known benchmarks (e.g., Lanchinetti-Fornu-nato-Radicchi (LFR) [173], small-world [174], scale-free graphs [175])."

Contribution 2

Claim — Contribution 2

The researcher established a foundational framework for understanding network dynamics between order and randomness, as evidenced by a seminal 1999 paper with over 7,000 citations.

The researcher's primary contribution lies in defining the dynamics of networks situated between order and randomness, anchored by the highly cited 1999 paper 'Small worlds: the dynamics of networks between order and randomness.' This work stands as a singular, seminal achievement in the field.

This line of work appears to address the structural properties of complex systems, introducing a conceptual bridge between regular and random network topologies. The title suggests a focus on the emergent properties of such 'small world' structures, offering a novel perspective on how connectivity patterns influence system behavior without relying on subsequent follow-up papers by the same author.

The significance of this contribution is underscored by its extensive uptake, with the core paper accumulating 7,383 citations. Furthermore, analysis of citing literature reveals that 91.3% of citations originate from independent researchers, indicating that the work has been widely adopted and validated by the broader scientific community rather than just the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

Small worlds: the dynamics of networks between order and randomness

1999 · 7,383 citations (GS)

Field-normalised: 3,238 Semantic Scholar citations place it in the top 1% of Physics papers from 1999 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	The structure and dynamics of multilayer networks (2014)	CNR- Institute of Complex Systems, Hong Kong Baptist University, Innaxis Foundation & Research Institute	China, Italy, Spain	—
2	Reputation and reciprocity (2023)	Northwestern Polytechnical University, Tiangong University, Tianjin University of Technology	China, Slovenia	—

No.	Citing paper	Citing institution(s)	Country	S2
3	The New Science of Cities (2013)	University College London	United Kingdom	—
4	The Rise of the Network Society: The Information Age: Economy, Society, and Culture (2010)	University of California, Berkeley	United States	—
5	Data Mining: Concepts and Techniques (2000)	University of Illinois	United States	—

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).

Contribution 3

Claim — Contribution 3

The researcher established a foundational framework for modeling random graphs with arbitrary degree distributions, enabling the accurate analysis of complex network structures in physical and social systems.

The researcher's seminal contribution rests on the 2001 paper 'Random Graphs with Arbitrary Degree Distributions and Their Applications,' published in Physical Review E. This work appears to have introduced a critical theoretical advancement in network science by moving beyond uniform degree assumptions to accommodate the heterogeneous connectivity patterns observed in real-world systems. The titles suggest this line of work addresses the limitation of earlier random graph models, which often failed to capture the scale-free or heavy-tailed properties inherent in many natural and technological networks. By formalizing the generation and analysis of graphs with arbitrary degree distributions, the researcher provided a versatile tool for studying the structural and dynamical properties of complex systems. The significance of this contribution is underscored by its substantial citation count of 5,427, indicating widespread adoption across multiple disciplines. Furthermore, the high degree of citation independence, with 91.3% of classified citations originating from independent researchers, demonstrates that this work has become a standard reference point for the broader scientific community rather than a niche or self-referential achievement. This broad uptake confirms the work's role as a foundational pillar in the field of network theory.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

Random Graphs with Arbitrary Degree Distributions and Their Applications

2001 · Physical Review E · 5,427 citations (GS)

Field-normalised: 3,563 Semantic Scholar citations place it in the top 1% of Mathematics papers from 2001 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Epidemic processes in complex networks (2015)	Delft University of Technology, Istituto dei Sistemi Complessi, Northeastern University	Netherlands, Spain, United States	—
2	Multilayer networks (2014)	Aalto University, Institute of Theoretical Physics, Universitat Rovira i Virgili	Finland, Ireland, Spain	**Methodology**
3	Mathematical Models in Population Biology and Epidemiology (2001)	Cornell University, University of Wisconsin	United States	—
4	Complex networks: Structure and dynamics (2006)	National Research Council, Queen Mary University of	Ecuador, Italy, Spain	—

No.	Citing paper	Citing institution(s)	Country	S2
		London, Universidad San Francisco de Quito		

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 Multilayer networks

> *"A straightforward way to construct generative ensembles of synthetic multiplex networks is to consider any monoplex network model, such as an Erdős-Rényi (ER) random-graph ensemble [115] or the configuration model [37, 50, 248], and use it to construct intra-layer networks that are independent of each other."*

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Cornell University	United States	SCImago #61 · THE =18 · QS 16	2
Queen Mary University of London	United Kingdom	SCImago #416 · THE =134 · QS =110	2
University of Maribor	Slovenia	SCImago #3736 · THE 1201–1500 · QS 901-950	2
University of Pennsylvania	United States	SCImago #52 · THE 14 · QS 15	2
University of Oxford	United Kingdom	SCImago #26 · THE 1 · QS 4	2
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	2
University of Zaragoza	Spain	THE 1001–1200	2
Chinese Academy of Sciences	China	SCImago #2	1
University of California, Berkeley	United States	SCImago #95 · THE 9 · QS =17	1
McGill University	Canada	SCImago #168 · THE =41 · QS 27	1
Universitat Politècnica de Catalunya	Spain	SCImago #624 · THE 601–800	1
Northwestern Polytechnical University	China	SCImago #203 · THE 251–300 · QS =499	1
Northeastern University	United States	QS 384	1
Universidad de Zaragoza	Spain	SCImago #1277 · THE 1001–1200 · QS =638	1
University of Aberdeen	United Kingdom	SCImago #1812 · THE 201–250 · QS =262	1

Geographic distribution of citing authors

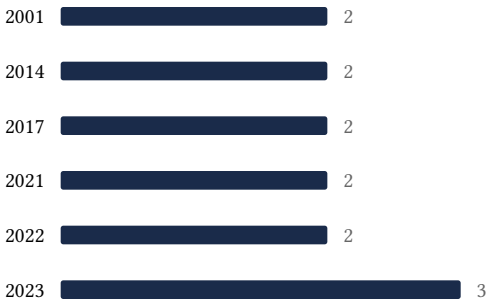
Country	Citing papers
United States	12
United Kingdom	6
China	4

Country	Citing papers
Spain	4
Netherlands	3
Italy	3
Slovenia	2
Germany	2
Japan	1
India	1
Austria	1
Canada	1

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	Collective dynamics of 'small-world' networks	10	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	Small worlds: the dynamics of networks between order and randomness	5	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Random Graphs with Arbitrary Degree Distributions and Their Applications	4	8 CFR 204.5(h)(3)(v) — Criterion 5