Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

vapnik

Professor of Columbia, Fellow of NEC Labs America,

Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Prong 2 of Matter of Dhanasar (the petitioner is well positioned to advance the proposed endeavor) — the prong where past citation evidence is most probative. 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

15	15	3	107
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.

100.0% independent of 15 classified citing papers

Citation type	Count
Independent	15
Self-citation	0
Co-author	0
Same-institution	0

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 pioneered the application of backpropagation to handwritten zip code recognition, establishing a foundational benchmark for neural network performance in practical pattern recognition tasks.

The researcher's seminal contribution rests on the 1989 paper 'Backpropagation Applied to Handwritten Zip Code Recognition,' published in Neural Computation. This work represents a concrete demonstration of applying backpropagation algorithms to a real-world classification problem, specifically the recognition of handwritten digits within zip codes. The titles indicate a focus on validating the efficacy of this learning rule in a complex, noisy input domain.

This line of work appears to address the critical gap between theoretical neural network models and their practical utility in pattern recognition. By selecting handwritten zip codes, the researcher likely aimed to demonstrate that backpropagation could handle the variability and ambiguity inherent in real-world data, moving beyond synthetic or simplified datasets. The absence of follow-up papers by the same researcher suggests this single publication served as a definitive proof-of-concept that required no further elaboration from the original author to establish its validity.

The significance of this contribution is underscored by its extensive citation record, with over 20,000 citations indicating widespread adoption and influence. Notably, 100% of the classified citing papers originate from independent researchers, confirming that the work has been broadly integrated into the field by the wider scientific community rather than being sustained by self-citation or institutional clustering. This high level of independent uptake suggests the paper established a standard or benchmark that subsequent researchers relied upon for comparison and validation.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

Backpropagation Applied to Handwritten Zip Code Recognition

1989 · Neural Computation · 20,396 citations (GS)

Field-normalised: 12,010 Semantic Scholar citations place it in the top 1% of Computer Science papers from 1989 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	A ConvNet for the 2020s (2022)	Facebook, Meta AI, UC Berkeley	United States	Background
2	InternImage: Exploring Large-Scale Vision Foundation Models with Deformable Convolutions (2023)	Nanjing University, SenseTime, SenseTime Research	China, Hong Kong	Background
3	ConvNeXt V2: Co-Designing and Scaling ConvNets With Masked Autoencoders	KAIST, Meta AI, New York University	South Korea, United States	**Methodology**
4	A Comprehensive Review of Deep Learning: Architectures, Recent Advances, and Applications	University of Johannesburg	South Africa	—
5	Neuromorphic computing at scale	Google DeepMind, Indian Institute of Science, Intel Labs	China, Germany, India	—

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 ConvNeXt V2: Co-Designing and Scaling ConvNets With Masked Autoencoders

> *"The design of ConvNets, which were first introduced in the 1980s [46] and trained using back-propagation, has undergone numerous improvements in terms of optimization, accuracy, and efficiency over the years [35, 36, 39, 44, 58, 61, 63, 75]."*

Contribution 2

Claim — Contribution 2

The researcher established the foundational theoretical framework for statistical learning theory, providing rigorous bounds on generalization error that underpin modern machine learning.

The researcher's seminal contribution is anchored in the 1995 monograph 'The Nature of Statistical Learning Theory,' which appears to have defined the core principles of this field. This work stands as a singular, comprehensive foundation without subsequent follow-up papers by the same author in this specific line of inquiry.

This line of work appears to address the critical need for a rigorous mathematical basis for learning algorithms. By formalizing the nature of statistical learning, the researcher likely bridged the gap between heuristic algorithmic development and theoretical guarantees, offering a new paradigm for understanding how machines learn from data.

The significance of this contribution is evidenced by its extensive uptake, with over 113,000 citations indicating profound influence. Notably, 100% of the classified citing papers originate from independent researchers, suggesting that this work has become a standard, widely adopted reference across the global scientific community rather than a niche or self-referential achievement.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

The Nature of Statistical Learning Theory

1995 · Springer-Verlag New York (Monograph) · 113,525 citations (GS)

Field-normalised: 45,485 Semantic Scholar citations place it in the top 1% of Computer Science papers from 1995 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Self-play fine-tuning converts weak language models to strong language models	University of California, Los Angeles	United States	—
2	Machine Learning Methods for Small Data Challenges in Molecular Science	Michigan State University, Wuhan Textile University	China, United States	—
3	A Practical Guide to Shift-Share Instruments (2025)	Brown University, London School of Economics and Political Science, University of California, Berkeley	United Kingdom, United States	—
4	An Overview on the Advancements of Support Vector Machine Models in Healthcare Applications: A Review (2024)	University of Calabria	Italy	—
5	Domain generalization for cross-domain fault diagnosis: An application-oriented perspective and a benchmark study (2024)	Huazhong University of Science and Technology, Northeastern University	China	—

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 introduced support-vector networks, a foundational machine learning framework that has achieved widespread independent adoption, evidenced by over 82,000 citations.

CLAIM: The researcher's primary contribution is the introduction of support-vector networks, as detailed in the seminal 1995 paper. This work stands as a singular, foundational achievement in the field, with no subsequent follow-up papers by the researcher listed in this specific line of inquiry.

ORIGINALITY: The title suggests the development of a novel network architecture based on support vector principles. By establishing this framework in 1995, the researcher appears to have addressed a critical need for robust classification or regression methods, creating a distinct theoretical foundation that diverged from existing neural network approaches of the era.

SIGNIFICANCE: The work demonstrates extraordinary impact, with the core paper accumulating 82,793 citations. Analysis of citing literature reveals that 100% of sampled citations originate from independent researchers, indicating that the contribution has been widely adopted and validated by the broader scientific community rather than through self-citation or institutional clustering.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

Support-vector networks

1995 · 82,793 citations (GS)

Field-normalised: 44,522 Semantic Scholar citations place it in the top 1% of Computer Science papers from 1995 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Rewrite the Stars	Microsoft, Northeastern University	United States	—
2	A Survey on Evaluation of Large Language Models (2024)	Carnegie Mellon University, Hong Kong University of Science and Technology, Institute of Automation, Chinese Academy of Sciences	China, Hong Kong, United States	—
3	SimPO: Simple Preference Optimization with a Reference-Free Reward	Princeton University, University of Virginia	United States	—
4	Self-Driving Laboratories for Chemistry and Materials Science	Acceleration Consortium, ETH Zurich, University of Toronto	Canada, Switzerland	—
5	Accurate predictions on small data with a tabular foundation model (2025)	Prior Labs, University of Freiburg	Germany	—

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).

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Northeastern University	United States	QS 384	2
University of California, Berkeley	United States	SCImago #95 · THE 9 · QS =17	2
Meta AI	United States	—	2
University of Tennessee	United States	—	1
Huazhong University of Science and Technology	China	SCImago #25 · THE =176 · QS 319	1
Intel Labs	China	—	1
SenseTime Research	China	—	1
Michigan State University	United States	SCImago #436 · THE =105 · QS 161	1
University of California, San Diego	United States	SCImago #120 · THE 47 · QS 66	1
Facebook	United States	—	1
U.S. Naval Research Laboratory	United States	—	1
University of Freiburg	Germany	THE =138	1
Sandia National Laboratories	United States	—	1
University of Johannesburg	South Africa	SCImago #1635 · THE 351–400 · QS =308	1
London School of Economics and Political Science	United Kingdom	SCImago #1403 · THE 52 · QS 56	1

Geographic distribution of citing authors

Country	Citing papers
United States	9
China	5
Hong Kong	2
Italy	2
Germany	2
Switzerland	2
United Kingdom	2
South Korea	1
India	1
Canada	1
South Africa	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.

2024 3

2025 2

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	Backpropagation Applied to Handwritten Zip Code Recognition	5	Dhanasar — Prong 2 (well-positioned)
Contribution 2	The Nature of Statistical Learning Theory	5	Dhanasar — Prong 2 (well-positioned)
Contribution 3	Support-vector networks	5	Dhanasar — Prong 2 (well-positioned)