Citation Evidence Report

EB-1B Petition — Outstanding Professor or Researcher

8 CFR § 204.5(i)(3) · Authorship + Original Contributions

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NVIDIA

Google Scholar profile

Generated 2026-05-30 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to the 8 CFR § 204.5(i)(3) outstanding-researcher criteria — particularly (iii) published material and (v) original scientific or scholarly contributions. 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

638	671	17	10
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.

88.9% independent of 624 classified citing papers

Citation type	Count
Independent	555
Self-citation	6
Co-author	63
Same-institution	0

14 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 real-time human motion reconstruction from sparse IMUs with simultaneous terrain generation, establishing a foundational framework for egocentric motion analysis.

The researcher's core contribution rests on the 2022 paper 'Transformer inertial poser,' which introduced a method for real-time human motion reconstruction from sparse IMUs while simultaneously generating terrain. This work appears to address the challenge of accurately capturing complex human movement and environmental context using limited sensor data, a significant gap in prior motion capture technologies. The titles suggest a novel integration of transformer architectures with inertial measurement units to enable robust, real-time performance without dense optical setups.

This line of work demonstrates originality by extending the initial framework into broader, more complex domains. Follow-up papers, such as 'Nymeria' (2024) and 'HMD2' (2025), indicate a progression toward massive multimodal datasets and environment-aware motion generation from single head-mounted devices. The chronology suggests the researcher built upon the core inertial poser foundation to tackle increasingly difficult problems involving egocentric perspectives and large-scale data collection in the wild.

The significance of this contribution is evidenced by substantial independent uptake. The core paper has accumulated 158 citations, with follow-up works also garnering significant attention. Notably, 88.9% of the 624 classified citations for this scholar originate from independent researchers, indicating that the broader scientific community, rather than just the researcher's immediate circle, has adopted and built upon these methods. This high degree of independent citation underscores the foundational nature of the work in the field of motion reconstruction.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 238 · **28 flagged influential by Semantic Scholar**

CORE PAPER

Transformer inertial poser: Real-time human motion reconstruction from sparse imus with simultaneous terrain generation

2022 · 158 citations (GS)

Field-normalised: 116 Semantic Scholar citations place it in the top 1% of Engineering papers from 2022 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Avatars grow legs: Generating smooth human motion from sparse tracking inputs with diffusion model	CSIC-UPC, Meta AI	Spain, United States	—
2	FlashCap: Millisecond-Accurate Human Motion Capture via Flashing LEDs and Event-Based Vision	Xiamen University	China	—
3	Egocentric human pose estimation using head-mounted mmwave radar	Michigan State University, Singapore University of Technology and Design, Southeast University	China, Singapore, United States	—
4	Lead-free perovskite-inspired semiconductors for indoor light-harvesting–the present and the future	Tampere University, University of St Andrews	Finland, United Kingdom	—
5	Challenges and advances in the use of wearable sensors for lower extremity biomechanics	Shanghai Jiao Tong University, Stanford University, University of Delaware	China, United States	—

No.	Citing paper	Citing institution(s)	Country	S2
6	Imuposer: Full-body pose estimation using imus in phones, watches, and earbuds	Carnegie Mellon University	United States	—
7	Emdb: The electromagnetic database of global 3d human pose and shape in the wild	ETH Zurich, ETH Zürich, HKUST (GZ)	China, Switzerland	—
8	Human action recognition in immersive virtual reality based on multi-scale spatio-temporal attention network	Arizona State University, School of Electrical and Electronic Engineering Nanyang Technological University Singapore Singapore, Wuhan Textile University	China, United States	—
9	Learning-based 3D human kinematics estimation using behavioral constraints from activity classification	Harvard University	United States	**Influential**
10	Realistic full-body tracking from sparse observations via joint-level modeling	ByteDance Inc, PICO	United States	—
11	Hmd-poser: On-device real-time human motion tracking from scalable sparse observations	ByteDance, PICO	China	—
12	Mobileposer: Real-time full-body pose estimation and 3d human translation from imus in mobile consumer devices	Carnegie Mellon University, University of Chicago, United States	United States	—
13	Loose inertial poser: Motion capture with IMU-attached loose-wear jacket	Cardiff University, Tsinghua University, Xiamen University	China, United Kingdom	**Influential**
14	Dynamic inertial poser (dynaip): Part-based motion dynamics learning for enhanced human pose estimation with sparse inertial sensors	Shanghai Jiao Tong University, University of Southern California	China, United States	**Influential**
15	Mocap everyone everywhere: Lightweight motion capture with smartwatches and a head-mounted camera	Seoul National University	South Korea	**Influential**
16	Physical non-inertial poser (pnp): Modeling non-inertial effects in sparse-inertial human motion capture	ETH Zurich, Tsinghua University	China, Switzerland	**Influential**
17	Ultra inertial poser: Scalable motion capture and tracking from sparse inertial sensors and ultra-wideband ranging	ETH Zürich	Switzerland	**Influential**
18	A unified diffusion framework for scene-aware human motion estimation from sparse signals	ShanghaiTech University	China	—
19	Stratified avatar generation from sparse observations	Ant Group, Penn State University, Pennsylvania State University	China, United States	—
20	Manikin: biomechanically accurate neural inverse kinematics for human motion estimation	ETH Zürich	Switzerland	—

No.	Citing paper	Citing institution(s)	Country	S2
21	Bodiffusion: Diffusing sparse observations for full-body human motion synthesis	Meta AI, Universidad de los Andes, Université Pierre et Marie Curie	Colombia, France, United States	—
22	I'm hoi: Inertia-aware monocular capture of 3d human-object interactions	Shanghai Advanced Research Institute, ShanghaiTech University, The Hong Kong University of Science and Technology	China, Hong Kong	—
23	Mocapose: Motion capturing with textile-integrated capacitive sensors in loose-fitting smart garments	DFKI, Germany and Berlin University of the Arts, Berlin, Germany, ETH Zurich, German Research Center for Artificial Intelligence (DFKI)	Germany, Switzerland	—
24	Ego4o: Egocentric human motion capture and understanding from multi-modal input	Google, Max Planck Institute for Informatics, University of California, Irvine Medical Center	Germany, United States	—
25	Marker data enhancement for markerless motion capture	Stanford University	United States	—
26	Fusing monocular images and sparse imu signals for real-time human motion capture	OPPO Research Institute, China, Tsinghua University	China	Influential
27	Ten steps to becoming a musculoskeletal simulation expert: A half-century of progress and outlook for the future	Stanford University, University of Ottawa	Canada, United States	—
28	Multimodal sensor fusion models for real-time exercise repetition counting with IMU sensors and respiration data	Soongsil University	South Korea	—
29	Egoposer: Robust real-time egocentric pose estimation from sparse and intermittent observations everywhere	ETH Zürich	Switzerland	—
30	MagShield: Towards Better Robustness in Sparse Inertial Motion Capture Under Magnetic Disturbances	Tsinghua University, Xiamen University	China	—

Showing the 30 most-cited of 143 independent citing papers.

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).

FOLLOW-UP WORK

Nymeria: A massive collection of multimodal egocentric daily motion in the wild

2024 · 92 citations (GS)

Field-normalised: 92 Semantic Scholar citations place it in the top 5% of Computer Science papers from 2024 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	GazeVLA: Learning Human Intention for Robotic Manipulation	Eastern Institute of Technology, Peking University, Shanghai Jiao Tong University	China, New Zealand	—
2	Robot Learning from Human Videos: A Survey	Shanghai Jiao Tong University, University of Cambridge	China, United Kingdom	—
3	Egocentric Gaze Estimation via Neck-Mounted Camera	The University of Tokyo	Japan	—
4	egoEMOTION: Egocentric Vision and Physiological Signals for Emotion and Personality Recognition in Real-World Tasks	ETH Zurich, ETH Zürich	Switzerland	—
5	Vibrun: Real-time unobtrusive gait analysis for treadmill running via footstep vibrations	University of Oklahoma, University of Tennessee at Knoxville	United States	—
6	Being-h0: vision-language-action pretraining from large-scale human videos	Peking University, Renmin University of China	China	—
7	Egom2p: Egocentric multimodal multitask pretraining	ETH Zürich, ETH Zürich, Zhejiang University	Switzerland	—
8	Ego4o: Egocentric human motion capture and understanding from multi-modal input	Google, Max Planck Institute for Informatics, University of California, Irvine Medical Center	Germany, United States	Influential
9	Egoposer: Robust real-time egocentric pose estimation from sparse and intermittent observations everywhere	ETH Zürich	Switzerland	—
10	Emhi: A multimodal egocentric human motion dataset with hmd and body-worn imus	PICO	—	—
11	Egomimic: Scaling imitation learning via egocentric video	Georgia Institute of Technology, Stanford University	United States	—
12	Bridging perspectives: A survey on cross-view collaborative intelligence with egocentric-exocentric vision	Nanjing University, The University of Tokyo, University of Oxford	China, Japan, United Kingdom	—
13	Rewind: Real-time egocentric whole-body motion diffusion with exemplar-based identity conditioning	Facebook, Imperial College London, KAIST	Germany, South Korea, United Kingdom	—
14	Scoping review of multimodal sentiment analysis and summarization: State of the art, challenges and future directions	ICMC-USP, Universidade de São Paulo	Brazil	—
15	St-think: How multimodal large language models reason about 4d worlds from egocentric videos	Chinese Academy of Sciences, University of Bristol	China, United Kingdom	—
16	EPFL-Smart-Kitchen: An Ego-Exo Multi-Modal Dataset for Challenging Action and Motion Understanding in Video-Language Models	EPFL	Switzerland	—
17	Egosim: An egocentric multi-view simulator and real dataset for body-worn cameras during motion and activity	ETH Zürich	Switzerland	—

No.	Citing paper	Citing institution(s)	Country	S2
18	Improving global motion estimation in sparse imu-based motion capture with physics	Tsinghua University	China	—
19	Intend to Move: A Multimodal Dataset for Intention-Aware Human Motion Understanding	The University of Tokyo	Japan	—
20	Zerowbc: Learning natural visuomotor humanoid control directly from human egocentric video	China Telecom, Northwestern Polytechnical University, Shanghai AI Laboratory	China	—
21	Mica: Multi-agent industrial coordination assistant	Hunan University, Karlsruhe Institute of Technology	China, Germany	—
22	HAGI: Head-assisted gaze imputation for mobile eye trackers	University of Stuttgart	Germany	**Influential**
23	Systematic comparison of projection methods for monocular 3D human pose estimation on fisheye images	Robert Bosch (Germany), RWTH Aachen University	Germany	—
24	Spatio-temporal llm: Reasoning about environments and actions	University of Illinois Urbana-Champaign	United States	—
25	In-N-On: Scaling Egocentric Manipulation with in-the-wild and on-task Data	UC San Diego	United States	—
26	Generating Attribute-Aware Human Motions from Textual Prompt	Peking University	China	—
27	Developing vision-language-action model from egocentric videos	Kyoto University, National Institute of Informatics, Sony Interactive Entertainment (United States)	Japan, United States	—
28	The monado slam dataset for egocentric visual-inertial tracking	CIFASIS, Munich Center for Machine Learning	Argentina, Germany	—
29	Group Inertial Poser: Multi-Person Pose and Global Translation from Sparse Inertial Sensors and Ultra-Wideband Ranging	ETH Zürich	Switzerland	—
30	EgoCHARM: Resource-efficient hierarchical activity recognition using an egocentric IMU sensor	Carnegie Mellon University, Meta Reality Labs	United States	—

Showing the 30 most-cited of 75 independent citing papers.

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).

FOLLOW-UP WORK

HMD2: Environment-Aware Motion Generation from Single Egocentric Head-Mounted Device

2025 · 25 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Estimating body and hand motion in an ego-sensed world	UC Berkeley, UT Austin	United States	—

No.	Citing paper	Citing institution(s)	Country	S2
2	Ego4o: Egocentric human motion capture and understanding from multi-modal input	Google, Max Planck Institute for Informatics, University of California, Irvine Medical Center	Germany, United States	—
3	EventEgo3D++: 3D Human Motion Capture from A Head-Mounted Event Camera: C. Millerdurai et al.	Augmented Vision, German Research Center for Artificial Intelligence (DFKI), Trippstadter Str. 122, Kaiserslautern, 67663 Rhineland-Palatinate Germany, Max Planck Institute for Informatics	Germany	—
4	FRAME: Floor-aligned Representation for Avatar Motion from Egocentric Video	Google (Switzerland), LIX, École Polytechnique/CNRS Institut Polytechnique de Paris Palaiseau France, Max Planck Institute for Informatics	Germany, Switzerland	—
5	Ground Reaction Inertial Poser: Physics-based Human Motion Capture from Sparse IMUs and Insole Pressure Sensors	Carnegie Mellon University, Keio University, Shanghai Jiao Tong University	China, Japan, United States	—
6	Rewind: Real-time egocentric whole-body motion diffusion with exemplar-based identity conditioning	Facebook, Imperial College London, KAIST	Germany, South Korea, United Kingdom	—
7	Group Inertial Poser: Multi-Person Pose and Global Translation from Sparse Inertial Sensors and Ultra-Wideband Ranging	ETH Zürich	Switzerland	—
8	Deep Sensorimotor Control by Imitating Predictive Models of Human Motion	UC Berkeley, University of California, Irvine Medical Center	United States	—
9	Hand-Aware Egocentric Motion Reconstruction with Sequence-Level Context	Seoul National University	South Korea	—
10	EgoForce: Robust Online Egocentric Motion Reconstruction via Diffusion Forcing	Seoul National University	South Korea	—
11	Egocentric Visibility-Aware Human Pose Estimation	PICO	—	—
12	Developing Privacy Frameworks for Motion Sensor Data in Next-Generation Wearable Devices	—	—	—
13	Uniegomotion: A unified model for egocentric motion reconstruction, forecasting, and generation	Panasonic Holdings Corporation, Salesforce, Stanford University	Japan, United States	Influential
14	From Pre-Rendered to Autonomous: A Systematic Review of AI-Driven Character Animation and Embodiment in Virtual Reality	University of Peloponnese	Greece	—
15	MotionGRPO: Overcoming Low Intra-Group Diversity in GRPO-Based Egocentric Motion Recovery	Nanyang Technological University, The Hong Kong University	China, Singapore	—

No.	Citing paper	Citing institution(s)	Country	S2
		versity of Science and Technology (Guangzhou)		
16	EGOCENTRIC VISION DATA FOR CONFINED SPACE DESIGN: OPPORTUNITIES, CHALLENGES, AND STRATEGIES	Korea Advanced Institute of Science and Technology	South Korea	—
17	Perceiving and Simulating Human-World Interactions for Egocentric Agents (2025)	Stanford University	United States	—
18	Vibrun: Real-time unobtrusive gait analysis for treadmill running via footstep vibrations (2025)	Izmir Kâtip Çelebi University, University of Oklahoma, University of Tennessee at Knoxville	Turkey, United States	—
19	Prime and Reach: Synthesising Body Motion for Gaze-Primed Object Reach (2025)	Keio University, University of Bristol	Japan, United Kingdom	—
20	HumanFlow--Diffusion-Driven MAV Navigation Among Humans via Tightly-Coupled Motion Tracking, Forecasting, and Control (2026)	ETH Zurich, Munich Center for Machine Learning	Germany, Switzerland	—

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 2

Claim — Contribution 2

The researcher developed a hybrid simulator identification framework for domain adaptation via adversarial reinforcement learning, subsequently extending this work to benchmark and augment rigid body contact models.

The researcher established a foundational contribution in simulation-based domain adaptation through the 2021 paper 'Simgan: Hybrid simulator identification for domain adaptation via adversarial reinforcement learning.' This core work appears to introduce a novel approach to aligning simulators with real-world dynamics using adversarial reinforcement learning techniques.

This line of work addresses the challenge of sim-to-real transfer by focusing on accurate physical modeling. The researcher expanded upon this foundation with follow-up studies, including a 2022 paper on data-augmented contact models and a 2023 benchmarking study. These titles suggest a progressive effort to refine and validate rigid body simulation components, indicating a sustained focus on improving the fidelity and reliability of physical simulations.

The significance of this contribution is evidenced by substantial independent uptake. The core paper has accumulated 96 citations, while the follow-up works have garnered 31 and 8 citations respectively. Notably, 88.9% of the scholar's total citing papers originate from independent researchers, demonstrating that this line of work has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 125 **· 3 flagged influential by Semantic Scholar**

CORE PAPER

Simgan: Hybrid simulator identification for domain adaptation via adversarial reinforcement learning

2021 · 96 citations (GS)

Field-normalised: 65 Semantic Scholar citations place it in the top 10% of Computer Science papers from 2021 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Universal controllers with differentiable physics for online system identification (2022)	—	—	—
2	Toward Actionable and Trustworthy Real-World Decision Making (2026)	Arizona State University	United States	—
3	A State-of-the-Art Survey of Adversarial Reinforcement Learning for IoT Intrusion Detection	—	—	—
4	Robotic disassembly for end-of-life products focusing on task and motion planning: A comprehensive survey	—	—	—
5	Integrating Machine Learning and Physics Simulation Methodologies for Creating Digital Twins of Humans and Robots	Brown University, Johns Hopkins University, Massachusetts Institute of Technology	United States	—
6	Achieving human level competitive robot table tennis	—	—	—
7	Autonomous advanced aerial mobility—An end-to-end autonomy framework for UAVs and beyond	Microsoft	United States	—
8	Domain randomization for sim2real transfer of automatically generated grasping datasets	Institut Systèmes Intelligents et de Robotique	France	—
9	What is the solution for state-adversarial multi-agent reinforcement learning?	Purdue University, University of Connecticut, University of Illinois Chicago	United States	—
10	A strategy transfer approach for intelligent human-robot collaborative assembly	Donghua University, Hong Kong Polytechnic University, The Hong Kong Polytechnic University	China, Hong Kong	—
11	Return augmented decision transformer for off-dynamics reinforcement learning	Duke University, Indiana University	United States	—
12	Exploring constrained reinforcement learning algorithms for quadrupedal locomotion	ETH Zurich	Switzerland	—
13	Easi: Evolutionary adversarial simulator identification for sim-to-real transfer	—	—	—
14	Digital battle: A three-layer distributed simulation architecture for heterogeneous robot system collaboration	National University of Defense Technology	China	—
15	Uncertainty-aware grounded action transformation towards sim-to-real transfer for traffic signal control	Arizona State University, West Windsor-Plainsboro High School South	United States	—
16	Learning nonprehensile dynamic manipulation: Sim2real vision-based policy with a surgical robot	University of Toronto	Canada	—
17	Learning to See with Less: A Survey on Computer Vision with Limited and Imperfect Data	Computer Science and Engineering, Kalinga Institute of Industrial Technology, Patia, Bhubaneswar, Odisha, 751024,	—	—

No.	Citing paper	Citing institution(s)	Country	S2
		India, North Carolina Agricultural and Technical State University		
18	Curriculum reinforcement learning via morphology-environment co-evolution	Southern University of Science and Technology, University of Maryland, University of Technology Sydney	Australia, China, United States	—
19	CDAMetaRL: Continuous Dynamics Adaptive Meta Reinforcement Learning	Shenzhen Technology University	China	—
20	Distributionally Robust Online Markov Game with Linear Function Approximation	The Chinese University of Hong Kong	Hong Kong	—
21	Zero-Shot Sim-to-Real Robot Learning: A Dexterous Manipulation Study on Reactive Catching	Rice University, Robotics and AI Institute	United States	—
22	Simulator Adaptation for Sim-to-Real Learning of Legged Locomotion via Proprioceptive Distribution Matching	Oregon State University	United States	—
23	Improving Image Classification Performance with Balanced Synthetic Data	—	—	—
24	InverseLight: Inverse Dynamics Enabling Policy Transfer with Limited Data for Traffic Signal Control	Tsinghua University	China	—
25	Learning to Perceive and Control for Robust Autonomy Across Aerial and Legged Platforms	UC Berkeley	United States	—
26	Intelligent Spectrum Coexistence in UAV-Enabled NextG Networks: Algorithms and Testing Framework	State University of New York at Buffalo	United States	—
27	MorphoGen: Evolving Robot Morphologies with Large Language Models	University of Warsaw	Poland	—
28	Sampling-based optimized adaptive discretization and its applications in robotics	Iowa State University	United States	—
29	Robust reinforcement learning with intrinsic stochasticity in real-time simulation	University of British Columbia	Canada	—
30	A survey on model-based reinforcement learning (2024)	Nanjing University, Polixir.ai, Shanghai Jiao Tong University	China	**Influential**

Showing the 30 most-cited of 88 independent citing papers.

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).

FOLLOW-UP WORK

Data-augmented contact model for rigid body simulation

2022 · 31 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Robot model identification and learning: A modern perspective	Seoul National University, University of Notre Dame	—	—
2	Integrating Machine Learning and Physics Simulation Methodologies for Creating Digital Twins of Humans and Robots	Brown University, Johns Hopkins University, Massachusetts Institute of Technology	United States	—
3	Tossingbot: Learning to throw arbitrary objects with residual physics	Google, Massachusetts Institute of Technology, Princeton University	United States	—
4	Computational Sensing, Understanding, and Reasoning: An Artificial Intelligence Approach to Physics-Informed World Modeling: B. Moya et al.	Arts et Métiers, CNRS@CREATE LTD., CNRS, 1 CREATE Way, Singapore, 138602, Singapore, ETSIAE, Polytechnic University of Madrid, C. de José Gutiérrez Abascal, 2, Madrid, 28006, Spain	France	—
5	Physics-integrated variational autoencoders for robust and interpretable generative modeling	HES-SO Genève	Switzerland	—
6	Learning rigid dynamics with face interaction graph networks	DeepMind	United Kingdom	—
7	Coercing machine learning to output physically accurate results	Stanford University	United States	—
8	On inverse inertia matrix and contact-force model for robotic manipulators at normal impacts	Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier	France	—
9	Adaptive barrier smoothing for first-order policy gradient with contact dynamics	Arizona State University	United States	—
10	Tossnet: Learning to accurately measure and predict robot throwing of arbitrary objects in real time with proprioceptive sensing	City University of Hong Kong, Hong Kong University of Science and Technology, Tencent	China, Hong Kong	—
11	Learning visual affordances for robotic manipulation	Princeton University	United States	—
12	Augmenting differentiable simulators with neural networks to close the sim2real gap	Google, University of Southern California	United States	—
13	PeRP: Personalized residual policies for congestion mitigation through co-operative advisory systems	Massachusetts Institute of Technology, University of Illinois Urbana-Champaign	United States	—
14	Long-horizon prediction and uncertainty propagation with residual point contact learners	Massachusetts Institute of Technology, MIT, MIT Computer Science and Artificial Intelligence Laboratory	United States	—
15	Automating Planar Object Singulation by Linear Pushing with Single-point and Multi-point Contacts.	University of California, Irvine Medical Center	United States	—
16	Automated acquisition of anisotropic friction	École de Technologie Supérieure, McGill University, University of Copenhagen	Canada, Denmark	—

No.	Citing paper	Citing institution(s)	Country	S2
17	Three dimensional reconstruction of botanical trees with simulatable geometry	NVIDIA Corporation, Stanford University	United States	—
18	D4W: Dependable Data-Driven Dynamics for Wheeled Robots	Shanghai Jiao Tong University, The University of Texas at Austin	China, United States	—
19	A Rigid Body Simulation Optimization Algorithm Based on Adaptive Update	East China Jiaotong University	China	—
20	Three dimensional reconstruction of botanical trees with simulatable geometry	Stanford University	United States	—
21	Sparse-Input Neural Network Augmentations for Differentiable Simulators	University of Southern California	United States	—
22	Combining Learning and Structure for Robotic Manipulation	Eberhard Karls Universität Tübingen	Germany	—
23	A numerical study of frictional contact	Laboratoire de Mécanique et Génie Civil	France	—
24	Tree Animation and Modeling Via Analytic Simulation and Image-based Reconstruction	Stanford University	United States	—
25	NeuralSim: Augmenting differentiable simulators with neural networks (2021)	Google, University of Southern California	United States	—
26	Graph network simulators can learn discontinuous, rigid contact dynamics (2023)	—	—	**Influential**
27	Fundamental challenges in deep learning for stiff contact dynamics (2021)	Carnegie Mellon University, University of Pennsylvania	United States	—
28	Physics-penalised regularisation for learning dynamics models with contact (2021)	—	—	—
29	Addressing Stiffness-Induced Challenges in Modeling and Identification for Rigid-Body Systems With Friction and Impacts (2023)	University of Pennsylvania	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).

FOLLOW-UP WORK

Benchmarking rigid body contact models

2023 · 8 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Learned neural physics simulation for articulated 3d human pose reconstruction	Anthropic, Google DeepMind	United Kingdom, United States	—
2	Multiscale Modeling and Data-Driven Life Prediction of Kinematic Interface Behaviors in Mechanical Drive Systems	Hebei University of Technology, Yanshan University	China	—
3	Physically Accurate Rigid-Body Dynamics in Particle-Based Simulation	University of Colorado Boulder	United States	—

No.	Citing paper	Citing institution(s)	Country	S2
4	Contact-constraint forces associated with the non-generalized coordinates and interpretation of their Lagrange multipliers	Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, 842 West Taylor Street, Chicago, IL, 60607, USA	—	—
5	Adaptive Abstractions for Robust Hierarchical Manipulation Planning	Massachusetts Institute of Technology	United States	—
6	UniOMA: Unified Optimal-Transport Multi-Modal Structural Alignment for Robot Perception	Vrije Universiteit Amsterdam	Netherlands	—
7	Forge: Force-guided exploration for robust contact-rich manipulation under uncertainty (2025)	MIT, NVIDIA, University of Southern California	United States	—
8	Co-design of magnetic soft robots with large deformation and contacts via material point method and topology optimization (2025)	Carnegie Mellon University	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 developed a framework for synthesizing biologically realistic human motion via joint torque actuation, subsequently extending this approach to anatomically detailed torso simulations.

CLAIM: The researcher established a method for generating biologically realistic human motion through joint torque actuation, as demonstrated in the 2019 core paper, and later expanded this work to include anatomically detailed simulations of the human torso in 2023.

ORIGINALITY: This line of work appears to address the challenge of creating physically accurate and biologically plausible motion synthesis. The progression from general joint torque actuation to specific, anatomically detailed torso simulations suggests a deepening focus on the mechanical and structural complexities of human movement, moving beyond simplified models to capture finer biological realism.

SIGNIFICANCE: The core paper has garnered 118 citations, indicating substantial engagement with the research community. Notably, 88.9% of the scholar's total classified citations originate from independent researchers, suggesting that this foundational work on torque-based motion synthesis has been widely adopted and built upon by peers outside the researcher's immediate circle, validating its broad impact and utility in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 111 **· 1 flagged influential by Semantic Scholar**

CORE PAPER

Synthesis of biologically realistic human motion using joint torque actuation

2019 · 118 citations (GS)

Field-normalised: 81 Semantic Scholar citations place it in the top 5% of Engineering papers from 2019 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Few-shot generative model for skeleton-based human action synthesis using cross-domain adversarial learning	NEC (Japan)	Japan	—
2	Physcap: Physically plausible monocular 3d motion capture in real time	Max Planck Institute for Informatics	Germany	—
3	A survey on deep learning for skeleton-based human animation	Inria, Univ Rennes, CNRS, IRISA, M2S Rennes France, Inria, Univ Rennes, CNRS, IRISA Rennes France	—	—
4	Allsteps: curriculum-driven learning of stepping stone skills	Aalto University, Stanford University, University of British Columbia Canada	Finland, United States	—
5	Curved crease origami and topological singularities enable hyperextensibility of L. olor	Stanford University	United States	—
6	MS-MANO: Enabling hand pose tracking with biomechanical constraints	Shanghai Jiao Tong University, Southeast University	China	—
7	Dep-rl: Embodied exploration for reinforcement learning in overactuated and musculoskeletal systems	Hertie Institute for Clinical Brain Research, Max Planck Institute for Intelligent Systems	Germany	—
8	Musclevae: Model-based controllers of muscle-actuated characters	Peking University	China	—
9	Real-time 3d target inference via biomechanical simulation	Aalto University, Yonsei University	Finland	—
10	Differentiable simulation of soft multi-body systems	Intel Labs, University of Maryland, College Park	China, United States	—
11	Virtual data generation for human intention prediction based on digital modeling of human-robot collaboration	KTH Royal Institute of Technology, Wuhan University of Technology	China, Sweden	—
12	Learning a family of motor skills from a single motion clip	Seoul National University	—	—
13	Predicting mid-air interaction movements and fatigue using deep reinforcement learning	Aalto University, German Research Center for Artificial Intelligence, Germany and Max-Planck Institute for Informatics, Germany, NVIDIA	Finland, United States	—
14	A survey on realistic virtual human animations: definitions, features and evaluations	Inria centre at the University Grenoble Alpes France, Inria, Univ Rennes, CNRS, IRISA, M2S Rennes France, Univ. Grenoble Alpes	France	—
15	Generative tweening: Long-term inbetweening of 3d human motions	Adobe Research, Pohang University of Science and Technology, University of Southern California	South Korea, United States	—

No.	Citing paper	Citing institution(s)	Country	S2
16	Machine learning approaches for 3d motion synthesis and musculoskeletal dynamics estimation: a survey	University of Miami, University of Patras	Greece, United States	—
17	Log2Motion: Biomechanical Motion Synthesis from Touch Logs	Aalto University & ELLIS Institute Finland, Helsinki, Finland, Leipzig University	—	—
18	Learning and exploring motor skills with spacetime bounds	Microsoft Research, Simon Fraser University	Canada, United States	—
19	Ostrichrl: A musculoskeletal ostrich simulation to study bio-mechanical locomotion	DeepMind, Imperial College London, Royal Veterinary College	United Kingdom, United States	—
20	A review of forward-dynamics simulation models for predicting optimal technique in maximal effort sporting movements	Loughborough University, Nottingham Trent University, University of Suffolk	United Kingdom	—
21	Explore to Learn: Latent Exploration Through Disentangled Synergy Patterns for Reinforcement Learning in Overactuated Control	Shenzhen Polytechnic University, University of Hong Kong, University of Macau	China	—
22	Simulating interaction movements via model predictive control	University of Bayreuth, University of Bergen	Germany, Norway	—
23	A deep reinforcement learning based approach towards generating human walking behavior with a neuromuscular model	Norwegian University of Science and Technology, Technical University of Darmstadt, University of Siegen	Germany, Norway	—
24	Motion recommendation for online character control	KAIST	South Korea	—
25	The effects of motor modularity on performance, learning and generalizability in upper-extremity reaching: a computational analysis	Stanford University	United States	—
26	a neural network model for efficient Musculoskeletal-Driven skin deformation	Stanford University, University of California, Irvine Medical Center	—	—
27	Discovering fatigued movements for virtual character animation	Aalto University, German Research Center for Artificial Intelligence, Germany and Max-Planck Institute for Informatics, Germany, German Research Center for Artificial Intelligence, Germany and Saarland University, Germany	Finland, Germany	**Influential**
28	Finite state machine-based motion-free learning of biped walking	Hanyang University	South Korea	—
29	Dep-snn-rl: Spiking neural networks reinforcement learning in musculoskeletal systems	Zhejiang Lab	China	—

No.	Citing paper	Citing institution(s)	Country	S2
30	BASH: Biomechanical Animated Skinned Human for Visualization of Kinematics and Muscle Activity.	Friedrich-Alexander-Universität Erlangen-Nürnberg	Germany	—

Showing the 30 most-cited of 109 independent citing papers.

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).

FOLLOW-UP WORK

Anatomically Detailed Simulation of Human Torso

2023 · 2 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	a neural network model for efficient Musculoskeletal-Driven skin deformation	Stanford University, University of California, Irvine Medical Center	—	—
2	Sflsh: Shape-dependent soft-flesh avatars	Universidad Rey Juan Carlos, Spain	—	—

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
Stanford University	United States	SCImago #18 · THE =5 · QS 3	58
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	24
Seoul National University	South Korea	SCImago #135 · THE =58 · QS =38	23
Shanghai Jiao Tong University	China	SCImago #10 · THE 40 · QS =47	23
Carnegie Mellon University	United States	SCImago #266 · THE 24 · QS 52	21
University of California, Irvine Medical Center	United States	—	19
Meta	United States	—	18
ETH Zürich	Switzerland	THE 11 · QS 7	17
Xiamen University	China	SCImago #275 · THE 251–300 · QS 341	16
Max Planck Institute for Informatics	Germany	SCImago #181	16
University of British Columbia	Canada	SCImago #144 · THE 45 · QS 40	15
Nanyang Technological University	Singapore	SCImago #137	14
ETH Zurich	Switzerland	THE 11 · QS 7	13
University of Pennsylvania	United States	SCImago #52 · THE 14 · QS 15	13

Institution	Country	World ranking	Citing papers
Georgia Institute of Technology	United States	SCImago #270 · THE =41 · QS =123	11

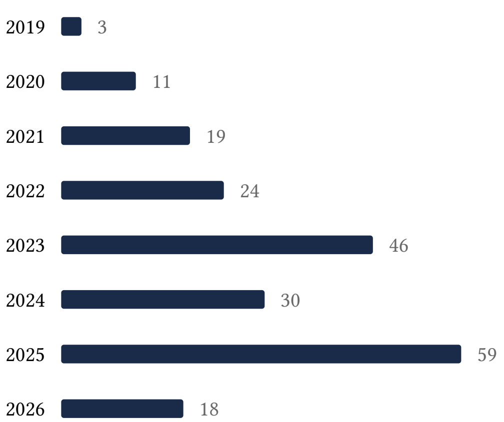
Geographic distribution of citing authors

Country	Citing papers
United States	224
China	174
Germany	57
United Kingdom	47
Canada	45
South Korea	39
Switzerland	38
Singapore	18
Spain	16
Hong Kong	16
France	15
Japan	15

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	Transformer inertial poser: Real-time human motion reconstruction from sparse imus with simultaneous terrain generation	238	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 2	Simgan: Hybrid simulator identification for domain adaptation via adversarial reinforcement learning	125	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 3	Synthesis of biologically realistic human motion using joint torque actuation	111	8 CFR 204.5(i)(3) — Outstanding Researcher