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Sean Hardesty Lewis

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Education

Cornell Tech (Cornell University), MS in Information Systems — **New York City, New York**
Technion — Israel Institute of Technology, MS in Information Science — August 2024 – May 2026

- Jacobs Certificate of Accomplishment in Computer Science
- GPA: 4.0
- Relevant coursework: Deep Learning, Machine Learning, Computer Vision, Trustworthy AI

The University of Texas at Austin, BS in Mathematics — **Austin, Texas**

- GPA: 3.7 — August 2022 – May 2024
- Relevant coursework: Advanced Calculus, Real Analysis, Scientific Computation, Software Design

Texas A&M University, BS in Computer Science* — **College Station, Texas**

- GPA: 4.0
- *Incomplete, transferred to UT Austin — August 2021 – May 2022

Honors & Awards

Merit Scholarship 2024
- Awarded to exceptional graduate students.

Hispanic Scholarship Fund (HSF) Scholar 2024
- Awarded to exceptional Hispanic students in higher education.

Fuller Endowed Scholarship 2023
- Recognized for academic excellence during undergraduate studies.

Merner Scholarship 2022
- Awarded for outstanding academic performance.

Eagle Scout, AP Scholar with Distinction, Spanish V Academic Award 2020
- Awards before enrollment in higher education.

Funding

City of Austin Grant 2024
- Won $100,000 from CoA for developing AI-assisted multilingual emergency preparedness chatbot.

Dell Technologies Grant 2023
- Won $30,000 in form of two $15,000 RTX 6000 Ada Dell workstations to develop digital twins.

Professional Experience

Graduate Research Assistant — Urban Tech Hub, Cornell Tech — New York City, New York
- Developed data-driven climate resilience AI applications for NYC nonprofits. — August 2024 – Present
- Created city-scale semantic map system for natural-language search; advised by Dr. Wendy Ju.
- Built full-stack interfaces & applications (AI/ML/NLP) for Urban Tech Hub; advised by Dr. Anthony Townsend.

Smart City Research Advisor — Urban Information Lab, UT Austin — Austin, Texas
- Took on an advisory role for directing research in the lab and leading development. — August 2024 – Present
- Authored papers on trustworthy, multilingual, and retrieval-augmented civic AI with Dr. Junfeng Jiao.

Software Engineer Intern — IBM San Jose, California

- Built MoE chatbot integrated with IBM DB2, improving processing time by 20%. May 2024 – August 2024
- Presented to Senior VPs of Software; secured executive support for continued development.

Undergraduate Researcher — Urban Information Lab, UT Austin Austin, Texas

- Built 200 GB harmonized dataset from 200+ U.S. cities for LLM fine-tuning. August 2022 – May 2024
- Lead developer on $100 k grant for multilingual, grounded RAG chatbot for emergency communication.
- Secured $30 k sponsorship from Dell Technologies (two ADA-6000 workstations).

Teaching Experience

Teaching Assistant, Deep Learning, Cornell University August 2025 – Present

- Supported instruction and course operations with Dr. Hadar Elor for ∼80 graduate students.
- Designed weekly quizzes and homework assignments aligned with course objectives and current topics.
- Graded programming assignments, quizzes, and projects.

Teaching Assistant, Break Through Tech AI, Cornell University May 2025 – August 2025

- Taught ML with Dr. Mohammad Al-Saad to women and other underrepresented groups.
- Delivered weekly hands-on labs and provided 1-on-1 mentoring for ∼60 undergraduate AI Fellows.
- Built workshops and assignments to help launch the initiative's largest cohort (∼1000 Fellows).

Summer Academy Program Assistant, Department of Computer Science, University of Texas at Austin June 2022 – August 2022

- Co-taught three tracks: iOS/Swift (Xcode), Arduino C++ with PID, and HTML5/JS/Phaser for ∼60 students.
- Led Arduino robotics labs (C++/PID) with Dr. Justin Hart, guided teams to program autonomous navigation.
- Taught HTML5/JS game development with Phaser with Dr. Sarah Abraham, mentored projects to deployment.

Peer-Reviewed Publications

Minecraft to 3D: A Pipeline for High-Fidelity Reconstruction of Minecraft Worlds August 2025

Sean Hardesty Lewis

10.1145/3721250.3743044
ACM Special Interest Group on Graphics and Interactive Techniques (SIGGRAPH 2025)
End-to-end pipeline for reconstructing Minecraft worlds as high-fidelity, interactive 3D scenes.

StreamTwin: A Decentralized Digital Twin via Crowdsourced Sensing and Browser-Based Edge Computation July 2025

Sean Hardesty Lewis, Junfeng Jiao, Yiming Xu, Jihyung Park, Connor Phillips

Under Review
AAAI 2026, Innovative Applications of AI (IAAI)
Browser-based edge compute fuses detections from public webcams into a city-scale digital twin.

SafeMate: Providing Reliable, Step-by-Step Emergency Assistance with a Guideline-Grounded Agent May 2025

Junfeng Jiao, Jihyung Park, Yiming Xu, **Sean Hardesty Lewis**, Lucy Atkinson, Kristen Sussman

Under Review
AAAI 2026, Innovative Applications of AI (IAAI)
Retrieval-grounded assistant that turns official emergency guidance into actionable, step-by-step instructions.

OpenCityCorpus: A Large-Scale, Harmonized, and LLM-Ready Corpus of Urban Data for Scientific Research May 2025

Junfeng Jiao, **Sean Hardesty Lewis**, Yiming Xu, Jihyung Park, Connor Phillips

Under Review
AAAI 2026, Artificial Intelligence for Social Impact (AISI)
∼200 GB harmonized corpus spanning 200+ cities, with a schema-harmonization pipeline.

Workshop Publications

From Walled Gardens to Open Streets: A Pipeline for Cross-City Data Harmonization August 2025

Sean Hardesty Lewis, Junfeng Jiao, Yiming Xu, Jihyung Park, Connor Phillips

Under Review
NeurIPS 2025 UrbanAI Workshop
A novel workflow that harmonizes urban data from Socrata, ArcGIS, and CKAN.

Posters & Invited Talks

Specialization Research Projects - Invited Panelist at Cornell Tech (panel chaired by Dr. Deborah Estrin) September 2025

Natural Language Processing Workshop - Break Through Tech AI Workshop July 2025

Slides

AI Emergency Communication: Deterministic Models for Critical Information - 2nd Annual Smart Cities and Generative AI Symposium (Good Systems) May 2024

Slides

Finding the Optimal Way Out: A Study on Bellman's Lost in a Forest Problem - Math for All Conference April 2024

Slides

Using Generative AI for Digital Planning - Good Systems Symposium March 2024

Poster

Multilingual AI-Assisted Emergency Preparedness - Good Systems Symposium March 2024

Poster

Digital Planning for Sustainable Urban Future - Utrecht University, Netherlands (audience included Dr. Michael Batty) January 2024

Slides

AI-Powered Insights: Extracting Value from Complex Data Ecosystems - 1st Annual Smart Cities and Generative AI Symposium (Texas Advanced Computing Center) August 2023

Slides

Open Source Tools & Infrastructure

StreamTwin (Decentralized Digital Twin) May 2025 – Present

- Developed browser-based edge compute system which fuses crowdsourced webcam detections into a live world model via an Aggregate Spatiotemporal Cache (ASC), no raw video leaves clients.
- Reconstructs scenes with 0.73 IoU on 10 live cameras while cutting per-stream bandwidth from 5 Mbps to 20 kbps ($>20\times$) with interactive traffic visualization.

Minecraft to 3D May 2025 – Present

- Trained 3D CNN and created end-to-end pipeline to upscale voxel worlds to interactive high-resolution environments, exports to Blender, Godot, Unity, and Unreal Engine.
- Network achieves 97.8% mean IoU on isolated structures with processing a 1 km² map (about 65 million blocks) taking 147s on RTX 4090 and never exceeding 3.2 GB of system memory due to sparse-voxel octree.

OpenCityCorpus March 2023 – Present

- Harmonized ~200 GB, 200+ city corpus from Socrata/ArcGIS/CKAN data sources into unified, semantically

enriched schema for LLM training and RAG.
- Created queryable dataset with documentation and loaders.

SafeMate September 2024 – July 2025
- Led development on $100 k City of Austin grant for MCP-based, retrieval-augmented agent that routes to tools for policy retrieval, checklist generation, and structured summarization of trusted sources.
- Outperforms GPT-4o and GPT-3.5 on emergency preparedness queries (correctness, groundedness, completeness, relevance, fluency).

OpenCityAI March 2023 – August 2024
- Built ingestion + RAG pipeline over combined city portal data, retrieving citation-backed answers.
- Outperforms Google Bard and Microsoft Bing on city-data QA, with higher answer accuracy and groundedness.

SmartCityData August 2022 – February 2023
- Cross-city search and linking for municipal open-data portals across heterogeneous datasets.
- Normalizes schemas, ranks relevance, and visualizes coverage to reduce discovery friction.

Professional Service & Community Involvement

Member, EAAMO Urban Data Science Working Group August 2025 — Present
- Contributed to research discussion on data harmonization and digital twins.

President, Cornell Game Development Club August 2024 — Present
- Directed strategic planning and execution of club, fostering a collaborative environment for game development.
- Organized and facilitated industry-focused workshops, hackathons, and networking events.

SuperMaker, Cornell Tech Maker Lab August 2024 — Present
- Coordinated workshops and mentorship programs for aspiring makers and creatives.
- Organized monthly events to foster collaboration between students and industry professionals.

Mentor, Macaulay Honors Datathon (CUNY) September 2025
- Guided teams as they worked with MTA datasets to solve real-world urban challenges.
- Provided technical guidance, feedback on approaches, and helped participants create effective solutions.

Reviewer, NeurIPS 2025 Workshops: Reach & Limits of AI for Scientific Discovery, Structured Probabilistic Inference & Generative Modeling August 2025 — September 2025
- Reviewed submissions for NeurIPS 2025 Workshops (AI4Science, SPIGM).

Technology Officer, Laurel Cooperative August 2023 — May 2024
- Managed technology operations, including maintenance, website creation, and event coordination.
- Organized collective house meetings in leadership role, overseeing decision-making processes, and resolving conflicts through consensus-based methods. Helped onboard new members into collaborative culture.

Skills

Programming: Python, C++, C#, JavaScript, TypeScript, Java, HTML, CSS, SQL, XML, Bash, R

Tools: Linux, Visual Studio, Cloudflare, Unreal/Unity/Godot, PyTorch, Firebase, TensorFlow, Flask, Docker, Git, Blender, OSRM, AWS, Stata, ArcGIS, Selenium, Scrapy, WebRTC

Languages: English (Fluent), Spanish (Fluent), Japanese (Intermediate)

Personal Projects

Patchwork Beast (Team) February 2023 — May 2023
- Developed an artistic story-driven indie game about environmental destruction due to industrialization.
- Presented at UT Austin Digital Demo Day 2023, GDC² 2024, and SXSW 2025 GDC².
- Won "Best Art" award at SXSW 2025 GDC².