Aaron Appelle

Ph.D. Candidate
Pratt School of Engineering
Duke University

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EDUCATION

Ph.D. Civil and Environmental Engineering, Duke University (Expected May 2026)
Advisor: Jerome P. Lynch
GPA: 3.95/4.0

M.S. Computer Science, Duke University, (Expected May 2026)
GPA: 4.0/4.0

M.S. Civil and Environmental Engineering, Stanford University (April 2021)
GPA: 3.97/4.0

B.S. Civil Engineering, Columbia University (May 2018)
GPA: 3.83/4.0 *cum laude*

INDUSTRY

Google X (The Moonshot Factory)

AI Resident (Aug 2024 - Apr 2025)

Built and trained generative models for architectural design conditioned on physical and performance constraints

Co-inventor on 3 US patents (pending public release)

RESEARCH

Duke University (prev. U-Mich)

Graduate Research Assistant (Jul 2021 - Present)

Laboratory of Intelligent Systems Technology
Advisor: Jerome P. Lynch

Stanford University

Graduate Research Assistant (Dec 2020 - Mar 2021)

Structures as Sensors Lab
Advisor: Hae Young Noh

École polytechnique fédérale de Lausanne, EPFL

Fulbright Scholar, U.S. Student Program (Sep 2018 - Aug 2019)

Earthquake Engineering and Structural Dynamics Lab
Advisor: Katrin Beyer

Columbia University

Undergraduate Research Assistant (Jan 2017 - May 2018)

Stochastic Engineering Dynamics Lab
Advisor: Ioannis Kougioumtzoglou

Papers

2025 A. Appelle, J. P. Lynch, "Evaluating Video Models as Simulators of Multi-Person Pedestrian Trajectories," arXiv preprint arXiv:2510.20182, 2025. [Paper] [*Preprint, under review*]

2025 A. Appelle, J. P. Lynch, "Can Image-To-Video Models Simulate Pedestrian Dynamics?" in *ICML 2025 Workshop on Building Physically Plausible World Models*, July 2025. [Paper]

2025 A. Appelle, L. Salvino, J. P. Lynch, "Automated and Scalable Footstep Vibration-Based Pedestrian Localization in Built Environments Using Deep Learning," *Journal of Computing in Civil Engineering*, vol. 40, no. 1, p. 04025131, 2026. [Paper]

2025 E. Stach, A. Appelle, J. P. Lynch, L. Salvino, "Embedded sensing system for shipboard damage control scenarios," Proceedings of *SPIE Smart Structures + NDE*, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2025, vol. 13435, p. 134350Y, 2025. [Paper]

2024 A. Appelle, L. Salvino, J. P. Lynch, "Pedestrian footstep localization using a deep convolutional network for time difference of arrival estimation," Proceedings of *SPIE Smart Structures + NDE*, Conference on Nondestructive Characterization and Monitoring of Advanced Materials, Aerospace, Civil Infrastructure, and Transportation XVIII, 129500H (9 May 2024). [Paper]

2023 A. Appelle, L. Salvino, Y.-A. Lin, T. Pierce, E. Noble, G. Draughon, K. J. Loh, and J. P. Lynch, "Integration of Wearable and Ambient Sensors towards Characterization of Physical Effort," in The 9th *Asia-Pacific Workshop on Structural Health Monitoring* (9APWSHM), Mar. 2023, pp. 300–307. [Paper]

2023 A. Appelle, Y.-A. Lin, E. Noble, L. Salvino, K. J. Loh, and J. P. Lynch, "Wearable Sensor Platform to Monitor Physical Exertion Using Graphene Motion Tape," in *European Workshop on Structural Health Monitoring*, 2023, pp. 894–904. [Paper]

2020 R. Hoult, A. Appelle, J. Almeida, and K. Beyer, "Seismic performance of slender RC U-shaped walls with a single-layer of reinforcement," *Engineering Structures*, vol. 225, p. 111257, Dec. 2020, [Paper]

2019 R. D. Hoult, A. Appelle, J. P. Almeida, and K. Beyer, "Experimental Tests of Thin RC U-shaped Walls with a Single Layer of Reinforcement," in *Australian Earthquake Engineering Conference*, 2019.

Presentations

2024 A. Appelle, L. Salvino, J.P. Lynch, "Pedestrian footstep localization using a deep convolutional network for time difference of arrival estimation," in *SPIE Smart Structures + NDE*, 2024. [Available Online]

2023 A. Appelle, L. Salvino, Y.-A. Lin, T. Pierce, E. Noble, G. Draughon, K. J. Loh, and J. P. Lynch, "Integration of Wearable and Ambient Sensors towards Characterization of Physical Effort," in 9th *Asia Pacific Workshop on Structural Health Monitoring*, 2023

2022 A. Appelle, Y.-A. Lin, E. Noble, L. Salvino, K. J. Loh, and J. P. Lynch, "Wearable Sensor Platform to Monitor Physical Exertion Using Graphene Motion Tape," in *European Workshop on Structural Health Monitoring*, Palermo, Italy, June 6, 2022.

2019 R. Hoult, A. Appelle, J. Almeida, and K. Beyer (2019). "Instability of a thin U-shaped wall with a Single Layer of Reinforcement," on VIII *National Congress on Earthquake Engineering*, Cali, Colombia, May 29, 2018.

2018 R. Hoult, A. Appelle, J. Almeida, and K. Beyer (2018). "Recent Building Typology puts Colombia at Risk? From Large-scale Structural Laboratory Tests to City-scale Assessment," in *2018 St. Gallen Research Slam*, Switzerland, Dec 19, 2018.

Posters and Abstracts

2025 A. Appelle, J. P. Lynch, “Can Image-To-Video Models Simulate Pedestrian Dynamics?” in *ICML 2025 Workshop on Building Physically Plausible World Models*, Vancouver, Canada, July 2025. [Poster]

2024 A. Appelle, L. Salvino, J.P. Lynch, “Multiple Pedestrian Localization From Footstep Vibrations Using CNNs and Automatic Data Labeling,” in Duke AI Day, Durham, NC, USA, June 7, 2024. [Poster]

2018 A. F. Psaros, O. Brudastova, A. Appelle, I. A. Kougioumtzoglou, and G. Malara, "Nonlinear system stochastic response determination under non-white and non-Gaussian excitation via the Wiener Path Integral technique," in *13th World Congress in Computational Mechanics & 2nd Pan American Congress on Computational Mechanics*, New York, NY, Jul. 2018. [Abstract]

PROJECTS

Semi-Supervised Image Classification for Post-Earthquake Damage Assessment (Outstanding Project Award)

Stanford University, CS 230 Deep Learning, 2021

Python (Tensorflow, Keras, scikit-learn, NumPy, Pandas) [Code]

Edge Computing Architecture for Multi-Person Detection and Tracking

Duke University, CS 590 Edge Computing, 2022

Python (Pytorch), CUDA, C, NVIDIA Jetson

Predicting Evacuation Location for Disaster Recovery Modeling

Stanford University, CS 229 Machine Learning, 2021

Python (Pytorch, scikit-learn, NumPy, Pandas)

HONORS AND AWARDS

2022 Best Poster Award, Pratt Graduate Student Poster Session, Duke University

2019 Fulbright US Student Program – Independent Research

2018 Swiss Government Excellence Scholarship

2018 Tullio J. Borri Award in Civil Engineering (Columbia University)

2018 Tau Beta Pi – National Engineering Honor Society

2017 Happold Foundation Student Scholarship in Structural Engineering

2017 American Council of Engineering Companies (ACEC) Scholarship

2016 American Society of Civil Engineers (ASCE) Scholarship

TEACHING

CEE 690, Data Science and Machine Learning in Science and Engineering (Duke University)

Teaching Assistant (Fall 2025)
Instructor: David Carlson

EGR 305, Engineering Systems Optimization and Economics (Duke University)

Teaching Assistant (Fall 2023)
Instructor: Mark Borsuk

LEADERSHIP

Engineering Graduate Student Council, Duke University

President (2023-2024)
Representative (2022-2023)

Graduate and Professional Student Government, Duke University

Senator for Pratt School of Engineering (2023-2024)

Engineering Student Council, Columbia University

Representative (2017-2018)

Engineers Without Borders, Columbia University

Program Manager, pedestrian footbridge project in Morocco (2016-2017)