Andrew Katz

Associate Professor of Engineering Education, Virginia Tech

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EDUCATION

2015–2019 **Ph.D., Engineering Education**, Purdue University, West Lafayette, IN
Dissertation: *An Inquiry into the Nature and Causes of the State of US Engineering Ethics Education*
Committee: Donna Riley (chair), Joyce Main, Alice Pawley, Brent Jesiek, Indira Nair (external, Carnegie Mellon University)

2010–2012 **M.Eng., Civil Engineering**, Texas A&M University, College Station, TX
Concentration: environmental engineering
Final paper: *A Synthesis of the Epigenetic Effects of Endocrine Disrupting Compounds in Wastewater Treatment Plant Effluent*

2005–2009 **B.S., Chemical Engineering**, ***magna cum laude***, Tulane University, New Orleans, LA
Concentration: biology

ACADEMIC APPOINTMENTS

2025– **Associate Professor of Engineering Education**, Department of Engineering Education, Virginia Tech, Blacksburg, VA

2024– **Assistant Department Head for Graduate Programs**, Department of Engineering Education, Virginia Tech, Blacksburg, VA

2019–2025 **Assistant Professor of Engineering Education**, Department of Engineering Education, Virginia Tech, Blacksburg, VA

2015–2019 **Research Assistant**, School of Engineering Education, Purdue University, West Lafayette, IN
Project: *Characterizing Mental Models of Engineering Ethics Education*

Prior Professional Experience

2013–2015 **Physics Teacher**, Jesuit College Preparatory School of Dallas, Dallas, TX

2013 **Environmental Engineer**, Research Triangle Institute, Research Triangle Park, NC

2012 **Research Assistant**, Gillings School of Global Public Health, UNC–Chapel Hill, Chapel Hill, NC
Project: *Impacts of Inhalation Exposure to Exhaust Emissions on Markers of Lung Epithelial Injury*

2009–2010 **Research Assistant**, Health Sciences Center, West Virginia University, Morgantown, WV
Project: *Dysregulation of Mitochondrial Function Mediated by Mitofilin in Association with Diabetic Cardiomyopathy*

2007–2009 **Research Assistant**, Department of Chemical & Biomolecular Engineering, Tulane University, New Orleans, LA
Project: *Injury Signaling and Mesenchymal Stem Cell Migration*

HONORS AND AWARDS

2024–2029 **CAREER Award** — National Science Foundation
Minds and Machines: Exploring Engineering Faculty Member Mental Models of Generative AI and Instructional Decisions

2024–2025 **Policy Network Fellowship** — Institute for Society, Culture, and Environment, Virginia Tech

2024 **Faculty Innovation Fellowship** — Technology-enhanced Learning & Online Strategies, Virginia Tech

2023 **Division Best Paper Award** — Engineering Ethics Division, ASEE Annual Conference
Pushing Ethics Assessment Forward in Engineering: NLP-Assisted Qualitative Coding of Student Responses

2022 **Division Best Paper Award** — Women in Engineering Division, ASEE Annual Conference
Collateral Damage: Investigating the Impacts of COVID on STEM Professionals with Caregiving Responsibilities

2021 **Division Best Paper Award** — Design in Engineering Education Division, ASEE Annual Conference
Engineering Ethics in Engineering Design Courses: A Preliminary Investigation

2021 **Editor's Choice Award** — Journal of Civil Engineering Education
Civil Engineering Students' Beliefs about Global Warming and Misconceptions about Climate Science

2019 **Division Best Paper Runner-Up** — Industrial & Systems Engineering Division, ASEE Annual Conference
Monetizing Life May Be the Ethical Thing to Do

2019 **K. Patricia Cross Future Leaders Award** — American Association of Colleges & Universities

2016–2019 **Graduate Research Fellowship** — National Science Foundation
Faculty Mental Models of Engineering Ethics Education & Student Moral Development

2011 **Terracon Fellowship** — Texas A&M University

2010–2012 **NSF WATER Fellowship** — Texas A&M University & National Science Foundation

2008 **Randall K. Nicholls Award** — Tulane University
Awarded to two rising seniors identified by the dean and faculty as having special talents

2005–2009 **Dean's Honor Scholarship** — Tulane University
Tulane's signature full-tuition scholarship, awarded across all academic areas

RESEARCH FUNDING

External

2025–2028
Developing the Engineering Workforce: Examining Faculty Beliefs to Connect School to Work
National Science Foundation · $240,463 · Co-PI

2025–2028
Collaborative Research: The Engineering Master's Workforce: Leveraging Natural Language Processing Techniques to Understand Employer Demands and Student Goals
National Science Foundation · $174,616 · PI

2024–2029
CAREER: Minds and Machines: Exploring Engineering Faculty Member Mental Models of Generative AI and Instructional Decisions
National Science Foundation · $592,712 · PI

2023–2026
Design for Sustainability: How Mental Models of Social-Ecological Systems Shape Engineering Design Decisions
National Science Foundation · $840,373 · PI

2023–2024
Operationalizing, Validating, and Scaling Health Systems Citizenship Assessment in Undergraduate Medical Education
National Board of Medical Examiners · $149,926 · Co-PI

2022–2023
EAGER: NLPTREE: Natural Language Processing for Teaching and Research in Engineering Education
National Science Foundation · $299,647 · PI

2021–2023
Research: FAME: Faculty Assessment Mental Models in Engineering Education
National Science Foundation · $349,157 · PI

2021–2022
Collaborative Research: Intersections between Diversity, Equity, and Inclusion and Ethics in Engineering
National Science Foundation · $49,339 · PI

Internal

2026
How Does GAI Affect the Value and Range of Design Expertise, and How Should We Assess It?
Virginia Tech Center for Future Work Places and Practices · $10,000 · Co-PI (PI: Yoon Jung Choi)

2024
Using Large Language Models and Generative AI to Scale Qualitative Data Analysis
Virginia Tech Academy of Data Science · $10,000 · PI

2023
Exploring Public Perceptions and Attitudes toward Generative AI in Education: A Mixed Methods Study of Social Media and Educators
4-VA · $15,000 · PI

2023
Unpacking the Ethical Dilemmas of Generative AI: An Exploratory Study of Public Discourse
Virginia Tech Institute for Society, Culture, and Environment · $11,000 · PI

2022
COVID-19 & Climate Change: Mapping the Effects of Compounding Crisis in the Coastal Zone
Virginia Tech Center for Coastal Studies · $15,000 · Co-PI

PUBLICATIONS

Names in **bold** indicate the author; † marks a student advisee. Items are numbered oldest to newest within each category, so numbers remain stable as work is added.

Refereed Journal Articles

J26 Gerhardt†, M., Sun, Y.-X. S., **Katz**, **A.**, Deters, J. R., Borrego, M., Knight, D. B., Clements, H. R., & Budhathoki, R. (2026). Decade-long analysis of skills across 1 million graduate-level job advertisements. *Trends in Higher Education*, *5*(4), 119.

J25 Grohs, J. R., Mutcheson, R. B., Karp, N., **Katz**, **A.**, Lane, H., Musick, D., Norris, M. B., Parker, S., & Gonzalo, J. (2026). Systems thinking in US medical education: Relevance and a conceptual framework to scaffold learning and assessment. *Systems*, *14*(6), 635.

J24 **Katz**, **A.**, Fleming, G. C., & Main, J. B. (2026). Thematic analysis with open-source generative AI and machine learning: A new method for inductive qualitative codebook development. *Humanities and Social Sciences Communications*, *13*(1), 209.

J23 Menon, M., Paretti, M. C., Case, J. M., & **Katz**, **A. S.** (2026). Understanding instructor decision-making in engineering education for sustainable development: A comparison of institutions in Denmark and the United States. *European Journal of Engineering Education*, *51*(4), 935–953.

J22 Norris, M. B., Grohs, J. R., Mutcheson, R. B., Karp, N., **Katz**, **A.**, Musick, D., Lane, H., Parker, S., & Gonzalo, J. (2026). Understanding health systems thinking in medical education: Qualitative interviews with expert clinicians. *BMC Medical Education*, *26*(1), 355.

J21 Anakok†, I., **Katz**, **A.**, Chew, K. J., & Matusovich, H. (2025a). Leveraging generative text models and natural language processing to perform traditional thematic data analysis. *International Journal of Qualitative Methods*, *24*, 16094069251338898.

J20 Cilsalar-Sagnak, H., Anakok†, I., & **Katz**, **A.** (2025). Curriculum comparison: Chemical and mechanical engineering education in the United States and Turkey. *Australasian Journal of Engineering Education*, *30*(1), 62–79.

J19 Drinkwater Gregg, K., Ryan, O., **Katz**, **A.**, Huerta, M., & Sajadi, S. (2025). Expanding possibilities for generative AI in qualitative analysis: Fostering student feedback literacy through the application of a feedback quality rubric. *Journal of Engineering Education*, *114*(3), e70024.

J18 Kim, D., & **Katz**, **A.** (2025). Engineering students' interests in nonprofit and public policy careers: Applying a data-driven approach to identifying contributing factors. *Journal of Engineering Education*, *114*(1), e20620.

J17 Ross†, A., & **Katz**, **A.** (2025). Using generative AI for large-scale qualitative analysis of social media posts to understand why people leave computer science. *Journal of Engineering Education*, *114*(4), e70036.

J16 Webb, M., Singh, H., Inman, R., Baniya, S., & **Katz**, **A.** (2025). Advancing qualitative analysis in professional disaster and risk communication: A comparative study of an OpenAI ChatGPT 3.5 model-enabled method for processing complex public discourse. *International Journal of Disaster Risk Reduction*, *130*, 105835.

J15 Yuan, C., Rossi, R., **Katz**, **A.**, & Eldardiry, H. (2025). A reinforcement learning framework for N-ary document-level relation extraction. *IEEE Transactions on Big Data*, *11*(2), 512–523.

J14 Fleming, G. C., Klopfer, M., **Katz**, **A.**, & Knight, D. (2024). What engineering employers want: An analysis of technical and professional skills in engineering job advertisements. *Journal of Engineering Education*, *113*(2), 251–279.

J13 Griesinger†, T., Reid, K., Knight, D., **Katz**, **A.**, & Somers, J. (2024). Inspiring sustainability in undergraduate engineering programs. *Sustainability*, *16*(12), 5026.

J12 Hess, J. L., Lin, A., Whitehead, A., & **Katz**, **A.** (2024). How do ethics and diversity, equity, and inclusion relate in engineering? A systematic review. *Journal of Engineering Education*, *113*(1), 143–163.

J11 **Katz**, **A.**, Gerhardt†, M., & Soledad, M. (2024). Using generative text models to create qualitative codebooks for student evaluations of teaching. *International Journal of Qualitative Methods*, *23*, 16094069241293283.

J10 Johri, A., **Katz**, **A. S.**, Qadir, J., & Hingle, A. (2023). Generative artificial intelligence and engineering education. *Journal of Engineering Education*, *112*(3), 572–577.

J9 **Katz**, **A.**, Main, J. B., Struck Jannini, A., & Knight, D. (2023). Special report: The research topics addressed and research methods applied in the *Journal of Engineering Education* (1993–2022). *Journal of Engineering Education*, *112*(4), 852–860.

J8 **Katz**, **A.**, & Main, J. (2022). Applying concepts from political science and economics to advance the study of engineering education. *Studies in Engineering Education*, *3*(1), 28–52.

J7 Szoke, M., **Katz**, **A.**, Borgoltz, A., & Devenport, W. J. (2022). Development of hybrid laboratory sessions during the COVID-19 pandemic. *Advances in Engineering Education*.

J6 Brozina, C., **Katz**, **A.**, & Johri, A. (2021). Taking stock: An analysis of IJEE publications from 1996–2020 to examine impact and coverage of topics. *International Journal of Engineering Education*.

J5 Milovanovic, J., Shealy, T., & **Katz**, **A.** (2021). Higher perceived design thinking traits and active learning in design courses motivate engineering students to tackle energy sustainability in their careers. *Sustainability*, *13*(22), 12570.

J4 Shealy, T., **Katz**, **A.**, & Godwin, A. (2021). Predicting engineering students' desire to address climate change in their careers: An exploratory study using responses from a U.S. national survey. *Environmental Education Research*, *27*(7), 1054–1079.

J3 Shealy, T., **Katz**, **A.**, Godwin, A., & Bell, M. (2021). Civil engineering students' beliefs about global warming and misconceptions about climate science. *Journal of Civil Engineering Education*, *147*(4), 04021011.

J2 **Katz**, **A.**, Reid, K., Riley, D., & Van Tyne, N. (2020). Overcoming challenges to enhance a first year engineering ethics curriculum. *Advances in Engineering Education*.

J1 Main, J., Tan, L., Cox, M., McGee, E., & **Katz**, **A.** (2020). The correlation between undergraduate student diversity and the representation of women of color faculty in engineering. *Journal of Engineering Education*, *109*(4), 843–864.

Book Chapters

B1 **Katz**, **A.**, Godwin, A., & Brozina, C. (2023). Advanced considerations in quantitative methods for new directions in engineering education research. In A. Johri (Ed.), *International handbook of engineering education research*. Routledge.

Refereed Conference Proceedings

C57 Chaback†, B. E., **Katz**, **A.**, & Gerhardt†, M. (2026). When can AI be used anyway? An analysis of engineering faculty's generative AI policies. *Proceedings of the 133rd Annual Conference of the American Society for Engineering Education.*

C56 Clements, H. R., Gerhardt†, M., Sun, Y. S., Budhathoki, R., Borrego, M., Deters, J. R., **Katz**, **A.**, & Knight, D. B. (2026). Understanding the master's engineering workforce landscape: Employer demands and student goals. *Proceedings of the 133rd Annual Conference of the American Society for Engineering Education.*

C55 Gerhardt†, M., Shiekh†, K., **Katz**, **A.**, & Chaback†, B. E. (2026). It's like "X": How engineering faculty metaphors construct (and constrain) AI understanding in engineering education. *Proceedings of the 133rd Annual Conference of the American Society for Engineering Education.*

C54 **Katz**, **A.**, Paretti, M. C., Shealy, T., Aruon, A., & Li†, N. (2026). ECR-EDU core research: Student mental models of social-ecological-technological systems and their capstone design projects. *Proceedings of the 133rd Annual Conference of the American Society for Engineering Education.*

C53 Mavunga, S., Xu, X., **Katz**, **A.**, & Tan, L. (2026). Work-in-Progress: Statistical mindset in engineering students. *Proceedings of the 133rd Annual Conference of the American Society for Engineering Education.*

C52 Oh, S., **Katz**, **A.**, & McCrickard, S. (2026). Visualizing 30 years of CHI research with generative AI. *Extended Abstracts of the 2026 CHI Conference on Human Factors in Computing Systems*, 1–6.

C51 Tran, H. H., **Katz**, **A.**, Berger, E. J., & Cuervo-Basurto, A. (2026). Toward mastery learning: A conceptual framework for AI-supported feedback in undergraduate engineering. *Proceedings of the 133rd Annual Conference of the American Society for Engineering Education.*

C50 Gerhardt†, M., & **Katz**, **A.** (2025). Automated analysis of knowledge types in computer science textbooks: A natural language processing approach to understanding epistemic climate. *Proceedings of the 132nd Annual Conference of the American Society for Engineering Education.*

C49 Alsharif†, A., Denton, M., Knight, D., Borrego, M., & **Katz**, **A.** (2024). Skill development of engineering and physical science doctoral students: Understanding the role of advisor, faculty, and peer interactions. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C48 Alsharif†, A., & **Katz**, **A.** (2024). From manual coding to machine understanding: Students' feedback analysis. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C47 Anakok†, I., Chew, K., Matusovich, H., & **Katz**, **A.** (2024). Paradigm shift? Preliminary findings of engineering faculty members' mental models of assessment in the era of generative AI. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C46 Anakok†, I., Hess, J. L., Panuganti, S., Jesiek, B. K., & **Katz**, **A.** (2024). Board 277: Exploring the intersection of diversity, equity, inclusion, and ethics in engineering: Project overview and preliminary results. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C45 Bilow, F., Paretti, M., Shealy, T., & **Katz**, **A.** (2024). Novel approach designing interview protocols with generative large language models to study mental models and engineering design. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C44 Hess, J. L., Panuganti, S., Anakok†, I., Jesiek, B., & **Katz**, **A.** (2024). Perspectives from academics and practitioners on the integration of DEI in engineering codes of ethics. *2024 IEEE Frontiers in Education Conference (FIE)*, 1–9.

C43 **Katz**, **A.**, Paretti, M. C., Shealy, T., & Bilow, F. (2024). Board 236: Design for sustainability: How mental models of social-ecological systems shape engineering design decisions. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C42 Oh, S., Cao, Y., **Katz**, **A.**, & Zhao, J. (2024). Explore public's perspectives on generative AI in computer science (CS) education: A social media data analysis. *2024 IEEE Frontiers in Education Conference (FIE)*, 1–9.

C41 Ross†, A., **Katz**, **A.**, Chew, K., & Matusovich, H. (2024). Stumbling our way through finding a better prompt: Using GPT-4 to analyze engineering faculty's mental models of assessment. *Proceedings of the 131st Annual Conference of the American Society for Engineering Education.*

C40 Wahed, S., & **Katz**, **A.** (2024). Where political affiliation and sustainability meet: A study of undergraduate engineering students' career choices. *Proceedings of the ASEE South East Section Meeting.*

C39 Anakok†, I., Hess, J., Panuganti, S., & **Katz**, **A.** (2023). Exploring faculty members' conceptualizations of diversity, equity, and inclusion in engineering education. *IEEE Frontiers in Education Conference (FIE).*

C38 Anakok†, I., Huerta, M., & **Katz**, **A.** (2023). Exploring the impact of engineering projects in community service on engineering students' perspectives about engineering as a major. *IEEE Frontiers in Education Conference (FIE).*

C37 Hess, J., **Katz**, **A.**, Anakok†, I., Jesiek, B., Whitehead, A., & Panuganti, S. (2023). Promoting research quality to study mental models of ethics and diversity, equity, and inclusion (DEI) in engineering. *Proceedings of the 130th Annual Conference of the American Society for Engineering Education.*

C36 Hingle, A., **Katz**, **A.**, & Johri, A. (2023). Exploring NLP-based methods for generating engineering ethics assessment qualitative codebooks. *IEEE Frontiers in Education Conference (FIE).*

C35 Johnson, B., Main, J., & **Katz**, **A.** (2023). How participating in extracurricular activities supports dimensions of student wellness. *IEEE Frontiers in Education Conference (FIE).*

C34 Norris, M., Taimoory, H., **Katz**, **A.**, & Grohs, J. R. (2023). Board 65: Work-in-Progress: Using natural language processing to facilitate scoring of scenario-based assessments. *Proceedings of the 130th Annual Conference of the American Society for Engineering Education.*

C33 Ross†, A., **Katz**, **A.**, Matusovich, H., & Chew, K. (2023). WIP: Faculty use of metaphors when discussing assessment. *Proceedings of the 130th Annual Conference of the American Society for Engineering Education.*

C32 Shakir†, U., Hess, J., James, M., & **Katz**, **A.** (2023). Pushing ethics assessment forward in engineering: NLP-assisted qualitative coding of student responses. *Proceedings of the 130th Annual Conference of the American Society for Engineering Education.*

C31 Alsharif†, A., **Katz**, **A.**, Knight, D., & Alatwah, S. (2022). Using sentiment analysis to evaluate first-year engineering students teamwork textual feedback. *2022 ASEE Annual Conference & Exposition.*

C30 Anakok†, I., Woods, J., Huerta, M., Schoepf, J., Murzi, H., & **Katz**, **A.** (2022). Students' feedback about their experiences in EPICS using natural language processing. *2022 IEEE Frontiers in Education Conference (FIE)*, 1–9.

C29 Chew, K., Ross†, A., **Katz**, **A.**, & Matusovich, H. M. (2022). Defining assessment: Foundation knowledge toward exploring engineering faculty's assessment mental models. *2022 IEEE Frontiers in Education Conference (FIE)*, 1–8.

C28 **Katz**, **A.**, Brozina, C., Johri, A., & Shuman, L. (2022). Analysis of Advances in Engineering Education publications (2007-2020) to examine impact and coverage of topics. *2022 IEEE Frontiers in Education Conference (FIE)*, 1–9.

C27 Maltese, A., Paul, K., Kim, J., Godwin, A., **Katz**, **A.**, & Diekman, A. (2022). Collateral damage: Investigating the impacts of COVID on STEM professionals with caregiving responsibilities. *2022 ASEE Annual Conference & Exposition*.

C26 Menon, M., **Katz**, **A.**, & Paretti, M. (2022). A thematic and trend analysis of engineering education for sustainable development. *2022 ASEE Annual Conference & Exposition*.

C25 Murzi, H., Fielding, L., Huerta, M., Alvarez, J. O., James, M., **Katz**, **A.**, & Grohs, J. (2022). Understanding first-year engineering students' perceptions of working with real stakeholders on a design project: A PBL approach. *2022 IEEE Frontiers in Education Conference (FIE)*, 1–6.

C24 Nanda, G., Wei, S., Ohland, M., **Katz**, **A.**, & Brinton, C. (2022). Work-in-Progress: Using Latent Dirichlet Allocation to uncover themes in student comments from peer evaluations of teamwork. *2022 ASEE Annual Conference & Exposition*.

C23 Schibelius, L., Ross†, A., & **Katz**, **A.** (2022). An empirical study of programming languages specified in engineering job postings. *2022 ASEE Annual Conference & Exposition*.

C22 Shakir†, U., Ovink, S., & **Katz**, **A.** (2022). Using natural language processing to explore undergraduate students' perspectives of social class, gender, and race. *2022 ASEE Annual Conference & Exposition*.

C21 Yan, S., Kang, E., **Katz**, **A.**, & Hira, A. (2022). Augmented reality for sustainable collaborative design. *2022 ASEE Annual Conference & Exposition*.

C20 Yuan, C., Rossi, R. A., **Katz**, **A.**, & Eldardiry, H. (2022). Clustering-based unsupervised generative relation extraction. *2022 IEEE International Conference on Big Data (Big Data)*, 812–817.

C19 Abdelhamid, S., & **Katz**, **A.** (2021a). Factors associated with collaboration networks in ASEE conference papers. *American Society for Engineering Education Annual Conference*.

C18 Abdelhamid, S., & **Katz**, **A.** (2021b). Figurative language in computer education: Evidence from YouTube instructional videos. *American Society for Engineering Education Annual Conference*.

C17 **Katz**, **A.**, Norris, M., Alsharif†, A., Klopfer, M., Knight, D., & Grohs, J. (2021). Using natural language processing to facilitate student feedback analysis. *American Society for Engineering Education Annual Conference*.

C16 **Katz**, **A.**, Shakir†, U., Anakok†, I., & Murzi, H. (2021). Engineering ethics in engineering design courses: A preliminary investigation. *American Society for Engineering Education Annual Conference*.

C15 Ketchum, Q., Paretti, M. C., Murzi, H., & **Katz**, **A.** (2021). Your views can be my views: Understanding differences in paradigms held by traditionally marginalized students in engineering. *American Society for Engineering Education Annual Conference*.

C14 Abdelhamid, S., & **Katz**, **A.** (2020a). Harvesting tweets for a better understanding of engineering students' first-year experiences. *2020 First-Year Engineering Experience Conference*.

C13 Abdelhamid, S., & **Katz**, **A.** (2020b). Using chatbots as smart teaching assistants for first-year engineering students. *2020 First-Year Engineering Experience Conference*.

C12 Fore, G. A., Hess, J. L., & **Katz**, **A.** (2020). Ethics in engineering or engineering in ethics? *Proceedings of the 127th Annual Conference of the American Society for Engineering Education*.

C11 **Katz**, **A.**, & Shakir†, U. (2020). An investigation of when and where ethics appears in undergraduate engineering curricula. *2020 ASEE Virtual Annual Conference*.

C10 **Katz**, **A.**, Shealy, T., & Godwin, A. (2020). Civil engineering students' beliefs about the technical and social implications of global warming and when global warming will impact them personally and others. *2020 ASEE Virtual Annual Conference*.

C9 Salado, A., & **Katz**, **A.** (2019). Monetizing life may be the ethical thing to do [Runner-Up Best Paper in ISE Division]. *2019 American Society for Engineering Education Annual Conference*.

C8 **Katz**, **A.**, & Riley, D. (2018). Learning from failures: Engineering education in an age of academic capitalism. *American Society for Engineering Education Annual Conference*.

C7 Nittala, S., Zephirin, T., Howland, S. M. J., Kim, D., **Katz**, **A.**, & Jesiek, B. K. (2018). Investigating influences on first-year engineering students' views of ethics and social responsibility. *American Society for Engineering Education Annual Conference*.

C6 Davis, M., Herkert, J., Loui, M., Nair, I., Pfatteicher, S., Pritchard, M., & **Katz**, **A.** (2017). Telling it like it was: Histories of change in engineering ethics education. *Panel Session at the Association for Practical and Professional Ethics Annual Conference*.

C5 **Katz**, **A.**, & Knight, D. (2017). Factors related to faculty views of undergraduate engineering ethics education. *American Society for Engineering Education Annual Conference*.

C4 **Katz**, **A.** (2016a). Addressing the state of higher education in State of the Union addresses. *Association for the Study of Higher Education Annual Conference*.

C3 **Katz**, **A.** (2016b). The revealing effects of disaster: A case study from Tulane University. *American Society for Engineering Education Annual Conference*.

C2 **Katz**, **A.**, Lambrinidou, Y., & Riley, D. M. (2016). Shadow codes of engineering ethics: An experiment in ethics imaginaries. *Association for Practical and Professional Ethics Annual Conference*.

C1 Riley, D., & **Katz**, **A.** (2015). Educating for a revolution: Discerning together the Highlander idea and its lessons for ESJP's work. *Engineering, Social Justice, and Peace Annual Conference*.

Preprints and Working Papers

P10 Chen, S. E., Cheng, Y., & **Katz**, **A.** (2026). Occupational green potential: A continuous task-based measure of green work. *SSRN Electronic Journal*.

P9 Gonzalez, X., Fleming, G. C., **Katz**, **A.**, Denton, M., & Deters, J. (2026). LLM-assisted sentiment analysis for integrated computational and qualitative mixed methods education research: A case study of students' written reflection assignments. *arXiv preprint arXiv:2605.27403*.

P8 **Katz**, **A.** (2026). Extending minimal pairs with ordinal surprisal curves and entropy across applied domains. *arXiv preprint arXiv:2603.14400*.

P7 Platt, N., Nizamani, S., Tural, A., Tural, E., Nizamani, S., **Katz**, **A.**, Lee, Y., & Basit, N. (2026). Can LLMs reason about attention? Towards zero-shot analysis of multimodal classroom behavior. *arXiv preprint arXiv:2604.03401*.

P6 Anakok†, I., **Katz**, **A.**, Chew, K. J., & Matusovich, H. (2025b). Engineering faculty members' thinking on reshaping assessment in the age of generative artificial intelligence. *SSRN Electronic Journal*.

P5 Gamieldien†, Y., Case, J. M., & **Katz**, **A.** (2023). Advancing qualitative analysis: An exploration of the potential of generative AI and NLP in thematic coding. *Available at SSRN 4487768*.

P4 Gamieldien[†], Y., McCord, R., & **Katz**, **A.** (2023). Utilizing natural language processing to examine self-reflections in self-regulated learning. *Available at SSRN 4487795*.

P3 **Katz**, **A.**, Shakir[†], U., & Chambers, B. (2023). The utility of large language models and generative AI for education research. *arXiv preprint*.

P2 **Katz**, **A.**, Wei, S., Nanda, G., Brinton, C., & Ohland, M. (2023). Exploring the efficacy of ChatGPT in analyzing student teamwork feedback with an existing taxonomy. *arXiv preprint*.

P1 Yuan, C., Rossi, R., **Katz**, **A.**, & Eldardiry, H. (2020). Reinforcement learning-based N-ary cross-sentence relation extraction. *arXiv preprint*.

Manuscripts Under Review

Mapping Social-Ecological-Technological Systems in Student Environmental Ethics Cases: An AI-Assisted Approach.

Decoding Mental Models: A Generative AI Approach to Identifying Causal Beliefs in Systems Thinking.

INVITED TALKS

2026 *Uses of Generative AI in Qualitative Research*
University of Washington, Seattle, WA

2026 *Design Decisions for AI-Assisted Qualitative Data Analysis*
European Society for Engineering Education (SEFI)

2025 *From Natural Language to New Understandings: Developing AI-Powered Methodologies for Engineering Education Research and Practice*
Purdue University, West Lafayette, IN

2025 *Ways to Think About Applying Large Language Models to Support Engineering Education Research*
University of Connecticut, Storrs, CT

2025 *Opportunities for Large Language Models in Engineering Education*
University of Virginia, Charlottesville, VA

2025 *Lessons from Applying Large Language Models in Engineering Education Research*
University of Cincinnati, Cincinnati, OH

2025 *Approaches to Assessment Strategies in Engineering in the Age of Generative AI*
University of São Paulo, São Paulo, Brazil

2025 *Ethical Considerations of AI in Engineering Education*
Pontifícia Universidade Católica do Paraná, Curitiba, Brazil

2025 *Strategies for Adapting to Generative AI in Educational Assessment*
Virginia Tech Center for Engaged Teaching and Learning, Blacksburg, VA

2025 *Artificial Intelligence in Environmental Engineering Education*
Association of Environmental Engineering and Science Professors, Education Committee Webinar, Virtual

2025 *Connecting Learning Objectives to Assessment with Generative AI*
Virginia Tech Technology-enhanced Learning and Online Strategies, Blacksburg, VA

2024 *Using AI in Educational Research*
George Mason University, Fairfax, VA

2023 *Natural Language Processing in Social Science Research*
Indiana University Social Science Research Commons, Bloomington, IN

INVITED PANELS

2024 *Uses of Large Language Models in Qualitative Research*
International Conference on Quantitative Ethnography, Philadelphia, PA

2024 *Natural Language Processing in Education Research*
National Science Foundation Grantees Conference, Arlington, VA

2024 *Innovation with Responsibility: Ethics and the Applied Uses of AI*
Association for Practical and Professional Ethics, Virtual

WORKSHOPS AND SEMINARS

2026 *Innovating Engineering Education with Generative AI, Part II*
Fulbright Brazil, Washington, DC

2025 *Important Concepts in Engineering Education Research Methods*
University of Virginia, Charlottesville, VA

2025 *Innovating Engineering Education with Generative AI*
Fulbright Brazil, São Paulo, Brazil

2025 *Leveraging Generative AI to Optimize Research, Teaching, and Learning*
American Society for Engineering Education, Virtual

2025 *Strategies for Integrating Generative AI in Engineering Education*
Penn State University, University Park, PA

2024 *Using Generative AI in Engineering Education*
ASEE Annual Conference, Portland, OR

2023 *The Use of Generative AI Tools for Engineering Education Research, Teaching, and Learning*
ASEE Annual Conference, Baltimore, MD

2023 *Generative AI in Engineering Education Teaching and Research*
University of Michigan, Ann Arbor, MI

MEDIA APPEARANCES

2026 — *AI in Engineering Education Research*
Engineering Education Research Briefs, Purdue University · Podcast (forthcoming)

2026 — *How Are College Professors Reacting to More AI Usage by Students?*
WSLS 10 News, Roanoke, VA · Television

2025 — *Artificial Intelligence with Dr. Andrew Katz*
DMV Spotlight with Barbara Britt · Radio/Podcast

2024 — *Generative AI to Impact Education*
WDBJ7 *Here @ Home*, Roanoke, VA · Television

2024 — *AI and Education with Andrew Katz*
Curious Conversations, Virginia Tech Office of Research and Innovation · Podcast

2022 — *Ethics in Engineering*
ASME TechCast, American Society of Mechanical Engineers · Podcast

TEACHING

Fall 2019, 2023 — **ENGE 1215** — Foundations of Engineering I

Fall 2019, Spring 2020 — **ENGE 5704** — Engineering Education Graduate Seminar

Spring 2020, 2021 — **ENGE 5714** — Topics: Quantitative Data Analysis

Fall 2021 — **ENGE 5974/6974** — Independent Study: Applications of Natural Language Processing in Engineering Education

Fall 2021, 2024 — **ENGE 5604** — Engineering Education Research Methods

Spring 2022, 2023 — **ENGE 6614** — Quantitative Data Analysis for Engineering Education

Spring 2019 — **ENGE 590** — Environmental Engineering Ethics and Decision Making

GRADUATE ADVISING

Current Doctoral Students

2026– **Lexy Andershock**
Topic: *to be determined*

2026– **James Umphress**
Topic: *to be determined*

2025– **Nathan Li**
Topic: *sustainability, design, and mental models*

2024– **Emad Ali**
Topic: *AI and assessment*

2024– **Benjamin Chaback**
Topic: *AI for teaching and learning; technology adoption*
Co-advised with Jacob Grohs

2024– **Kylee Shiekh**
Topic: *computer science student competency and professional development*

2023– **Mitchell Gerhardt**
Topic: *AI and expertise development*

Completed Doctoral Students

2025 **Isil Anakok, Ph.D.**
Initial placement: Assistant Professor, University of Jamestown
Dissertation: *An Exploration of Generative Artificial Intelligence in Engineering Education and Research*

2025 **Amanda Ross, Ph.D.**
Initial placement: Assistant Professor, Rose-Hulman Institute of Technology
Dissertation: *A Holistic Approach to Building Resilient Computer Science Pathways: Exploring Gender, Engagement, and Attrition in Computer Science from Academia to Industry*

2025 **Abdulrahman Alsharif, Ph.D.**
Initial placement: Saudi Arabia Government Ministry
Dissertation: *Exploring Engineering Employment Trends: A Decade-Long Deep Dive into Skills and Competencies Included in Job Advertisements*

2023 **Yasir Gamieldien, Ph.D.**
Initial placement: Harvard Strategic Data Project Fellow
Dissertation: *Innovating the Study of Self-Regulated Learning: An Exploration through NLP, Generative AI, and LLMs*

2023 **Umair Shakir, Ph.D.**
Initial placement: Assistant Professor of Civil Engineering, University of Mount Union
Dissertation: *A Novel Method for Thematically Analyzing Student Responses to Open-Ended Case Scenarios*

2023 **Tina Griesinger, Ph.D.**
Dissertation: *An Exploration of Students' Interests in Pursuing Careers in Environmental Sustainability*

SERVICE

Institutional

2025– **Member**, College of Engineering Advisory Committee on AI, Virginia Tech

2025– **Member**, Technology-enhanced Learning and Online Strategies AI^2 Working Group, Virginia Tech

2024– **Chair**, Department Graduate Committee, Virginia Tech

2023–2024 **Member**, Department Undergraduate Committee, Virginia Tech

2021–2023 **Department Representative**, College of Engineering Faculty Organization, Virginia Tech

2019–2020 **Member**, Department Graduate Committee, Virginia Tech

Professional

2020–2022 **Member**, Executive Board Nominating Committee, Association for Practical & Professional Ethics

2019–2021 **Secretary**, Engineering and Public Policy Division, American Society for Engineering Education

Peer Review

Journal of Engineering Education · Computers & Education · IEEE Transactions on Education · International Journal of Qualitative Methods · National Science Foundation