

## YOAV BERGNER

370 Jay Street ◊ Room 526 ◊ New York, NY 11201

(646) 997 0744 ◊ yoav.bergner@nyu.edu

### EDUCATION

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Massachusetts Institute of Technology

Ph.D., Theoretical Physics

September 2003

Harvard University

B.A., Physics, *magna cum laude*

June 1997

### ACADEMIC APPOINTMENTS

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NYU Steinhardt, Department of Administration, Leadership and Technology  
and Dept. of Applied Statistics, Social Sciences and Humanities

Assistant Professor of Learning Sciences & Educational Technology

September 2016–

Massachusetts Institute of Technology, RELATE group  
(Research on Learning, Assessing and Tutoring Effectively)

Postdoctoral Research Associate

July 2011–July 2013

### OTHER PROFESSIONAL EXPERIENCE

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Research Scientist, Educational Testing Service  
Computational Psychometrics Research Center

July 2013–July 2016

Adjunct Professor, New York University  
Steinhardt School of Culture, Education, and Human Development

2015–2016

Assistant Professor of Physics, Bard High School Early College Queens  
and Teacher, NYC Department of Education

2008–2011

President and Founder, gammafive studios, inc.

2003–2008

Studio furniture, artwork fabrication, and architectural installations in wood, metal, and new media.

### JOURNAL ARTICLES

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1. Chen, O.\* & **Bergner, Y.**, (*in press*) “I know it when I see it”: Employing reflective practice for assessment and feedback of reflective writing in a makerspace classroom. *Information and Learning Sciences*.
2. Zhang, S., **Bergner, Y.**, Tripani, J.\*, & Jeon, M. (*in press*) Modeling the interaction between resilience and ability in assessments with allowances for multiple attempts. *Journal of Computers and Human Behavior*.
3. McAlpin, E., **Bergner, Y.**, & Levine, M. (2020) Summative Assessments of Web-Based Patient Simulations of Preclinical Local Anesthesia and Non-Surgical Extraction. *European Journal of Dental Education*.
4. **Bergner, Y.**, Mund, S.\*, Chen, O.\*, & Payne, W.\* (2020). Leveraging interest-driven embodied practices to build quantitative literacies: A case study using motion and audio capture from dance. *Educational Technology Research and Development*, 1-24.

5. Mohan, K.\*, **Bergner, Y.**, & Halpin, P. (2020) Predicting group performance using process data in a collaborative assessment. *Technology, Knowledge and Learning*, 25(2), 367-388.
6. **Bergner, Y.**, Choi, I., & Castellano, K. (2019). Item response models for multiple attempts with incomplete data. *Journal of Educational Measurement*, 56: 415-436. doi:10.1111/jedm.12214
7. **Bergner, Y.**, Gray, G., & Lang, C. (2018). What does methodology mean for learning analytics? (Editorial) *Journal of Learning Analytics* 5(2), 1-8.
8. Halpin, P. F. & **Bergner, Y.** (2018). Psychometric models of small group collaboration. *Psychometrika*. <https://dx.doi.org/10.1007/s11336-018-9631-z>
9. **Bergner, Y.** & von Davier, A. A. (2018). Process data in NAEP: Past, present, and future. *Journal of Educational and Behavioral Statistics*. 44(6), 706-732.
10. Shu, Z. **Bergner, Y.**, Zhu, M., Hao, J., & von Davier, A. A. (2017). An item response theory analysis of problem-solving processes in scenario-based tasks. *Psychological Test and Assessment Modeling* 59(1), 109-131.
11. Seaton, D., **Bergner, Y.**, Chuang, I., Mitros, P., and Pritchard, D. (2014), Who does what in a massive open online course. *Communications, ACM* Volume 57, April 2014, pp 58-65
12. Kortemeyer, G., Seaton, D., **Bergner, Y.**, Rayyan, S., and Pritchard, D. (2014). Analyzing the impact of course structure on electronic textbook use in blended introductory physics courses, *American Journal of Physics* Volume 82, 1186
13. **Bergner, Y.**, and Bettencourt, L.M.A. (2004). The self-consistent bounce: an improved nucleation rate, *Phys Rev D* 69 045012.
14. **Bergner, Y.**, and Bettencourt, L.M.A. (2004). Dressing up the kink, *Phys Rev D* 69 045002.
15. **Bergner, Y.**, and Bettencourt, L.M.A. (2003). A step beyond the bounce: bubble dynamics in quantum phase transitions, *Phys Rev D* 68 025014.
16. **Bergner, Y.**, and Jackiw, R. (2001). Integrable Supersymmetric Fluid Mechanics from Superstrings, *Phys Lett A* 284 146.

## UNDER REVIEW

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1. **Bergner, Y.** & Chen, O.\*, (*under review*) Teachers' Ontology-based Reasoning for Assessment in Student-centered Learning Environments.
2. **Bergner, Y.**, Halpin, P., & Vie, J. (*under review*) Exploratory multidimensional item response theory in the style of collaborative filtering.

## PEER-REVIEWED CONFERENCE PROCEEDINGS

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1. Payne, W.\*, **Bergner, Y.**, West, M., Charp, C., Shapiro, R., Szafr, D., Taylor, E., & DesPortes, K. (2021). danceON: Culturally Responsive Creative Computing for Data Literacy. In *Proceedings of (CHI 2021)* **Honourable Mention**
2. **Bergner, Y.**, Damast, D., Romita, A., & Smock, A. M. R. (2020). Movement Computing Education for Middle Grades. In *Proceedings of the 7th International Conference on Movement and Computing (MOCO 2020)* (pp. 1-5).
3. **Bergner, Y.**, Mund, S.\*, Chen, O.\*, & Payne, W.\* (2019) First steps in dance data science: Educational Design. *6th International Conference on Movement and Computation (MOCO 2019)*. Tempe, AZ.

4. Ahmed, I.\*, Mawasi, A., Wang, S., Wylie, R., **Bergner, Y.**, Whitehurst, A., & Walker, E. (2019). Investigating Help-Giving Behavior in a Cross-Platform Learning Environment. *AIED 2019*. Chicago, IL.
5. **Bergner, Y.**, Abramovich, S., Worsley, M., & Chen, O.\* (2019) What are the learning objectives in educational Makerspaces and Fablabs? *Fablearn 2019*. New York, NY.
6. **Bergner, Y.** & Chen, O.\* (2018) Deep Making: Curricular Modules for Transferable Content-Knowledge and Scientific Literacy in Makerspaces and FabLabs. *IDC 2018*. Trondheim, Norway.
7. Zhu, M., **Bergner, Y.**, Wang, Y., Baker, R., Barnes, T., and McNamara, D. S. (2016). Exponential Random Graph Models for Studying Interactions Between Engagement, Performance and Social Connectivity, *6th International Learning Analytics and Knowledge Conference (LAK 2016)*. Edinburgh, UK.
8. **Bergner, Y.**, Kerr, D., and Pritchard, D. (2015) Methodological Challenges in the Analysis of MOOC Data for Exploring the Relationship between Discussion Forum Views and Learning Outcomes, *Proceedings of the 7th Annual Conference on Educational Data Mining (EDM2015)*, Madrid, Spain.
9. Crossley, S., McNamara, D. S., Baker, R., Wang, Y., Paquette, L., Barnes, T., and **Bergner, Y.** (2015). Language to Completion: Success in an Educational Data Mining Massive Open Online Class, *Proceedings of the 7th Annual Conference on Educational Data Mining (EDM2015)*, Madrid, Spain.
10. **Bergner, Y.**, Colvin, K., and Pritchard, D. (2015). Estimation of Ability from Homework Items When There Are Missing and/or Multiple Attempts, *Proceedings of the 5th International Learning Analytics and Knowledge Conference (LAK 2015)*. Poughkeepsie, NY.
11. **Bergner, Y.**, Shu, Z., and von Davier, A. (2014), Visualization and Confirmatory Clustering of Sequence Data from a Simulation-Based Task, In *Proceedings of the 7th Annual International Conference on Educational Data Mining (EDM 2014)*. **Nominated for best paper award.**
12. Pardos, Z., **Bergner, Y.**, Seaton, D., and Pritchard, D. (2013). Adapting Bayesian knowledge tracing to massive open online courses, In *Proceedings of the 6th Annual International Conference on Educational Data Mining (EDM2013)* **Nominated for best paper award.**
13. Seaton, D., **Bergner, Y.**, Kortemeyer, G., Rayyan, S., Chuang, I., and Pritchard, D. (2013), The Impact of Course Structure on eText Use in Large-Lecture Introductory-Physics Courses, *Proceedings of the 2013 Physics Education Research Conference*. Portland, OR.
14. Seaton, D., **Bergner, Y.**, and Pritchard, D. (2013). Exploring the relationship between course structure and etext usage in blended and open online courses, In *Proceedings of the 6th Annual International Conference on Educational Data Mining (EDM2013)*.
15. **Bergner, Y.**, Rayyan, S., Seaton, and Pritchard, D. (2012). Multidimensional student skills from collaborative filtering, *Proceedings of the 2012 Physics Education Research Conference*.
16. **Bergner, Y.**, Droschler, S., Rayyan, S., Seaton, D., Kortemeyer, G., and Pritchard, D. (2012). Model-based collaborative filtering analysis of student response data: machine-learning item response theory, In Yacef, K., Zaiane, O., Hershkovitz, H., Yudelson, M., and Stamper, J. (Eds.), *Proceedings of the 5th International Conference on Educational Data Mining (EDM 2012)*.

## RESEARCH AND TECHNICAL REPORTS

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1. **Bergner, Y.** & Fayard, A. L. (2021). Assessing Collaborative Processes via Instrumented Working Spaces. In Rapid Community Report Series.

2. Wise, A. F. & **Bergner, Y.** (2020) College in the Time of Corona: Spring 2020 Student Survey. New York, NY: NYU-LEARN.
3. **Bergner, Y.** (2018). *CPSX: A tool for collaborative problem-solving in Open edX* (Research Memorandum No. RM-18-03). Princeton, NJ: Educational Testing Service.
4. **Bergner, Y.**, Andrews, J. J., Zhu, M., & Gonzales, J. E. (2016). Agent-based modeling of collaborative problem solving (Research Report No. RR-16-27). Princeton, NJ: Educational Testing Service.

## BOOK CHAPTERS

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1. **Bergner, Y.** (2017). Measurement and its Uses in Learning Analytics. In Lang, C., Gasevic, D., Wise, A., & Siemens, G.(Eds.) *Handbook of Learning Analytics and Educational Data Mining*
2. **Bergner, Y.**, Walker, E., and Ogan, A. (2017). Dynamic Bayesian Network Models for Peer Tutor Interactions, In von Davier, A., Zhu, M., & Kyllonen, P. (Eds.) *Innovative Assessments of Collaboration*, Springer.
3. Zhu, M. & **Bergner, Y.**, (2017). Network Models for Teams with Overlapping Membership, In von Davier, A., Zhu, M., & Kyllonen, P. (Eds.) *Innovative Assessments of Collaboration*, Springer.

## CONFERENCE WORKSHOP AND POSTER PROCEEDINGS

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1. Daniels, C. \*, **Bergner, Y.**, Lynch, C., and Barnes, T. (2018). Testing temporal hypotheses about online Q&A behavior: a statistical model and meta-analysis' In *Proceedings of the 8th International Learning Analytics and Knowledge Conference* (LAK 2018). Sydney, Australia.
2. **Bergner, Y.**, Lang, C., & Gray, G. (2017). A Focus on Methodology in Learning Analytics: Building a Structurally Sound Bridge Discipline (Editorial). *CEUR Workshop Proceedings, 1915*.
3. Brown, R., Lynch, C. F., Wang, Y., Eagle, M., Albert, J., Barnes, T., Baker, R., **Bergner, Y.**, & McNamara, D. (2015). Communities of performance & communities of preference. In *Proceedings of the 2nd International Workshop on Graph-Based Educational Data Mining*. Madrid, Spain.
4. **Bergner, Y.**, Walker, E. and Ogan, A. (2014). Classifying Peer Tutee Learning Gains with Hidden Markov Models. (SIGKDD 2014) New York, NY.

## FUNDING

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### Awarded

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|---|-----------|
| 1. NSF STEM+C: Dancing Across Boundaries of Computing Education<br>(co-PI, PI: K. DesPorts \$1,200,000)                                       | 2019–2021 |
| 2. Steinhardt Cross-Department Collaboration Grant (NYU Internal) (PI, \$10,000)  | 2019-2020 |
| 3. CIRCL Working Group on Instrumented Learning Spaces (PI, \$70,000)   | 2018–2019 |
| 4. PIE Challenge Research Partnership (PI, \$28,000)  | 2018–2020 |
| 5. Global Research Initiative (NYU Internal) (PI, \$4,500)  | 2018      |
| 6. Moore-Sloane Data Science Environment (NYU Internal)<br>Bringing Real-Time Collaboration into Online Education (PI, \$25,000)              | 2017–2018 |
| 7. MacArthur/ETS Edmund W. Gordon Fellowship for 21st Century Learning and Assessment<br>Assessment of Learning in MakerSpaces (PI, \$45,000) | 2015      |

8. National Science Foundation 2014-2018  
Collaborative Research: Modeling Social Interaction and Performance in STEM Learning  
(PI, \$362,857, total award, \$774,447)
9. Hyde and Watson Foundation  
Digital Fabrication in the Science Lab (PI, \$18,500) 2010

## Pending

1. AERA Conference Proposal: Equity First: Decolonizing Data in Education through Critical Learning Analytics (co-PI, \$35,000)

## Declined

1. IES Goal 5: Curriculum Based Assessments of Student Collaboration 2019  
(Role: co-PI; PI: Halpin, \$1,400,000)
2. NSF Cyberlearning: Expert Systems for Real-time Assessment in Project-based Classrooms 2019  
(PI, \$600,000)
3. W. T. Grant Foundation: Intergroup Ties and Social-Emotional Learning. 2019  
(Role: co-Investigator; PI: Cappella, NYU Steinhardt, \$600,000)
4. NSF DRK-12: Achieving Wider Scientific Literacy Through Making Activities 2019  
(PI, \$450,000)
5. National Science Foundation 2017  
AISL: Collaborative Research: Makerspace Identification of Evidence for Learning (PI, \$180,000)
6. Naomi Foundation 2017  
Beam Center/NYU FabLab Evaluation Framework Project (Role: co-PI; PI: B. Cohen, \$25,000)
7. National Science Foundation 2016  
EAGER: Makerspace Identification of Evidence for Learning (PI, \$295,417)
8. National Science Foundation 2015  
STEM+C: The Social Journey of Zoombinis: A socio-cognitive study of CT learning (Role: co-PI; PI: J. Asbell-Clarke, \$599,761)
9. National Science Foundation 2014  
Collaborative Assessments in Mathematics (PI, \$494,891)
10. National Science Foundation 2014  
Quadrature Kalman filtering for tracking change and learning in longitudinal educational assessment data (Role: Co-PI; PI: P. van Rijn, \$219,465)

## FELLOWSHIPS AND AWARDS

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| Edmund W. Gordon MacArthur/ETS Fellow for 21st Century Learning and Assessment | 2013–2016 |
| National Science Foundation (NSF) Graduate Research Fellow                     | 1998–2001 |
| John Harvard Scholar, Harvard College Scholar                                  | 1993–1997 |

## OPEN-SOURCE CODE PROJECTS

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CFIRT, Collaborative Filtering Item Response Theory (<https://github.com/IEDMS/cfirt>) CPSX, An XBlock for Collaborative Problem Solving with Open edX (<https://github.com/ybergner/cpsx>)

## CONFERENCE AND INVITED PRESENTATIONS

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1. Movers, Shakers, and Makers  
Workshop at MakerEd Convening, October 2019
2. Expert Systems for Real-time Assessment in the Classroom  
Invited Speaker, Israel Symposium on Learning Analytics, March 2019
3. Make Your Move: Blending Dance with Educational Technology  
MakerEd Convening, October 2018
4. Progressive Assessment: Emerging Challenges in Digital Higher Education  
Harvard University VPAL Research, April 2017
5. A Perfect Storm for Progressive Assessment: The Educational Maker Movement  
NCME, April 2017
6. Building a Structurally Sound Bridge Discipline  
LAK Methodology in Learning Analytics Workshop, March 2017
7. Assessment of Learning in Makerspaces and Fablabs: Theory and History  
International Testing Commission Conference, Vancouver, BC, July 2016
8. Analytics for Collaborative Learning and Assessment: in the Wild, in the Lab, and in Between  
Seminar, New York University, March 2016
9. CPSX, a tool for online collaborative problem solving in Open edX  
Learning with MOOCs Workshop II, October 2015
10. Manufacturing as a Liberal Art and the Future of Assessment of Learning in MakerSpaces and FabLabs  
CRESST Conference, August 2015
11. Modeling the Effects of Collaboration on Mathematics Performance  
National Council on Measurement in Education 2015 Annual Meeting (co-presented with P. Halpin)
12. Dynamic Bayesian Network Models for Peer Tutor Interactions  
Teachers College Learning Analytics Seminar, September 2014
13. Sequence Mining a NAEP Scenario-Based Task  
International Meeting of the Psychometric Society, July 2014
14. Dynamic Bayesian Network Models for Peer Tutor Interactions  
National Council on Measurement in Education 2014 Annual Meeting
15. Who does what in a Massive Open Online Course (and so what?)  
Seminar, Educational Testing Service, October 2013
16. Homework Collaboration via Discussion Boards in a Massive Open Online Course  
International Meeting of the Psychometric Society, July 2013
17. Data-mining the comparative assistance value of interactions with a dynamical model when individual performance is observed  
National Council on Measurement in Education 2013 Annual Meeting
18. What every science educator should know about psychometrics.  
HHMI Seminar Series, MIT Biology Department, February 2013
19. (Ab)uses of IRT as a real time probe of ability in online learning environments  
National Institute of Testing and Evaluation, Jerusalem, Israel May 2013

20. Collaborative filtering of student response data in online learning environments: machine-learning (multidimensional, multiple-attempt) item response theory  
NYU PRIISM Center, November 2012
21. (Ab)uses of IRT as a real time probe of ability in online learning environments  
Seminar, Educational Testing Service, September 2012
22. IRT in the style of collaborative filtering  
77th International Meeting of the Psychometric Society, July 2012
23. Lessons from school: a case study in high school physics reform  
AAPT Physics Education Research Conference, Omaha NE, August 2011
24. Bubble Dynamics in Quantum Phase Transitions  
National Nuclear Physics Summer School, Santa Fe, NM, August 2002
25. Fluid Mechanics from Superstrings  
QCD Perspectives On Hot And Dense Matter, Cargese, France, August 2001

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## INVITATIONS TO CLOSED CONVENINGS

A Deep Dive into the State of Measures and Diagnostics for Understanding Learners  
Digital Promise and Kidaptive, Monterey, CA, June 2018

Emerging Challenges in Digital Higher Education  
Harvard University VPAL Research, Cambridge, MA, April 2017

NSF Data Intensive Research to Improve Teaching and Learning—An Ideas Lab to Foster Transformative Approaches. Atlanta, GA, Oct 2013

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## DIRECTED WORKSHOPS, TUTORIALS, AND PANELS

1. 3rd Workshop on Methodology in Learning Analytics (Workshop organizer; LAK 2019, Phoenix AZ)
2. 2nd Workshop on Methodology in Learning Analytics (Workshop organizer; LAK 2018, Sydney, NSW, Australia)
3. EdTech MasterClass “Bottom-up Analysis and Evidence-Centered Design” (Masterclass instructor; New York University, Dec 2017)
4. Demystifying Learning Analytics (Panelist, New York University, November 2017)
5. Workshop on Methodology in Learning Analytics (Workshop organizer; LAK 2017, Vancouver, BC, Canada)
6. Understanding the Role of Learning Analytics in Technology-Enhanced Education (panel moderator, New York University, October 2016)
7. Assessment of Learning in Makerspaces and Fablabs (Fablearn 2016 Workshop, Stanford, CA)
8. Intermediate R Workshop (Tutorial presenter; NERA 2015)
9. Data Mining Minicourse, 3rd ICMC Workshop on Probability and Statistics, Sao Carlos, Brazil, 2015.
10. Student Modeling, Recent Developments & Toolkits Tutorial (Tutorial presenter; EDM 2015)
11. Modeling Applied to Problem Solving (MAPS) Pedagogy for Physics (Workshop co-organizer, AAPT 2012)

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## TEACHING EXPERIENCE

## NYU Steinhardt

Foundations of Cognitive Science for Learning, (Fall 2016, 2017, 2018, 2019, 2020; Spring 2018).  
Carpe Datum: Data Science for Life's Big Questions, (Spring 2020, 2021).  
Statistical Analysis of Networks, (Fall 2017, 2019).  
Educational Data Science Practicum, (Spring 2015, 2016, 2017).

## Previous

Philosophy of Science (Spring 2011) Bard Early College  
Physics with Calculus (2010, 2011), Bard Early College  
Calculus I (2009, 2010), Bard Early College  
Intro to Science and High School Physics (2009, 2010, 2011), Bard High School  
Teaching Assistant, MIT, 2001-2003  
8.01 Physics, 8.052 Quantum Mechanics, 8.333 Statistical Mechanics, MIT Writing Center

## SERVICE

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### Student Advisement

Elizabeth McAlpin (NYU, Ph.D in ECT, Dissertation Committee)	2017–2020
Yu-Lun Chen (NYU, Ph.D in Occupational Therapy, Dissertation Committee)	2019–2021
Ofer Chen (NYU, Ph.D in ECT, Dissertation Chair)	2017–present
Shiri Mund (NYU, Ph.D in ECT, Dissertation Chair)	2018–present
Ishrat Ahmed (U. of Pittsburgh, Ph.D in Computer Science, Dissertation Committee)	2018–present
Yu Wang (NYU, Ph.D in ECT, Dissertation Chair)	2019–present

### Editorial and Advisory Boards

Journal of Educational Data Mining (Editorial Board)	2018 – 2020
Journal of Learning Analytics (Special Section Guest Editor)	2018
Purdue University Forecast Project (External Advisory Board)	2017

### Conference Program Committees

Center for Integrative Research in Computing and Learning Sciences (CIRCLS)	2021
Learning Analytics and Knowledge (LAK)	2018, 2019
ACM Conference on Learning at Scale (L@S)	2016
International Conference on Educational Data Mining (EDM)	2016, 2017
International Educational Data Mining Society, co-chair for Algorithm and Code Sharing	2015–2017
AERA 2015 Division D (AERA)	2015
Graph-based methods in Educational Data Mining (GEDM)	2015, 2017
US Fab Lab Network, National Education Committee	2011–2012

## Reviewer

### Research Grant Review

IES Educational Technology, Panel reviewer	2021
National Science Foundation, Panel reviewer DRK-12, ITEST, FW-HTF	2017, 2019, 2020



## Ad Hoc Review

Computers & Human Behavior — Journal of Learning Analytics — Translation and Interpreting Studies — Educational Evaluation and Policy Analysis — Translation and Interpreting Studies — Technology, Knowledge and Learning (TKNL) — Proceedings of the National Academy of Sciences (PNAS) — Computers & Education — Psychometrika — Physical Review Special Topics — Physics Education Research — IEEE Transactions on Learning Technologies — International Journal of Artificial Intelligence in Education — Educational Assessment — Educational Technology Research & Development (ETRD)

## University and Departmental Committees

NYU Steinhardt Doctoral Affairs Committee	2018–Present
ECT Doctoral Program Coordinator	2017–Present
ALT Task-force on Undergraduate Programs	2017–Present
NYU Learning Analytics Research Network (LEARN), founding core faculty	2016–Present

## Memberships

Society of Learning Analytics Research (SoLAR) (Leader, Methodology in Learning Analytics SIG)  
American Educational Research Association (AERA) (Member)  
National Council on Measurement in Education (NCME) (Member)  
International Technology and Engineering Educators Association (Member)  
International Artificial Intelligence in Education Society (Member)  
Psychometric Society (Member)  
American Association of Physics Teachers (Member)  
STEMTeachersNYC (formerly PhysicsTeachersNYC) (Member)  
New York Academy of Sciences (Member)