Nigel Bosch

Curriculum Vitae
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School of Information Sciences and Department of Educational Psychology
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Education

2017	PhD, Computer Science University of Notre Dame, Notre Dame, IN 46556
2016	MS, Computer Science University of Notre Dame, Notre Dame, IN 46556
2012	BS, Computer Science Abilene Christian University, Abilene, TX 79699

Appointments

2019–present	Assistant Professor, School of Information Sciences (75%) Assistant Professor, Department of Educational Psychology (25%) Faculty Affiliate, National Center for Supercomputing Applications Faculty Affiliate, Illinois Informatics University of Illinois Urbana–Champaign
2020–present	Discovery Partners Institute (DPI) Affiliate
2017–2019	Postdoctoral Researcher, National Center for Supercomputing Applications University of Illinois Urbana–Champaign

Awards

Publication Awards

- LAK 2022 Finalist for Best Short Paper Award (International Conference on Learning Analytics & Knowledge)
- EDM 2020 Finalist for Best Paper Award (International Conference on Educational Data Mining)
- AIED 2018 Best Student Paper Award (International Conference on Artificial Intelligence in Education)
- UMAP 2017 Best Student Paper Award (Conference on User Modeling, Adaptation, and Personalization)
- EDM 2017 Best Student Paper Award (International Conference on Educational Data Mining)
- AIED 2015 Best Paper Award (International Conference on Artificial Intelligence in Education)

- EDM 2015 Best Student Paper Award (International Conference on Educational Data Mining)
- IUI 2015 Finalist for Best Paper Award (International Conference on Intelligent User Interfaces)
- ICSE 2014 ACM Distinguished Paper Award (International Conference on Software Engineering)

Other Awards

- Jeanneret Award for Excellence in the Study of Individual or Group Assessment (Society for Industrial and Organizational Psychology), 2024
- College of Education Distinguished Scholar, 2023
- Outstanding SPIN (Students Pushing INnovation) mentor, summer 2018, academic year 2019–2020
- Outstanding reviewer, IEEE Face & Gesture (FG) conference, 2019
- Teachers Ranked as Excellent (University of Illinois teaching award) – fall 2018, fall 2019, spring 2020, fall 2020, fall 2021, spring 2023, spring 2024

Grants

Grants as Principal Investigator (PI)

2020–2024 Collaborative Research: Exploring Algorithmic Fairness and Potential Bias in K-12 Mathematics Adaptive Learning ($987,015; collaborative total: $1,500,000). National Science Foundation (NSF DUE #2000638). PI.

2020–2021 Supporting Self-regulated Learning in Online Education via Automatically Personalized Interventions ($14,997). Technology Innovation in Educational Research and Design (TIER-ED, a University of Illinois initiative). PI.

Grants as Co-PI

2023–2026 Collaborative Research: Examining Elementary Mathematics Teachers' Behaviors and Learning with an Online Professional Development Platform ($1,499,999). National Science Foundation (NSF ECR #2301272). Co-PI.

2022–2025 FairFL-MC: A Metacognitive Calibration Intervention Powered by Fair and Private Machine Learning ($850,000). National Science Foundation (NSF IIS #2202481). Co-PI.

2021–2026 Towards a Wearable Alcohol Biosensor: Examining the Accuracy of BAC Estimates from New-Generation Transdermal Technology using Large-Scale Human Testing and Machine Learning Algorithms ($2,222,481). National Institutes of Health (NIH #R01AA028488). Co-I.

2020–2022 Assessing Eye Movement Scanpaths in Source Code Comprehension ($151,998). Sandia National Laboratories. Co-PI.

2019–2023 Advancing Computational Grounded Theory for Audiovisual Data from STEM Classrooms ($1,313,855). National Science Foundation (NSF DRL #1920796). Co-PI.

2018–2022 Underrepresented Student Learning in Online Introductory STEM College Courses ($1,399,194). Institute of Education Sciences (IES #R305A180211). Co-PI.

Other Grants

2018–2019 National Study of Learning Mindsets Early Career Fellowship ($8000 + travel). Mindset Scholars Network and University of Texas at Austin Population Research Center.

2016 National Science Foundation Travel Award ($1449). 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP).

2015 National Science Foundation Travel Award ($2398). 17th ACM International Conference on Multimodal Interaction (ICMI).

2015 National Science Foundation Travel Award ($1250). 20th ACM Conference on Intelligent User Interfaces (IUI 2015).

2015 National Science Foundation Travel Award ($1000). 8th International Conference on Educational Data Mining (EDM 2015) and 17th International Conference on Artificial Intelligence in Education (AIED 2015).

2015 University of Notre Dame Professional Development and Graduate Student Union Conference Presentation Grant ($2600). 8th International Conference on Educational Data Mining (EDM 2015) and 17th International Conference on Artificial Intelligence in Education (AIED 2015).

2013 National Science Foundation Travel Award ($1300). Doctoral Consortium at 16th International Conference on Artificial Intelligence in Education (AIED 2013).

Publications

Peer-reviewed Journal Publications

Lee, H. & **Bosch, N.** (in press). Subtopic-specific heterogeneity in computer-based learning behaviors. *International Journal of STEM Education*.

Valdiviejas, H., Azevedo, R. F. L., **Bosch, N.**, & Perry, M. (in press). Automatic detection of metacognitive language and student achievement in an online STEM college course. *Online Learning*.

Zhang, Y., Paquette, L., & **Bosch, N.** (in press). Conditional and marginal strengths of affect transitions during computer-based learning. *International Journal of Artificial Intelligence in Education*.

Hickman, L., Saef, R., Ng, V., Woo, S. E., Tay, L., & **Bosch, N.** (2024). Developing and evaluating language-based machine learning algorithms for inferring applicant personality in video interviews. *Human Resource Management Journal, 34*(2), 255-274. DOI: 10.1111/1748-8583.12356

Jeng, A., **Bosch, N.**, & Perry, M. (2024). Phatic expressions influence perceived helpfulness in online peer help-giving: A mixed methods study. *Learning and Instruction, 91*, 101893:1-11. DOI: 10.1016/j.learninstruc.2024.101893

Lawrence, L., Mercier, E., Tucker Parks, T., **Bosch, N.**, & Paquette, L. (2024). Accuracy and effectiveness of an orchestration tool on instructors' interventions and groups' collaboration. *Computers and Education Open, 7*, 14 pages. DOI: 10.1016/j.caeo.2024.100203

Loui, M. C., **Bosch, N.**, Chan, A. S., Davis, J. L., Gutiérrez, R., He, J., Karahalios, K., Koyejo, S., Mendenhall, R., Sanfilippo, M. R., Tong, H., Varshney, L. R., & Wang, Y. (2024). Artificial intelligence, social responsibility, and the roles of the university. *Communications of the ACM, 67*(8), 22-25. DOI: 10.1145/3640541

Stinar, F., Xiong, Z., & **Bosch, N.** (2024). An approach to improve k-anonymization practices in educational data mining. *Journal of Educational Data Mining, 16*(1), 61-83. DOI: 10.5281/zenodo.11056083

Zhang, Y., Paquette, L., & **Bosch, N.** (2024). Using permutation tests to identify statistically sound and nonredundant sequential patterns in educational event sequences. *Journal of Educational and Behavioral Statistics*, 33 pages. DOI: 10.3102/10769986241248772

Ariss, T., Fairbairn, C. E., & **Bosch, N.** (2023). Examining new-generation transdermal alcohol biosensor performance across laboratory and field contexts. *Alcoholism: Clinical & Experimental Research, 47*(1), 50-59. DOI: 10.1111/acer.14977

Baker, R. S., Hutt, S., **Bosch, N.**, Ocumpaugh, J., Biswas, G., Paquette, L., Andres, J. M. A., Nasiar, N., & Munshi, A. (2023). Detector-driven classroom interviewing: Focusing qualitative researcher time by selecting cases in situ. *Educational Technology Research and Development*, 23 pages. DOI: 10.1007/s11423-023-10324-y

Belitz, C., Ocumpaugh, J., Ritter, S., Baker, R. S., Fancsali, S. E., & **Bosch, N.** (2023). Constructing categories: Moving beyond protected classes in algorithmic fairness. *Journal of the Association for Information Science and Technology, 74*(6), 663-668. DOI: 10.1002/asi.24643

Booth, B. M., **Bosch, N.**, & D'Mello, S. K. (2023). Engagement detection and its applications in learning: A tutorial & selective review. *Proceedings of the IEEE, 111*(10), 1398-1422. DOI: 10.1109/JPROC.2023.3309560

Jeng, A., Williams-Dobosz, D., **Bosch, N.**, & Perry, M. (2023). Direct and indirect ways of being helpful in online peer help-giving interactions. *Computers & Education, 205*, 104894:1-15. DOI: 10.1016/j.compedu.2023.104894

Jeng, A., **Bosch, N.**, & Perry, M. (2023). Sense of belonging predicts perceived helpfulness in online peer help-giving interactions. *The Internet and Higher Education, 57*, 100901:1-14. DOI: 10.1016/j.iheduc.2022.100901

Zhang, Y., Paquette, L., Baker, R. S., **Bosch, N.**, Ocumpaugh, J., & Biswas, G. (2023). How are feelings of difficulty and familiarity linked to learning behaviors and gains in a complex science learning task? *European Journal of Psychology of Education, 38*, 777-800. DOI: 10.1007/s10212-022-00616-x

Bosch, N. & D'Mello, S. K. (2022). Can computers outperform humans in detecting user zone-outs? Implications for intelligent interfaces. *ACM Transactions on Computer-Human Interaction (TOCHI), 29*(2), 1-33. DOI: 10.1145/3481889

Hickman, L., **Bosch, N.**, Ng, V., Saef, R., Tay, L., & Woo, S. E. (2022). Automated video interview personality assessments: Reliability, validity, and generalizability investigations. *Journal of Applied Psychology, 107*(8), 1323-1351. DOI: 10.1037/apl0000695

Zhang, Y., Paquette, L., **Bosch, N.**, Ocumpaugh, J., Biswas, G., Hutt, S., & Baker, R. S. (2022). The evolution of metacognitive strategy use in an open-ended learning environment: Do prior domain

knowledge and motivation play a role? *Contemporary Educational Psychology, 69*, 102064:1-14. DOI: 10.1016/j.cedpsych.2022.102064

Bosch, N. & Paquette, L. (2021). What's next? Sequence length and impossible loops in state transition measurement. *Journal of Educational Data Mining, 13*(1), 1-23. DOI: 10.5281/zenodo.5048423

Bosch, N. (2021). Identifying supportive student factors for mindset interventions: A two-model machine learning approach. *Computers & Education, 167*, 104190:1-15. DOI: 10.1016/j.compedu.2021.104190

Bosch, N. (2021). AutoML feature engineering for student modeling yields high accuracy, but limited interpretability. *Journal of Educational Data Mining, 13*(2), 55-79. DOI: 10.5281/zenodo.5275314

Bosch, N. & D'Mello, S. K. (2021). Automatic detection of mind wandering from video in the lab and in the classroom. *IEEE Transactions on Affective Computing, 12*(4), 974-988. DOI: 10.1109/TAFFC.2019.2908837

Fairbairn, C. E. & **Bosch, N.** (2021). A new generation of transdermal alcohol biosensing technology: Practical applications, machine learning analytics, and questions for future research. *Addiction, 116*(10), 2912-2920. DOI: 10.1111/add.15523

Gurrieri, L., Fairbairn, C. E., Sayette, M. A., & **Bosch, N.** (2021). Alcohol narrows physical distance between strangers. *Proceedings of the National Academy of Sciences, 118*(20), e2101937118:1-3. DOI: 10.1073/pnas.2101937118

Williams-Dobosz, D., Jeng, A., Azevedo, R. F. L., **Bosch, N.**, Ray, C., & Perry, M. (2021). Ask for help: Online help-seeking and help-giving as indicators of cognitive and social presence for students underrepresented in chemistry. *Journal of Chemical Education, 98*(12), 3693-3703. DOI: 10.1021/acs.jchemed.1c00839

Zhang, Y., Paquette, L., Baker, R. S., Ocumpaugh, J., **Bosch, N.**, Biswas, G., & Munshi, A. (2021). Can strategic behavior facilitate confusion resolution? The interplay between confusion and metacognitive strategies in Betty's Brain. *Journal of Learning Analytics, 8*(3), 28-44. DOI: 10.18608/jla.2021.7161

Fairbairn, C. E., Kang, D., & **Bosch, N.** (2020). Using machine learning for real-time BAC estimation from a new-generation transdermal biosensor in the laboratory. *Drug and Alcohol Dependence, 216*, 108205:1-108205:8. DOI: 10.1016/j.drugalcdep.2020.108205

Hutt, S., Krasich, K., Mills, C., **Bosch, N.**, White, S., Brockmole, J. R., & D'Mello, S. K. (2019). Automated gaze-based mind wandering detection during computerized learning in classrooms. *User Modeling and User-Adapted Interaction, 29*(4), 821-867. DOI: 10.1007/s11257-019-09228-5

Wammes, J. D., Ralph, B. C. W., Mills, C., **Bosch, N.**, Duncan, T. L., & Smilek, D. (2019). Disengagement during lectures: Media multitasking and mind wandering in university classrooms. *Computers & Education, 132*, 76-89. DOI: 10.1016/j.compedu.2018.12.007

Bosch, N. & Paquette, L. (2018). Metrics for discrete student models: Chance levels, comparisons, and use cases. *Journal of Learning Analytics, 5*(2), 86-104. DOI: 10.18608/jla.2018.52.6

Bosch, N. & D'Mello, S. K. (2017). The affective experience of novice computer programmers. *International Journal of Artificial Intelligence in Education, 27*(1), 181-206. DOI: 10.1007/s40593-015-0069-5

Monkaresi, H., **Bosch, N.**, Calvo, R. A., & D'Mello, S. K. (2017). Automated detection of engagement using video-based estimation of facial expressions and heart rate. *IEEE Transactions on Affective Computing, 8*(1), 15-28. DOI: 10.1109/TAFFC.2016.2515084

Bosch, N., D'Mello, S. K., Ocumpaugh, J., Baker, R. S., & Shute, V. (2016). Using video to automatically detect learner affect in computer-enabled classrooms. *ACM Transactions on Interactive Intelligent Systems (TiiS), 6*(2), 17:1-17:26. DOI: 10.1145/2946837

Shute, V. J., D'Mello, S. K., Baker, R., Cho, K., **Bosch, N.**, Ocumpaugh, J., Ventura, M., & Almeda, V. (2015). Modeling how incoming knowledge, persistence, affective states, and in-game progress influence student learning from an educational game. *Computers & Education, 86*, 224-235. DOI: 10.1016/j.compedu.2015.08.001

Peer-reviewed Published Conference Proceedings

Tang, L. & **Bosch, N.** (in press). Can students understand AI decisions based on variables extracted via AutoML? *Proceedings of the 2024 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*.

Belitz, C., Lee, H., Nasiar, N., Fancsali, S. E., Ritter, S., Almoubayyed, H., Baker, R. S., Ocumpaugh, J., & **Bosch, N.** (2024). Hierarchical dependencies in classroom settings influence algorithmic bias metrics. *Proceedings of the 14th International Conference on Learning Analytics & Knowledge (LAK '24)*, pp. 210-218. DOI: 10.1145/3636555.3636869

Bosch, N., Williams-Dobosz, D., & Perry, M. (2024). Measuring help-seeking in online course discussion forums with privacy-preserving large language models. In J. Clarke-Midura, I. Kollar, X. Gu, & C. D'Angelo (Eds.), *Proceedings of the 16th International Conference of the Learning Sciences - CSCL 2024*, pp. 189-192. DOI: 10.22318/cscl2024.507823

Bosch, N., Reyes Denis, T., & Perry, M. (2024). Teacher learning online: Detecting patterns of engagement. In R. Lindgren, T. Asino, E. A. Kyza, C. K. Looi, D. T. Keifert, & E. Suárez (Eds.), *Proceedings of the 18th International Conference of the Learning Sciences - ICLS 2024*, pp. 1047-1050. DOI: 10.22318/icls2024.106829

Jiang, L. & **Bosch, N.** (2024). Short answer scoring with GPT-4. *Proceedings of the 11th ACM Conference on Learning@Scale (L@S '24)*, pp. 438-442. DOI: 10.1145/3657604.3664685

Jiang, L., Belitz, C., & **Bosch, N.** (2024). Synthetic dataset generation for fairer unfairness research. *Proceedings of the 14th International Conference on Learning Analytics & Knowledge (LAK '24)*, pp. 200-209. DOI: 10.1145/3636555.3636868

Hur, P., Machaka, N., Krist, C., & **Bosch, N.** (2023). Informing expert feature engineering through automated approaches: Implications for coding qualitative classroom video data. *Proceedings of the 13th International Conference on Learning Analytics & Knowledge (LAK '23)*, pp. 630-636. DOI: 10.1145/3576050.3576090

Jeng, A., **Bosch, N.**, & Perry, M. (2023). Perceived helpfulness of phatic expressions in online help-giving interactions. *Proceedings of the 17th International Conference of the Learning Sciences - ICLS 2023*, pp. 1780-1781.

Pinto, J., Paquette, L., & **Bosch, N.** (2023). Interpretable neural networks vs. expert-defined models for learner behavior detection. *Companion Proceedings 13th International Conference on Learning Analytics & Knowledge (LAK23)*, pp. 105-107.

Zong, R., Zhang, Y., Stinar, F., Shang, L., Zeng, H., **Bosch, N.**, & Wang, D. (2023). A crowd–AI collaborative approach to address demographic bias for student performance prediction in online education. *Proceedings of the 11th AAAI Conference on Human Computation and Crowdsourcing (HCOMP 2023)*, pp. 198-210. DOI: 10.1609/hcomp.v11i1.27560

Denny, P., Becker, B. A., **Bosch, N.**, Prather, J., Reeves, B., & Whalley, J. (2022). Novice reflections during the transition to a new programming language. *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education (SIGCSE)*, pp. 948-954. DOI: 10.1145/3478431.3499314

Hur, P., Lee, H., Bhat, S., & **Bosch, N.** (2022). Using machine learning explainability methods to personalize interventions for students. *Proceedings of the 15th International Conference on Educational Data Mining (EDM 2022)*, pp. 438-445. DOI: 10.5281/zenodo.6853181

Hur, P. & **Bosch, N.** (2022). Tracking individuals in classroom videos via post-processing OpenPose data. *Proceedings of the 12th International Conference on Learning Analytics & Knowledge (LAK '22)*, pp. 465-471. DOI: 10.1145/3506860.3506888

Jiang, L. & **Bosch, N.** (2022). Mining and assessing anomalies in students' online learning activities with self-supervised machine learning. *Proceedings of the 15th International Conference on Educational Data Mining (EDM 2022)*, pp. 549-554. DOI: 10.5281/zenodo.6852948

Prather, J., Margulieux, L., Whalley, J., Denny, P., Reeves, B. N., Becker, B. A., Singh, P., Powell, G., & **Bosch, N.** (2022). Getting by with help from my friends: Group study in introductory programming understood as socially shared regulation. *Proceedings of the 18th ACM Conference on International Computing Education Research (ICER 2022)*, pp. 164–176. DOI: 10.1145/3501385.3543970

Stinar, F. & **Bosch, N.** (2022). Algorithmic unfairness mitigation in student models: When fairer methods lead to unintended results. *Proceedings of the 15th International Conference on Educational Data Mining (EDM 2022)*, pp. 606-611. DOI: 10.5281/zenodo.6853135

Belitz, C., Jiang, L., & **Bosch, N.** (2021). Automating procedurally fair feature selection in machine learning. *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (AIES '21)*, pp. 379-389. DOI: 10.1145/3461702.3462585

Bosch, N., Zhang, Y., Paquette, L., Baker, R. S., Ocumpaugh, J., & Biswas, G. (2021). Students' verbalized metacognition during computerized learning. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21)*, pp. 680:1-680:12. DOI: 10.1145/3411764.3445809

Hutt, S., Ocumpaugh, J., Andres, J. M. A. L., Munshi, A., **Bosch, N.**, Baker, R. S., Zhang, Y., Paquette, L., Slater, S., & Biswas, G. (2021). Who's stopping you? Using microanalysis to explore the impact of science anxiety on self-regulated learning operations. *Proceedings of the Annual Meeting of the Cognitive Science Society*, pp. 1409-1415.

Hutt, S., Ocumpaugh, J., Andres, J. M. A. L., **Bosch, N.**, Paquette, L., Biswas, G., & Baker, R. S. (2021). Investigating SMART models of self-regulation and their impact on learning. *Proceedings of the 14th International Conference on Educational Data Mining (EDM 2021)*, pp. 580-587.

Jiang, L. & **Bosch, N.** (2021). Predictive sequential pattern mining via interpretable convolutional neural networks. *Proceedings of the 14th International Conference on Educational Data Mining (EDM 2021)*, pp. 761-766.

Williams-Dobosz, D., Azevedo, R. F. L., Jeng, A., Thakkar, V., Bhat, S., **Bosch, N.**, & Perry, M. (2021). A social network analysis of online engagement for college students traditionally underrepresented in STEM. *Proceedings of the 11th International Conference on Learning Analytics & Knowledge (LAK '21)*, pp. 207-215. DOI: 10.1145/3448139.3448159

Bosch, N., Crues, R. W., Shaik, N., & Paquette, L. (2020). "Hello, [REDACTED]": Protecting student privacy in analyses of online discussion forums. *Proceedings of the 13th International Conference on Educational Data Mining (EDM 2020)*, pp. 39-49.

D'Angelo, C., Dyer, E., Krist, C., Rosenberg, J., & **Bosch, N.** (2020). Advancing computational grounded theory for audiovisual data from mathematics classrooms. *Proceedings of the 14th International Conference on Learning Sciences (ICLS 2020)*, pp. 2393-2394.

Dyer, E., D'Angelo, C., **Bosch, N.**, Krist, C., & Rosenberg, J. (2020). Analyzing learning with speech analytics and computer vision methods: Technologies, principles, and ethics. *Proceedings of the 14th International Conference on Learning Sciences (ICLS 2020)*, pp. 2651-2653.

Gliser, I., Mills, C., **Bosch, N.**, Smith, S., Smilek, D., & Wammes, J. D. (2020). The sound of inattention: Predicting mind wandering with automatically derived features of instructor speech. In I. I. Bittencourt, M. Cukurova, K. Muldner, R. Luckin, & E. Millán (Eds.), *Proceedings of the 21st International Conference on Artificial Intelligence in Education (AIED 2020)*, pp. 204-215. DOI: 10.1007/978-3-030-52237-7_17

Hoang, L., Boyce, R. D., **Bosch, N.**, Stottlemyer, B. A., Brochhausen, M., & Schneider, J. (2020). Automatically classifying the evidence type of drug-drug interaction research papers as a step toward computer supported evidence curation. *Proceedings of the American Medical Informatics Association (AMIA) Annual Meeting*, pp. 554-562.

Hur, P., **Bosch, N.**, Paquette, L., & Mercier, E. (2020). Harbingers of collaboration? The role of early-class behaviors in predicting collaborative problem solving. *Proceedings of the 13th International Conference on Educational Data Mining (EDM 2020)*, pp. 104-114.

Jay, V., Henricks, G. M., Anderson, C. J., Angrave, L., **Bosch, N.**, Williams-Dobosz, D., Shaik, N., Bhat, S., & Perry, M. (2020). Online discussion forum help-seeking behaviors of students underrepresented in STEM. *Proceedings of the 14th International Conference on Learning Sciences (ICLS 2020)*, pp. 809-810.

Sanyal, D., **Bosch, N.**, & Paquette, L. (2020). Feature selection metrics: Similarities, differences, and characteristics of the selected models. *Proceedings of the 13th International Conference on Educational Data Mining (EDM 2020)*, pp. 212-223.

Valdiviejas, H. & **Bosch, N.** (2020). Using association rule mining to uncover rarely occurring relationships in two university online STEM courses: A comparative analysis. *Proceedings of the 13th International Conference on Educational Data Mining (EDM 2020)*, pp. 686-690.

Zhang, Y., Paquette, L., Baker, R. S., Ocumpaugh, J., **Bosch, N.**, Munshi, A., & Biswas, G. (2020). The relationship between confusion and metacognitive strategies in Betty's Brain. *Proceedings of the 10th International Conference on Learning Analytics and Knowledge (LAK20)*, pp. 276-284. DOI: 10.1145/3375462.3375518

Andres, A., Ocumpaugh, J., Baker, R. S., Slater, S., Paquette, L., Jiang, Y., **Bosch, N.**, Munshi, A., Moore, A. L., & Biswas, G. (2019). Affect sequences and learning in Betty's Brain. In C. Brooks, R.

Ferguson, & H. U. Hoppe (Eds.), *Proceedings of the 9th International Conference on Learning Analytics & Knowledge (LAK19)*, pp. 383-390. DOI: 10.1145/3303772.3303807

Bosch, N., Huang, E., Angrave, L., & Perry, M. (2019). Modeling improvement for underrepresented minorities in online STEM education. *Proceedings of the 27th Conference on User Modeling, Adaptation and Personalization (UMAP 2019)*, pp. 327-335. DOI: 10.1145/3320435.3320463

Huang, E., Valdiviejas, H., & **Bosch, N.** (2019). I'm sure! Automatic detection of metacognition in online course discussion forums. *Proceedings of the 8th International Conference on Affective Computing and Intelligent Interaction (ACII 2019)*, pp. 241-247. DOI: 10.1109/ACII.2019.8925506

Mills, C., **Bosch, N.**, Krasich, K., & D'Mello, S. K. (2019). Reducing mind wandering during vicarious learning from an intelligent tutoring system. In S. Isotani, E. Millán, A. Ogan, P. Hastings, B. McLaren, & R. Luckin (Eds.), *Proceedings of the 20th International Conference on Artificial Intelligence in Education (AIED 2019)*, pp. 296-307. DOI: 10.1007/978-3-030-23204-7_25

Bosch, N., Mills, C., Wammes, J. D., & Smilek, D. (2018). Quantifying classroom instructor dynamics with computer vision. In C. Rosé, R. Martínez-Maldonado, H. U. Hoppe, R. Luckin, M. Mavrikis, K. Porayska-Pomsta, B. McLaren, & B. du Boulay (Eds.), *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)*, pp. 30-42. DOI: 10.1007/978-3-319-93843-1_3

Bosch, N., Crues, R. W., Henricks, G. M., Perry, M., Angrave, L., Shaik, N., Bhat, S., & Anderson, C. J. (2018). Modeling key differences in underrepresented students' interactions with an online STEM course. *Proceedings of TechMindSociety '18*, pp. 6:1-6:6. DOI: 10.1145/3183654.3183681

Bosch, N., Crues, R. W., & Shaik, N. (2018). Diverse learners, diverse motivations: Exploring the sentiment of learning objectives. In K. E. Boyer & M. V. Yudelson (Eds.), *Proceedings of the 11th International Conference on Educational Data Mining (EDM 2018)*, pp. 553-556.

Crues, R. W., **Bosch, N.**, Anderson, C. J., Perry, M., Bhat, S., & Shaik, N. (2018). Who they are and what they want: Understanding the reasons for MOOC enrollment. In K. E. Boyer & M. V. Yudelson (Eds.), *Proceedings of the 11th International Conference on Educational Data Mining (EDM 2018)*, pp. 177-186.

Crues, R. W., **Bosch, N.**, Perry, M., Angrave, L., Shaik, N., & Bhat, S. (2018). Refocusing the lens on engagement in MOOCs. In R. Luckin, S. Klemmer, & K. R. Koedinger (Eds.), *Proceedings of the 5th ACM Conference on Learning@Scale (L@S 2018)*, pp. 11:1-11:10. DOI: 10.1145/3231644.3231658

Jiang, Y., **Bosch, N.**, Baker, R. S., Paquette, L., Ocumpaugh, J., Andres, J. M. A. L., Moore, A. L., & Biswas, G. (2018). Expert feature-engineering vs. deep neural networks: Which is better for sensor-free affect detection? In C. P. Rosé, R. Martínez-Maldonado, H. U. Hoppe, R. Luckin, M. Mavrikis, K. Porayska-Pomsta, B. McLaren, & B. du Boulay (Eds.), *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)*, pp. 198-211. DOI: 10.1007/978-3-319-93843-1_15

Paquette, L., **Bosch, N.**, Mercier, E., Jung, J., Shehab, S., & Tong, Y. (2018). Matching data-driven models of group interactions to video analysis of collaborative problem solving on tablet computers. In J. Kay & R. Luckin (Eds.), *Proceedings of the 13th International Conference of the Learning Sciences (ICLS 2018)*, 312-319.

D'Mello, S. K., Mills, C., Bixler, R., & **Bosch, N.** (2017). Zone out no more: Mitigating mind wandering during computerized reading. In X. Hu, T. Barnes, A. Hershkovitz, & L. Paquette (Eds.), *Proceedings of the 10th International Conference on Educational Data Mining (EDM 2017)*, pp. 8-15.

Hutt, S., Mills, C., **Bosch, N.**, Krasich, K., Brockmole, J., & D'Mello, S. K. (2017). Out of the fr-"eye"-ing pan: Towards gaze-based models of attention during learning with technology in the classroom. *Proceedings of the 2017 Conference on User Modeling, Adaptation, and Personalization (UMAP 2017)*, pp. 94-103. DOI: 10.1145/3079628.3079669

Khan, S., Suendermann-Oeft, D., Evanini, K., Williamson, D. M., Paris, S., Qian, Y., Huang, Y., **Bosch, N.**, D'Mello, S. K., Loukina, A., & Davis, L. (2017). MAP: Multimodal assessment platform for interactive communication competency. In S. Shehata & J. P. Tan (Eds.), *Practitioner Track Proceedings of the 7th International Conference on Learning Analytics & Knowledge (LAK17)*, pp. 6-12.

Stewart, A., **Bosch, N.**, & D'Mello, S. K. (2017). Generalizability of face-based mind wandering detection across task contexts. In X. Hu, T. Barnes, A. Hershkovitz, & L. Paquette (Eds.), *Proceedings of the 10th International Conference on Educational Data Mining (EDM 2017)*, pp. 88-95.

Stewart, A., **Bosch, N.**, Chen, H., Donnelly, P. J., & D'Mello, S. K. (2017). Face forward: Detecting mind wandering from video during narrative film comprehension. In E. André, R. S. Baker, X. Hu, M. M. T. Rodrigo, & B. du Boulay (Eds.), *Proceedings of the 18th International Conference on Artificial Intelligence in Education (AIED 2017)*, pp. 359-370. DOI: 10.1007/978-3-319-61425-0_30

Bosch, N. (2016). Detecting student engagement: Human versus machine. *Proceedings of the 2016 Conference on User Modeling, Adaptation, and Personalization (UMAP 2016)*, pp. 317-320. DOI: 10.1145/2930238.2930371

Bosch, N., D'Mello, S. K., Baker, R. S., Ocumpaugh, J., Shute, V. J., Ventura, M., Wang, L., & Zhao, W. (2016). Detecting student emotions in computer-enabled classrooms. *Proceedings of the 25th International Joint Conference on Artificial Intelligence (IJCAI 2016)*, pp. 4125-4129.

D'Mello, S. K., Kopp, K., Bixler, R., & **Bosch, N.** (2016). Attending to attention: Detecting and combating mind wandering during computerized reading. *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, pp. 1661-1669. DOI: 10.1145/2851581.2892329

Dillon, J., **Bosch, N.**, Chetlur, M., Wanigasekara, N., Ambrose, G. A., Sengupta, B., & D'Mello, S. K. (2016). Student emotion, co-occurrence, and dropout in a MOOC context. In T. Barnes, M. Chi, & M. Feng (Eds.), *Proceedings of the 9th International Conference on Educational Data Mining (EDM 2016)*, pp. 353-357.

Stewart, A., **Bosch, N.**, Chen, H., Donnelly, P. J., & D'Mello, S. K. (2016). Where's your mind at? Video-based mind wandering detection during film viewing. *Proceedings of the 2016 Conference on User Modeling, Adaptation, and Personalization (UMAP 2016)*, pp. 295-296. DOI: 10.1145/2930238.2930266

Bosch, N., D'Mello, S. K., Baker, R. S., Ocumpaugh, J., & Shute, V. J. (2015). Temporal generalizability of face-based affect detection in noisy classroom environments. In C. Conati, N. T. Heffernan, A. Mitrovic, & M. Felisa Verdejo (Eds.), *Proceedings of the 17th International Conference on Artificial Intelligence in Education (AIED 2015)*, pp. 44-53. DOI: 10.1007/978-3-319-19773-9_5

Bosch, N. (2015). Multimodal affect detection in the wild: Accuracy, availability, and generalizability. *Proceedings of the 17th International Conference on Multimodal Interaction (ICMI 2015 doctoral consortium)*, pp. 645-649. DOI: 10.1145/2818346.2823316

Bosch, N., D'Mello, S. K., Baker, R. S., Ocumpaugh, J., Shute, V. J., Ventura, M., Wang, L., & Zhao, W. (2015). Automatic detection of learning-centered affective states in the wild. *Proceedings of the 2015 International Conference on Intelligent User Interfaces (IUI 2015)*, pp. 379-388. DOI: 10.1145/2678025.2701397

Bosch, N., Chen, H., Baker, R., Shute, V., & D'Mello, S. K. (2015). Accuracy vs. availability heuristic in multimodal affect detection in the wild. *Proceedings of the 17th International Conference on Multimodal Interaction (ICMI 2015)*, pp. 267-274. DOI: 10.1145/2818346.2820739

Chen, Y., **Bosch, N.**, & D'Mello, S. K. (2015). Video-based affect detection in noninteractive learning environments. In C. Romero, M. Pechenizkiy, J. Boticario, & O. Santos (Eds.), *Proceedings of the 8th International Conference on Educational Data Mining (EDM 2015)*, pp. 440-443.

Kai, S., Paquette, L., Baker, R., **Bosch, N.**, D'Mello, S. K., Ocumpaugh, J., Shute, V. J., & Ventura, M. (2015). A comparison of face-based and interaction-based affect detectors in Physics Playground. In C. Romero, M. Pechenizkiy, J. Boticario, & O. Santos (Eds.), *Proceedings of the 8th International Conference on Educational Data Mining (EDM 2015)*, pp. 77-84.

Mills, C., D'Mello, S. K., **Bosch, N.**, & Olney, A. (2015). Mind wandering during learning with an intelligent tutoring system. In C. Conati, N. T. Heffernan, A. Mitrovic, & M. Felisa Verdejo (Eds.), *Proceedings of the 17th International Conference on Artificial Intelligence in Education (AIED 2015)*, pp. 267-276. DOI: 10.1007/978-3-319-19773-9_27

Bosch, N., Chen, Y., & D'Mello, S. K. (2014). It's written on your face: Detecting affective states from facial expressions while learning computer programming. In S. Trausan-Matu, K. E. Boyer, M. Crosby, & K. Panourgia (Eds.), *Proceedings of the 12th International Conference on Intelligent Tutoring Systems (ITS 2014)*, pp. 39-44. DOI: 10.1007/978-3-319-07221-0_5

Bosch, N. & D'Mello, S. K. (2014). It takes two: Momentary co-occurrence of affective states during computerized learning. In S. Trausan-Matu, K. E. Boyer, M. Crosby, & K. Panourgia (Eds.), *Proceedings of the 12th International Conference on Intelligent Tutoring Systems (ITS 2014)*, pp. 638-639. DOI: 10.1007/978-3-319-07221-0_89

Mills, C., **Bosch, N.**, Graesser, A., & D'Mello, S. K. (2014). To quit or not to quit: Predicting future behavioral disengagement from reading patterns. In S. Trausan-Matu, K. E. Boyer, M. Crosby, & K. Panourgia (Eds.), *Proceedings of the 12th International Conference on Intelligent Tutoring Systems (ITS 2014)*, pp. 19-28. DOI: 10.1007/978-3-319-07221-0_3

Rodeghero, P., McMillan, C., McBurney, P. W., **Bosch, N.**, & D'Mello, S. K. (2014). Improving automated source code summarization via an eye-tracking study of programmers. *Proceedings of the 36th International Conference on Software Engineering (ICSE 2014)*, pp. 390–401. DOI: 10.1145/2568225.2568247

Bosch, N., D'Mello, S. K., & Mills, C. (2013). What emotions do novices experience during their first computer programming learning session? In H. C. Lane, K. Yacef, J. Mostow, & P. Pavlik (Eds.), *Proceedings of the 16th International Conference on Artificial Intelligence in Education (AIED 2013)*, pp. 11-20. DOI: 10.1007/978-3-642-39112-5_2

Bosch, N. & D'Mello, S. K. (2013). Programming with your heart on your sleeve: Analyzing the affective

states of computer programming students. In H. C. Lane, K. Yacef, J. Mostow, & P. Pavlik (Eds.), *Proceedings of the 16th International Conference on Artificial Intelligence in Education (AIED 2013)*, pp. 908-911. DOI: 10.1007/978-3-642-39112-5_143

Mills, C., D'Mello, S. K., Lehman, B., **Bosch, N.**, Strain, A., & Graesser, A. (2013). What makes learning fun? Exploring the influence of choice and difficulty on mind wandering and engagement during learning. In H. C. Lane, K. Yacef, J. Mostow, & P. Pavlik (Eds.), *Proceedings of the 16th International Conference on Artificial Intelligence in Education (AIED 2013)*, pp. 71-80. DOI: 10.1007/978-3-642-39112-5_8

Book Chapters

Hutt, S., Baker, R. S., Ocumpaugh, J., Munshi, A., Andres, J. M. A. L., Karumbaiah, S., Slater, S., Biswas, G., Paquette, L., **Bosch, N.**, & van Velsen, M. (2022). Quick Red Fox: An app supporting a new paradigm in qualitative research on AIED for STEM. *Artificial Intelligence in STEM Education*, pp. 319-332.

Paquette, L. & **Bosch, N.** (2020). The invisible breadcrumbs of digital learning: How learner actions inform us of their experience. *Handbook of Research on Digital Learning*, pp. 302-316. DOI: 10.4018/978-1-5225-9304-1.ch019

D'Mello, S. K., **Bosch, N.**, & Chen, H. (2018). Multimodal-multisensor affect detection. *The Handbook of Multimodal-Multisensor Interfaces, Volume 2: Signal Processing, Architectures, and Detection of Emotion and Cognition*, pp. 167-202. DOI: 10.1145/3107990.3107998

Peer-reviewed Workshop Papers

Lee, H., Hur, P., Bhat, S., & **Bosch, N.** (2021). Promoting self-regulated learning in online learning by triggering tailored interventions. In R. S. Baker, C. Mills, & U. Boser (Eds.), *CEUR Workshop Proceedings: Joint Workshops at the International Conference on Educational Data Mining*, 1-8.

Bosch, N. & Paquette, L. (2017). Unsupervised deep autoencoders for feature extraction with educational data. *Deep Learning with Educational Data Workshop at the 10th International Conference on Educational Data Mining*.

Bosch, N. & D'Mello, S. K. (2014). Co-occurring affective states in automated computer programming education. In E. Walker & C. K. Looi (Eds.), *Proceedings of the Workshop on AI-supported Education for Computer Science (AIEDCS) at the 12th International Conference on Intelligent Tutoring Systems*, pp. 21-30.

Bosch, N. & D'Mello, S. K. (2013). Sequential patterns of affective states of novice programmers. In E. Walker & C. K. Looi (Eds.), *Proceedings of the First Workshop on AI-supported Education for Computer Science (AIEDCS 2013)*, pp. 1-10.

Invited Talks/Seminars

- *Privacy and Big Data in Postsecondary Education*. Building a Multidimensional Future: A Conversation on Big Data and Educational Measurement, National Council on Measurement in Education Annual Meeting. June 1, 2021.
- *Learning about Learning from Unstructured Classroom Data*. AAAI Spring Symposium on Artificial Intelligence for K–12 Education. March 22, 2021.

- *Hyperparameter Tuning in Machine Learning for Student Models*. Learning Analytics Learning Network. October 20, 2020.

Teaching and Mentorship

Teaching Activities

- Instructor, *Causal Inference with Machine Learning* (EPSY 590ML) – fall 2023
  - **Newly developed course**
- Instructor, *Concepts of Machine Learning* (IS 390CML) – spring 2022, fall 2022, spring 2023
  - **Newly developed course**
- Instructor, *Data, Statistical Models, and Information* (IS 542/507) – fall 2019, spring 2020, fall 2020, fall 2021
- Instructor, *Applied Machine Learning: Team Projects* (IS 590ML/557) – spring 2019, fall 2019, spring 2021, spring 2024
  - **Newly developed course**
- Instructor, *Foundations of Information Processing* (IS 452) – spring 2019
- Instructor, *Data Mining* (IS 590DT2/577) – fall 2018, fall 2020
- Co-instructor, *Machine Learning Team Projects* (IS 590ML) – fall 2018
- Information Sciences independent study advisor (IS 592/589) – fall 2019 (1), spring 2020 (3), fall 2020 (1), spring 2021 (2), summer 2021 (1), spring 2022 (2), summer 2022 (4)
- Information Sciences undergraduate independent study advisor (IS 389) – spring 2022 (1)
- Educational Psychology independent study advisor (EPSY 595) – fall 2020 (1), summer 2021 (1), spring 2022 (1), fall 2022 (1)
- Informatics independent study advisor (INFO 597) – fall 2020 (1)
- Informatics individual undergraduate research (INFO 199/399) – fall 2020 (1), spring 2021 (1), spring 2022 (1)
- Guest Lecturer, *AI Applications in Education* (CS 498)
- Guest Lecturer, *Research Design for Information Sciences* (IS 204)
- Guest Lecturer, *Advanced Topics: Machine Learning & Social Computing* (IS 590MSC)
- Guest Lecturer, *Introduction to Educational Data Mining* (CI 507EDM)
- Guest Lecturer, *Qualitative Analysis of Video Data* (CI 507AVD)

Doctoral Advising

- Clara Belitz – Information Sciences
- Lan Jiang – Information Sciences
- Paul Hur – Information Sciences (Secondary co-advisor with Michael Twidale)
- HaeJin Lee – Information Sciences
- Frank Stinar – Information Sciences
- Liang Tang – Information Sciences (Secondary co-advisor with Masooda Bashir)
- Destiny Williams-Dobosz – Educational Psychology (Secondary co-advisor with Michelle Perry)
- Hannah Valdiviejas (graduated 2023) – Educational Psychology (Secondary co-advisor with Michelle Perry)

Master's Students Mentored

- Sree Balasubramanian, MS in Information Management, 2022–2023, First employment: Analytics Rotation Program Manager at Genentech
- Rohan Salvi, MS in Information Management, 2022–2023, First employment: PhD student at University of Illinois Chicago
- Vel Wu, MS in Information Management, 2020, First employment: Data engineer at Groundhog Technologies
- Aditya Kadrekar, MS in Information Management, 2020, First employment: Data scientist at Cargill, Inc.
- Lan Jiang, MS in Information Management (2019–2020, First employment: PhD student at UIUC)
- Tre Tomaszewski, MS in Bioinformatics (2019–2020, First employment: PhD student at UIUC)
- Jinlin Zeng, MS in Information Management (2018–2019)

Undergraduate Students Mentored

- Stefan Chu (2023–2024, First employment: Graduate student at Harvard University)
- Ziwei Wang (2023–2024)
- Ved Shah (2021, SPIN—*Students Pushing INnovation* intern, First employment: Graduate student at Northwestern University)
- HaeJin Lee (2021, First employment: Graduate student at UIUC)
- Alistair Nunn (2020–2021)
- Zihan (Crescent) Xiong (2020–2022, First employment: Graduate student at UPenn)
- Debopam Sanyal (2019–2020, SPIN—*Students Pushing INnovation* intern, First employment: Graduate student at UIUC)
- Lauren Gregory (2019)
- Dean Lin (2018–2019, SPIN—*Students Pushing INnovation* intern)
- Eddie Huang (2018–2019, First employment: Graduate student at UIUC)
- Zhuoyue Wang (2018–2019, First employment: Graduate student at UC Berkeley)
- Yuxuan Chen (Notre Dame; 2013–2016, First employment: Graduate student at Columbia University)
- Huili Chen (Notre Dame; 2015–2016, First employment: Graduate student at Massachusetts Institute of Technology)
- Jianan Wang (Notre Dame; 2016)
- Jacob Beiter (Notre Dame; 2016)
- Timothy Pusateri (Notre Dame; 2015)

Professional Activities

Journal and Proceedings Editing

- Accessibility Production Editor, *Journal of Educational Data Mining* (2023–present)
- Co-editor, special issue of the APA *Technology, Mind, and Behavior* journal on "Understanding Involuntary Thought and Affect through Big Data and AI" (2023–present)
- Co-editor, special issue of the *Journal of Educational Data Mining* on extended follow-ups to the best papers from EDM 2022 (December 2022)

- Co-editor, *Proceedings of the 15th International Conference on Educational Data Mining (EDM 2022)*

Journal Reviews

- ACM Transactions on Computer–Human Interaction (TOCHI)
- ACM Transactions on Human–Robot Interaction (THRI)
- ACM Transactions on Knowledge Discovery from Data (TKDD)
- Addiction
- American Educational Research Association Open (AERA Open)
- American Educational Research Journal (AERJ)
- Behavior Research Methods (BRM)
- British Journal of Educational Technology (BJET)
- Computers & Education
- Contemporary Educational Psychology
- IEEE Transactions on Affective Computing (TAFFC)
- IEEE Transactions on Learning Technologies (TLT)
- Image and Vision Computing (IMAVIS)
- International Journal of Artificial Intelligence in Education (IJAIED)
- International Journal of Human–Computer Interaction (IJHCI)
- International Journal of STEM Education
- Journal of Educational Data Mining (JEDM)
- Journal of Educational Psychology
- Journal of Learning Analytics (JLA)
- Learning and Individual Differences
- Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
- Psychometrika
- The Internet and Higher Education

Conference Reviews (Program Committee)

- AAAI Conference on Artificial Intelligence
- ACM CHI Conference on Human Factors in Computing Systems
- ACM Conference on Computer-Supported Cooperative Work and Social Computing
- ACM Conference on Fairness, Accountability, and Transparency (FAccT)
- Conference on Neural Information Processing Systems (NeurIPS)
- IEEE Conference on Automatic Face and Gesture Recognition (FG)
- IEEE Winter Conference on Applications of Computer Vision (WACV)
- International Conference of the Learning Sciences (ICLS)
- International Conference on Affective Computing and Intelligent Interaction (ACII)
- International Conference on Educational Data Mining (EDM)
- International Learning Analytics and Knowledge (LAK) Conference

Conference Associate Chair/Senior Program Committee

- ACM CHI Conference on Human Factors in Computing Systems
- ACM International Conference on Multimodal Interaction (ICMI)
- International Conference on Artificial Intelligence in Education (AIED)

Conference Chairing

- Accessibility Chair, Educational Data Mining (EDM) Conference, 2024
- Program Committee Co-chair, Educational Data Mining (EDM) Conference, 2022
- Industry Track Co-chair, Educational Data Mining (EDM) Conference, 2020

Workshop Organization

- Co-chair/organizer, *Fairness, Accountability, and Transparency in Educational Data* workshop held at the Educational Data Mining 2020 conference (https://fatedm.inria.fr/)

Workshop and Symposium Reviews

- AAAI Workshop on AI Education
- APA Technology, Mind, and Society (TMS)
- EDMGAMES Workshop at the Educational Data Mining Conference
- EuroCSS Workshop on Biases in Social Computing Data and Technology
- IJCAI Workshop on Artificial Intelligence in Affective Computing
- International Workshop on Empathetic Computing
- NeurIPS Workshop on Generative AI for Education (GAIED)
- Society of Research on Educational Effectiveness Spring Conference (SREE)

Grant/Fellowship Proposals Reviews and Panels

- Ad-hoc reviewer, UIUC Andrew T. Yang Research and Entrepreneurship Award, 2024
- Ad-hoc reviewer, UIUC Chancellor's Call to Action Research Projects, 2024
- Ad-hoc reviewer, Tools Competition (The Learning Agency), 2023–2024
- Panel chair, Institute of Education Sciences (IES), 2024
- Panelist, Institute of Education Sciences (IES), 2021, 2023
- Ad-hoc reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC), 2021–2022
- Ad-hoc reviewer, National Institutes of Health (NIH), 2021
- Panelist, National Science Foundation (NSF) Directorate for STEM Education, 2021–2023
- Ad-hoc reviewer, UIUC Technology Innovation in Educational Research and Design (TIER-ED) Pilot Projects, 2021
- Ad-hoc reviewer, UIUC Technology Innovation in Educational Research and Design (TIER-ED) Student Fellows, 2020
- Panelist, National Science Foundation (NSF) Directorate for Computer and Information Science and Engineering (CISE), 2020
- Ad-hoc reviewer, UIUC Campus Research Board, 2020–2022
- Ad-hoc reviewer, National Center for Supercomputing Applications (NCSA) Faculty Fellows, 2017

Professional Memberships (Past and Current)

- American Educational Research Association (AERA) Division C
- Association for the Advancement of Affective Computing (AAAC)
- Association for Computing Machinery (ACM)
- International Artificial Intelligence in Education Society
- International Educational Data Mining Society
- International Society of the Learning Sciences (ISLS)

Campus Committees

- Space Policy Taskforce, College of Education, UIUC, 2023–2024
- AI Curriculum Committee, School of Information Sciences, UIUC, 2023–2024
- Doctoral Studies Committee, School of Information Sciences, UIUC, 2022–2023
- MS/IM Program Committee, School of Information Sciences, UIUC, 2019–2022
- Research Advisory Committee, School of Information Sciences, UIUC, 2019–2023
- Admissions Committee, School of Information Sciences, UIUC, 2019
- University of Notre Dame Computer Science Graduate Student Board, 2014–2015, 2015–2016

Other Service and Outreach

- HackIllinois Mentor, 2023
- STEM For All Video Showcase Presenter (TERC), 2020, 2021, 2022
- Illinois Science Olympiad State Tournament Judge, 2017–2019
- Northern Indiana Regional Science and Engineering Fair Judge, 2015, 2016
- Notre Dame National Robotics Week Presenter, 2013