John P. Lalor

john.lalor@nd.edu
http://www.johnlalor.net/

Employment History

2020 – present	**Assistant Professor.** IT, Analytics, and Operations Department, University of Notre Dame Mendoza College of Business Computer Science and Engineering Department (concurrent), College of Engineering Department of Medicine (adjunct), Indiana University School of Medicine South Bend
2019	**Instructor.** IT, Analytics, and Operations Department, University of Notre Dame Mendoza College of Business
2017 – 2018	**Applied Scientist Intern.** Amazon Alexa, Cambridge, MA
2016	**Research Intern.** ESPN Advanced Technology Group, Bristol, CT
2013 – 2015	**Software Developer.** Eze Software Group, Chicago, IL
2011 – 2013	**Advisory Associate.** KPMG, Chicago, IL

Education

2020	**Ph.D. Computer Science, University of Massachusetts, Amherst** Thesis title: Learning Latent Characteristics of Data and Models using Item Response Theory. Advisor: Dr. Hong Yu
2015	**M.Sc. Computer Science, DePaul University**
2011	**B.B.A. IT Management, University of Notre Dame** Minor: Irish Language and Literature

Awards and Achievements

2025	**INFORMS Design Science Award** **Editors' Pick for Notable Papers**, ACM Transactions on Information Systems (TOIS). For *Should Fairness Be a Metric or a Model? A Model-based Framework for Assessing Bias in Machine Learning Pipelines*. **Mendoza Mission Research Award**, Mendoza College of Business, University of Notre Dame.
2022	**Zac Plantz Memorial Achievement Award**, IT, Analytics, and Operations Department, Mendoza College of Business, University of Notre Dame.
2021	**ICIS Best Theory Paper**, The Effect of Bots on Human Interaction in Online Communities.

Research Support

2024 – 2028	**NSF Collaborative Research Medium Award**, NSF, Award: $1.2M (ND Share: $339.3k) Title: Hard Data to the Model: Personalized, Diverse Preferences for Language Models Role: Co-PI. PI: Jordan Boyd-Graber. Other Co-PI's: Swabha Swayamdipta, Robin Jia, Alvin Grissom.
2020 – 2021	**Atlantic Coast Conference Innovation Initiative**. Award: $5,500 PI: John Lalor. Title: Development and validation of a multidimensional mental health screening instrument. **National Library of Medicine**. Award: $10,000 Subaward recipient: John Lalor. PI: Hong Yu. Title: Resource Curation and Evaluation for EHR Note Comprehension.
2020	**Notre Dame Faculty Research Support Program - Initiation Grant**. Award: $10,000 PI: John Lalor Title: Towards Automatic Generation of Electronic Health Record Note Comprehension Questions.

Publications

Journal Articles

15 Meng, G., Zeng, Q., **Lalor, J. P.**, & Yu, H. (2025). A Psychology-based unified dynamic framework for curriculum learning. *Computational Linguistics*, 1-49.

14 Krishnan, R., **Lalor, J. P.**, Prat, N., & Abbasi, A., (2025). From policy to practice: Research directions for trustworthy and responsible artificial intelligence "by design". *IEEE Intelligent Systems*, 40(5), 45-51.

13 Li, W., **Lalor, J. P.**, Chen, Y., & Kanuri, V. K. (2025). From stars to insights: Exploration and implementation of unified sentiment analysis with distant supervision. *ACM Transactions on Management Information Systems*, 16(3), 1-21.

12 Yang, Y., **Lalor, J. P.**, Abbasi, A., & Zeng, D. D. (2025). Hierarchical deep document model. *IEEE Transactions on Knowledge and Data Engineering*, 37(1), 351-364.

11 **Lalor, J. P.**, Abbasi, A., Oketch, K., Yang, Y., & Forsgren, N. (2024). Should fairness be a metric or a model? A model-based framework for assessing bias in machine learning pipelines. *ACM Transactions on Information Systems* (2024 impact factor: 9.1), 42(4), 1-41.
ACM TOIS Editors' Pick for Notable Papers.
Selected for presentation at ACM SIGIR 2024 (approximately 10-12% of annual TOIS publications are invited).
Mendoza Mission Research Award, 2025.

10 Safadi, H., **Lalor, J. P.**, & Berente, N. (2024). The effect of bots on human interaction in online communities. *MIS Quarterly*, 48(3), 1279-1296.

9 **Lalor, J. P.**, Levy, D. A., Jordan, H. S., Hu, W., Smirnova, J. K., & Yu, H. (2024). Evaluating expert-layperson agreement in identifying jargon terms in electronic health record notes: Observational study. *Journal of Medical Internet Research*, 26, e49704.

8 Levy, D. A., Jordan, H. S., **Lalor, J. P.**, Smirnova, J. K., Hu, W., Liu, W., & Yu, H. (2024). Individual factors that affect laypeople's understanding of definitions of medical jargon. *Health Policy and Technology*, 13(6), 100932.

7 **Lalor, J. P.**, & Rodriguez, P. (2023). py-irt: A scalable item response theory library for Python. *INFORMS Journal on Computing*, 35(1), 5-13.
INFORMS ISS Design Science Award, 2025.

6 Wowak, K. D., *Lalor, J. P.*, Somanchi, S., & Angst, C. M. (2023). Business analytics in healthcare: Past, present, and future trends. *Manufacturing & Service Operations Management*, 25(3), 975-995.

5 **Lalor, J. P.**, Wu, H., Mazor, K. M., & Yu, H. (2023). Evaluating the efficacy of NoteAid on EHR note comprehension among US Veterans through Amazon Mechanical Turk. *International Journal of Medical Informatics*, 172, 105006.

4 **Lalor, J. P.**, Hu, W., Tran, M., Wu, H., Mazor, K. M., & Yu, H. (2021). Evaluating the effectiveness of NoteAid in a community hospital setting: Randomized trial of electronic health record note comprehension interventions with patients. *Journal of Medical Internet Research*, 23(5), e26354.

3 Chen, J., **Lalor, J. P.**, Liu, W., Druhl, E., Granillo, E., Vimalananda, V. G., & Yu, H. (2019). Detecting hypoglycemia incidents reported in patients' secure messages: Using cost-sensitive learning and oversampling to reduce data imbalance. *Journal of Medical Internet Research*, 21(3), e11990.
Also presented at the *2018 American Medical Informatics Association (AMIA) Annual Symposium*.

2 **Lalor, J. P.**, Woolf, B., & Yu, H. (2019). Improving electronic health record note comprehension with NoteAid: Randomized trial of electronic health record note comprehension interventions with crowdsourced workers. *Journal of Medical Internet Research*, 21(1), e10793.

1 **Lalor, J. P.**, Wu, H., Chen, L., Mazor, K. M., & Yu, H. (2018). ComprehENotes, an instrument to assess patient reading comprehension of electronic health record notes: Development and validation. *Journal of Medical Internet Research*, 20(4), e139.
Also presented at the *2017 American Medical Informatics Association (AMIA) Annual Symposium*.

Computer Science Conference Proceedings

Note: This list includes papers in computer science conference proceedings that have been listed as "Top Conferences" according to the NYU Technology, Operations and Statistics Department Top Publication Venues (link).

8 **Lalor, J. P.**, Qin, R., Dobolyi, D., & Abbasi, A. (2025, July). Textagon: Boosting language models with theory-guided parallel representations. *In Proceedings of the 63rd Annual Meeting of the Association for Computational Linguistics (Volume 3: System Demonstrations)* (pp. 82-92).

Publications (continued)

7 Cook, R. A., **Lalor, J. P.**, & Abbasi, A. (2025, April). No simple answer to data complexity: An examination of instance-level complexity metrics for classification tasks. *In Proceedings of the 2025 Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics: Human Language Technologies (Volume 1: Long Papers)* (pp. 2553-2573).

6 **Lalor, J. P.**, Yang, Y., Smith, K., Forsgren, N., & Abbasi, A. (2022, July). Benchmarking intersectional biases in NLP. In *Proceedings of the 2022 conference of the North American chapter of the association for computational linguistics: Human language technologies* (pp. 3598-3609).

5 Abbasi, A., Dobolyi, D., **Lalor, J. P.**, Netemeyer, R. G., Smith, K., & Yang, Y. (2021, November). Constructing a psychometric testbed for fair natural language processing. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing* (pp. 3748-3758).
Authors listed alphabetically

4 Rodriguez, P., Barrow, J., Hoyle, A. M., **Lalor, J. P.**, Jia, R., & Boyd-Graber, J. (2021, August). Evaluation examples are not equally informative: How should that change NLP leaderboards?. In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (Volume 1: Long Papers)* (pp. 4486-4503).

3 **Lalor, J. P.**, Wu, H., & Yu, H. (2019, November). Learning latent parameters without human response patterns: Item response theory with artificial crowds. In *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)* (pp. 4249-4259).
Also presented at the *2019 Workshop on Shortcomings in Vision and Language (SiVL)*.

2 **Lalor, J. P.**, Wu, H., Munkhdalai, T., & Yu, H. (2018). Understanding deep learning performance through an examination of test set difficulty: A psychometric case study. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing* (pp. 4711-4716).

1 **Lalor, J. P.**, Wu, H., & Yu, H. (2016, November). Building an evaluation scale using item response theory. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing* (pp. 648-657).

Additional Peer-Reviewed Conference and Workshop Proceedings

28 Chen, S., **Lalor, J. P.**, Yang, Y., & Abbasi, A. (2025, July). PersonaTwin: A multi-tier prompt conditioning framework for generating and evaluating personalized digital twins. In *Proceedings of the Fourth Workshop on Generation, Evaluation and Metrics (GEM^2)* (pp. 774-788).

27 Oketch, K., **Lalor, J. P.**, & Abbasi, A. (2025). Cultural artifacts, tribal heterogeneity, and language models. In *the 46th AIS International Conference on Information Systems (ICIS)*.
Also presented at the *2025 Workshop on Information Technology and Systems (WITS)*.

26 Oketch, K., **Lalor, J. P.**, Yang, Y., & Abbasi, A. (2025). Bridging the LLM accessibility divide? Performance, fairness, and cost of closed versus open llms for automated essay scoring. In *Proceedings of the Fourth Workshop on Generation, Evaluation and Metrics (GEM^2)*, (pp. 655-669).

25 Prat, N., *Lalor, J. P.*, & Abbasi, A. (2025, May). GALEA-Leveraging generative agents in artifact evaluation. In *International Conference on Design Science Research in Information Systems and Technology* (pp. 83-98).

24 Yang, Y., Duan, H., Abbasi, A., *Lalor, J. P.*, & Tam, K. Y. (2025, May). Bias a-head? Analyzing bias in transformer-based language model attention heads. In *Proceedings of the 5th Workshop on Trustworthy NLP (TrustNLP 2025)* (pp. 276-290).

23 **Lalor, J. P.**, Somanchi, S., Nwanganga, F., D'Arcy, J., & Angst, C. M. (2024). It's not what you say, it's how you say it: Investigating GDPR enforcement variation in the EU. In *Academy of Management Proceedings* (Vol. 2024, No. 1, p. 17252).
Also presented at the *Twentieth Symposium on Statistical Challenges in Electronic Commerce Research (SCECR)*.

22 **Lalor, J. P.**, Rodriguez, P., Sedoc, J., & Hernandez-Orallo, J. (2024, March). Item response theory for natural language processing. In *Proceedings of the 18th Conference of the European Chapter of the Association for Computational Linguistics: Tutorial Abstracts* (pp. 9-13).

21 Li, W., Chen, Y., Zheng, S., Wang, L., & **Lalor, J. P**. (2024, March). Stars are all you need: A distantly supervised pyramid network for unified sentiment analysis. In *Proceedings of the Ninth Workshop on Noisy and User-generated Text (W-NUT 2024)* (pp. 104-118).

20 Duan, X., & **Lalor, J. P**. (2023). H-COAL: Human correction of AI-generated labels for biomedical named entity recognition. In *Conference on Information Systems and Technology*.

Publications (continued)

19 **Lalor, J. P**. (2023). Ranking pull requests in open source software. In *Academy of Management Proceedings* (Vol. 2023, No. 1, p. 12665).

18 **Lalor, J. P**. (2022) On-the-fly difficulty estimation for deep neural networks. In *2022 INFORMS Annual Meeting*.

17 Rodriguez, P., Htut, P. M., **Lalor, J. P.**, & Sedoc, J. (2022, May). Clustering examples in multi-dataset benchmarks with item response theory. In *Proceedings of the Third Workshop on Insights from Negative Results in NLP* (pp. 100-112).

16 Berente, N., **Lalor, J. P.**, Somanchi, S., & Abbasi, A. (2021). The illusion of certainty and data-driven decision making in emergent situations. In *AIS International Conference on Information Systems (ICIS)*.

15 Safadi, H., **Lalor, J. P.**, & Berente, N. (2021). The effect of bots on human interaction in online communities. In *AIS International Conference on Information Systems (ICIS)*.
Best Theory Paper Award
Also presented at the *2020 INSNA Sunbelt Conference*.

14 **Lalor, J. P.**, & Guo, H. (2021) Measuring algorithmic interpretability. In *2021 INFORMS Annual Meeting*.
Also presented at the *2020 INFORMS Workshop on Data Science*.

13 **Lalor, J. P.**, Hu, W., Tran, M., Mazor, K., & Yu, H. (2021) Does defining medical jargon in a community hospital setting improve comprehension? In *2021 INFORMS Healthcare Conference*.

12 **Lalor, J. P.**, & Yu, H. (2020, November). Dynamic data selection for curriculum learning via ability estimation. In *Findings of the Association for Computational Linguistics: EMNLP 2020* (pp. 545-555).

11 Ma, M. C., & **Lalor, J. P.** (2020, November). An empirical analysis of human-bot interaction on reddit. In *Proceedings of the Sixth Workshop on Noisy User-generated Text (w-NUT 2020)* (pp. 101-106).

10 Cho, E., Xie, H., **Lalor, J. P.**, Kumar, V., & Campbell, W. M. (2019, December). Efficient semi-supervised learning for natural language understanding by optimizing diversity. In *2019 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)* (pp. 1077-1084). IEEE.

9 **Lalor, J. P.**, Wu, H., & Yu, H. (2019). Comparing human and DNN-ensemble response patterns for item response theory model fitting. In *the 2019 Workshop on Cognitive Modeling and Computational Linguistics*.

8 **Lalor, J. P.**, Wu, H., & Yu, H. (2018). Modeling difficulty to understand deep learning performance. In *the 2018 Northern Lights Deep Learning Workshop (NLDL)*.

7 **Lalor, J. P.**, Wu, H., & Yu, H. (2018). Soft label memorization-generalization for natural language inference. In *2018 UAI Workshop on Uncertainty in Deep Learning*.

6 **Lalor, J. P.**, Wu, H., & Yu, H. (2017). CIFT: Crowd-informed fine-tuning to improve machine learning ability. In *Human Computation and Crowdsourcing (HCOMP)*.

5 Munkhdalai, T., **Lalor, J. P.**, & Yu, H. (2016, November). Citation analysis with neural attention models. In **Proceedings of the Seventh International Workshop on Health Text Mining and Information Analysis** (pp. 69-77).

4 Miller, C. S., Settle, A., & **Lalor, J. P.** (2015, September). Learning object-oriented programming in python: Towards an inventory of difficulties and testing pitfalls. In *Proceedings of the 16th annual conference on information technology education* (pp. 59-64).

3 Settle, A., **Lalor, J. P.**, & Steinbach, T. (2015, September). Evaluating a linked-courses learning community for development majors. In *Proceedings of the 16th annual conference on information technology education* (pp. 127-132).

2 Settle, A., **Lalor, J. P.**, & Steinbach, T. (2015, June). A computer science linked-courses learning community. In *Proceedings of the 2015 ACM Conference on Innovation and Technology in Computer Science Education* (pp. 123-128).

1 Settle, A., **Lalor, J. P.**, & Steinbach, T. (2015, February). Reconsidering the impact of CS1 on novice attitudes. In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education* (pp. 229-234).

Research Projects

Under Review/Revision

5 Mohlmann, M., **Lalor, J. P.**, Son, Y., & Berente, N. Inflation in reputation systems? Newcomers, veterans, and socialization into a platform context.
Under review (5th round) at *Information Systems Research*.

4 Zheng, S., **Lalor, J. P.**, & Chen, Y. Diversifying recommendations on digital platforms: A dynamic graph neural network approach.
Major revision (after 1st round) at *Management Science*.

Research Projects (continued)

3 **Lalor, J. P.**, Kanuri, V., & Chakraborty, I. FEWD: A fused explainable model using wide and deep networks for synthesizing multi-modal content.
Under review (1st round) at *Production and Operations Management*.

2 Li, S., **Lalor, J. P.**, Ahmad, F., Abbasi, A., & Chawla, N. Modeling edge-rich graphs using neural networks.
Under review (1st round) at *IEEE Transactions on Knowledge and Data Engineering*.

1 Pothugunta, K., & **Lalor, J. P.** When AI learns to care: Cross-cultural variation in artificial compassion.
Under review (1st round) at *Information Systems Research* Special Issue on Compassionate AI.

Working Papers

8 **Lalor, J. P.**, Joshi, M., Angst, C. M., D'Arcy, J., & Nwanganga, F. When uniform regulation meets local realities: A theory of distributed regulatory decoupling in the case of GDPR.

7 **Lalor, J. P.**, Guo, H., Recker, J., Berente, N., & Abbasi, A. Measuring algorithmic interpretability: A human-learning-based framework and corresponding cognitive complexity score.

6 Costello, J., Chen, Y., **Lalor, J. P.**, & Guo, R. Rate before you write: How the presence and positioning of multidimensional attribute ratings influence attrition in online reviews.

5 **Lalor, J. P.**, & Qu, X. On the production and spread of news in a digital age.

4 Cook, R., **Lalor, J. P.**, & Abbasi, A. CADE: Classification with automatic difficulty estimation.

3 Oketch, K., **Lalor, J. P.**, & Abbasi, A. Is linguistic variation signal or noise? A taxonomy-guided evaluation of sociolinguistic diversity in Swahili NLP.

2 **Lalor, J. P.**, & Just, R. Ranking pull requests in open source software.

1 Lim, J. H., Kwon, S., Yao, Z., **Lalor, J. P.**, & Yu, H. Large language model-based role-playing for personalized medical jargon extraction. URL: https://arxiv.org/abs/2408.05555

Tutorials and Talks

11/2024 Should Fairness be a Metric or a Model? New Perspectives on Fairness. *University of Amsterdam*, invited talk.

05/2024 AI and Ethics: Growing the Good in Business, *Notre Dame Tech Forum*, invited panelist

03/2022 UT Austin PhD Seminar, invited lecturer
Item Response Theory for Natural Language Processing, Notre Dame NL+ seminar

10/2020 Dynamic Data Selection for Curriculum Learning via Ability Estimation. *Notre Dame Data, Inference, Analysis, and Learning Lab.*

09/2019 Learning Latent Parameters Without Human Response Patterns: Item Response Theory with Artificial Crowds. *Notre Dame Department of Computer Science and Engineering Seminar Series.*

11/2018 Evaluation and Interpretability in Deep Neural Networks. *American Medical Informatics Association (AMIA) Annual Symposium* Instructional Workshop, 2018. With A. Jagannatha and H. Yu.

09/2018 Leveraging Uncertainty for Better DNN Training and Evaluation. *UMass Lowell Data Science Lecture Series.*

09/2017 Building Better Evaluations using Item Response Theory. *University of Notre Dame Natural Language Processing Group.*

12/2016 Building Evaluation Scales for NLP using Item Response Theory. *UMass CICS Machine Learning and Friends Lunch series.*

Teaching

University of Notre Dame

2022- **ITAO 80810**: Machine Learning and Natural Language Processing
PhD students in Business Analytics
MSSA 60230: Data Analysis with Python
Masters-level students

2019- **ITAO 40250**: Unstructured Data Analytics
Advanced undergraduate students

Teaching (continued)

2019-2022 **ITAO 70810**: Data Wrangling with R
Masters-level students

University of Massachusetts Amherst

Fall 2018 UMass Lowell Data Science Lecture Series University of Massachusetts Lowell
CICS First Year Seminar University of Massachusetts Amherst
2015 Introduction to Computer Science, Amherst College Amherst, MA
Teaching Assistant

Advising

Thesis Committee Member

current Xiaojing Duan, PhD, Computer Science, University of Notre Dame
2022 Phu Mon Htut, PhD, Computer Science, New York University
2021 Pedro Rodriguez, PhD, Computer Science, University of Maryland College Park

Research Supervisor

2024-2025 Sarah Deussing, MS, Business Analytics
2023-2024 Guangyu Meng, PhD, Computer Science
2021-2023 Yu Chu Huang, MS, Business Analytics
Kaitlin Ryan, MS, Business Analytics
2021 Aiden McFadden, BBA, Business Analytics
2020-2021 Keagan McLaughlin, BBA, Business Analytics
2019 Vincent Buono, BBA, Business Analytics
2019-2020 Ming-Cheng Ma, MS, Business Analytics
2018 Long Le, BS, Computer Science
2017-2018 Nikhil Titus, MS, Computer Science

Other Advising

2018 UMass CICS Industry Mentor Program Research Mentor
2014 - 2015 DePaul University Computer Science Tutor

Media Coverage

08/06/2025 "GPs are using artificial intelligence to record patient consultations but how safe is your personal data?" https://www.abc.net.au/news/2025-08-06/doctor-ai-artificial-intelligence-scribe-notes-appointment/105615244

Spring 2025 "Bots increase online user engagement but stifle meaningful discussion, study shows." https://news.nd.edu/news/bots-increase-online-user-engagement-but-stifle-meaningful-discussion-study-shows/
" Helper bots in online communities diminish human interaction." https://theconversation.com/helper-bots-in-online-communities-diminish-human-interaction-251795

Spring 2023 "Research - Single-Sourcing is Better Patient Care." https://bizmagazine.nd.edu/issues/2023/spring-2023/research-single-sourcing-is-better-patient-care/

07/20/2021 Mendoza News, "Artificial intelligence tool could increase patient health literacy, study shows." https://mendoza.nd.edu/news/ai-tool-increases-health-literacy/

02/20/2019 VA Research News Briefs, "Educational tool helps patient understand electronic health records." https://www.research.va.gov/in_brief.cfm

Media Coverage (continued)

04/11/2017 NYU Center for Data Science, "Can deep learning models learn like the human brain?" https://cds.nyu.edu/machine-learning-intelligence/

Service

Program Committees

2023 Area Editor
ACL, ICIS
2022 Session Chair
INFORMS Annual Meeting
Senior Program Committee
SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)

Conference Reviewing

ACL Rolling Review (ARR), Workshop on Insights from Negative Results in NLP, ACL Workshop on Representation Learning for NLP (RepL4NLP), Pacific Asia Conference on Information Systems (PACIS), Workshop on Dynamic Adversarial Data Collection (DADC) North American Chapter of the Association of Computational Linguistics (NAACL), International Conference on Information Systems (ICIS), Association of Computational Linguistics (ACL), International Conference on Design Science Research in Information Systems and Technology (DESRIST) Empirical Methods in Natural Language Processing (EMNLP), American Medical Informatics Association (AMIA), Asia-Pacific Chapter of the Association for Computational Linguistics (AACL) The SIGNLL Conference on Computational Natural Language Learning (CoNLL)

Journals I've Reviewed For

MIS Quarterly, Information Systems Research (ISR), Managment Science, IEEE Intelligent Systems, Journal of the Association for Information Systems (JAIS), American Journal of Preventative Medicine (AJPM), Journal of Medical Internet Research (JMIR), Journal of the American Medical Informatics Association (JAMIA)

Additional Service

2020 - Co-organizer Notre Dame NL+ Natural Language Processing Lunch Seminar.
2018 - 2019 Co-organizer UMass CICS Machine Learning and Friends Lunch.
2014 - 2015 Graduate Ambassador DePaul University

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