John P. Lalor

University of Notre Dame – 338B Mendoza College of Business
Notre Dame, IN 46556

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Education

University of Massachusetts Amherst
Ph.D. Computer Science, Amherst, MA *2020*
Thesis: Learning Latent Characteristics of Data and Models using Item Response Theory
Advisor: Dr. Hong Yu

DePaul University
M.S. Computer Science, Chicago, IL *2015*

University of Notre Dame
B.B.A. IT Management, South Bend, IN *2011*
Minor: Irish Language and Literature

Professional Experience

Indiana University
Adjunct Assistant Professor, South Bend, IN *2022 -*
Department of Medicine, IU School of Medicine South Bend

University of Notre Dame
Assistant Professor, Notre Dame, IN *2020 -*
IT, Analytics, and Operations Department, Mendoza College of Business,
Computer Science and Engineering Department (concurrent), College of Engineering

Instructor, Notre Dame, IN *2019*
IT, Analytics, and Operations Department
Mendoza College of Business

Amazon Alexa
Applied Scientist Intern, Cambridge, MA *2017, 2018*

ESPN Advanced Technology Group
Intern, Bristol, CT *2016*

Eze Software Group
Software Developer, Chicago, IL *2013 - 2015*

KPMG
Advisory Associate, Chicago, IL *2011 - 2013*

Honors and Awards

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.

Journal Publications

[1] **John P Lalor**, Hao Wu, Kathleen Mazor, and Hong Yu. "Evaluating the Efficacy of NoteAid on EHR Note Comprehension among US Veterans through Amazon Mechanical Turk." In: *International Journal of Medical Informatics* (2023).
Forthcoming

[2] Kaitlin D Wowak, **John P Lalor**, Sriram Somanchi, and Corey Angst. "Business Analytics in Healthcare: Past, Present, and Future Trends." In: *Manufacturing and Service Operations Management* (2023).
Forthcoming

[3] **John P Lalor** and Pedro Rodriguez. "Py-Irt: A Scalable Item Response Theory Library for Python." In: *INFORMS Journal on Computing* (2022).

[4] **John P Lalor**, Wen Hu, Matthew Tran, Hao Wu, Kathleen M Mazor, and Hong Yu. "Evaluating the Effectiveness of NoteAid in a Community Hospital Setting: Randomized Trial of Electronic Health Record Note Comprehension Interventions With Patients." In: *Journal of Medical Internet Research* 23.5 (2021), e26354.

[5] Jinying Chen, **John P Lalor**, Weisong Liu, Emily Druhl, Edgard Granillo, Varsha G Vimalananda, and Hong Yu. "Detecting Hypoglycemia Incidents Reported in Patients' Secure Messages: Using Cost-Sensitive Learning and Oversampling to Reduce Data Imbalance." In: *Journal of Medical Internet Research* 21.3 (2019).

[6] **John P Lalor**, Beverly Woolf, and Hong Yu. "Improving Electronic Health Record Note Comprehension with Noteaid: Randomized Trial of Electronic Health Record Note Comprehension Interventions with Crowdsourced Workers." In: *Journal of Medical Internet Research* 21.1 (2019), e10793.

[7] **John P Lalor**, Hao Wu, Li Chen, Kathleen M Mazor, and Hong Yu. "ComprehENotes, an Instrument to Assess Patient Reading Comprehension of Electronic Health Record Notes: Development and Validation." In: *Journal of Medical Internet Research* 20.4 (2018), e9380.

Refereed Conference Proceedings

[1] **John P Lalor**, Yi Yang, Kendall Smith, Nicole Forsgren, and Ahmed Abbasi. "Benchmarking Intersectional Biases in NLP." In: *Proceedings of the 2022 Annual Conference of the North American Chapter of the Association for Computational Linguistics*. Association for Computational Linguistics, 2022.
Acceptance rate: 22%

[2] Ahmed Abbasi, David Dobolyi, **John P Lalor**, Richard G Netemeyer, Kendall Smith, and Yi Yang. "Constructing a Psychometric Testbed for Fair Natural Language Processing." In: *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing*. 2021, pp. 3748–3758.
Acceptance rate: 25.6%

[3] Pedro Rodriguez, Joe Barrow, Alexander Miserlis Hoyle, **John P Lalor**, Robin Jia, and Jordan Boyd-Graber. "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)*. 2021, pp. 4486–4503.
Acceptance rate: 21.2%

[4] **John P Lalor** and Hong Yu. "Dynamic data selection for curriculum learning via ability estimation." In: *Findings of the Association for Computational Linguistics: EMNLP 2020*. Vol. 2020. 2020, p. 545.
Acceptance rate: 37.4%

[5] **John P Lalor**, Hao Wu, and Hong Yu. "Learning latent parameters without human response patterns: Item response theory with artificial crowds." In: *Proceedings of the Conference on Empirical Methods in Natural Language Processing. Conference on Empirical Methods in Natural Language Processing*. Vol. 2019. 2019, p. 4240.
Acceptance rate: 23.4%

[6] **John P Lalor**, Hao Wu, Tsendsuren Munkhdalai, and Hong Yu. "Understanding deep learning performance through an examination of test set difficulty: A psychometric case study." In: *Proceedings of the Conference on Empirical Methods in Natural Language Processing. Conference on Empirical Methods in Natural Language Processing*. Vol. 2018. 2018, p. 4711.
Acceptance rate: 25.5%

[7] **John P Lalor**, Hao Wu, and Hong Yu. "Building an evaluation scale using item response theory." In: *Proceedings of the Conference on Empirical Methods in Natural Language Processing. Conference on Empirical Methods in Natural Language Processing*. Vol. 2016. 2016, p. 648.
Acceptance rate: 26%

[8] Craig Miller, Amber Settle, and **John Lalor**. "Learning Object-Oriented Programming in Python: Towards an Inventory of Difficulties and Testing Pitfalls." In: (2015).
Acceptance rate: 41%

[9] Amber Settle, **John Lalor**, and Theresa Steinbach. "A computer science linked-courses learning community." In: *Proceedings of the 2015 ACM Conference on Innovation and Technology in Computer Science Education*. 2015, pp. 123–128.
Acceptance rate: 34%

[10] Amber Settle, **John Lalor**, and Theresa Steinbach. "Evaluating a linked-courses learning community for development majors." In: *Proceedings of the 16th Annual Conference on Information Technology Education*. 2015, pp. 127–132.
Acceptance rate: 41%

[11] Amber Settle, **John Lalor**, and Theresa Steinbach. "Reconsidering the impact of CS1 on novice attitudes." In: *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*. 2015, pp. 229–234.
Acceptance rate: 36%

Other Presentations

[1] **John P Lalor**. *On-the-fly Difficulty Estimation for Deep Neural Networks*. 2022.
INFORMS Annual Meeting

[2] Nicholas Berente, **John P Lalor**, Sriram Somanchi, and Ahmed Abbasi. "The Illusion of Certainty and Data-Driven Decision Making in Emergent Situations." In: *International Conference on Information Systems (ICIS)*. 2021.

[3] **John P Lalor** and Hong Guo. *Measuring Algorithmic Interpretability*. 2021.
INFORMS Annual Meeting

[4] **John P Lalor**, Wen Hu, Matthew Tran, Kathleen Mazor, and Hong Yu. *Does Defining Medical Jargon In A Community Hospital Setting Improve Comprehension?* 2021.

INFORMS Healthcare Conference

[5] Hani Safadi, **John P Lalor**, and Nicholas Berente. "The Effect of Bots on Human Interaction in Online Communities." In: *International Conference on Information Systems (ICIS)*. 2021.
Best theory paper award

[6] **John P Lalor**, Nicholas Berente, and Hani Safadi. *Bots versus humans in online social networks: a study of Reddit communities*. 2020.
INSNA Sunbelt Conference

[7] **John P Lalor** and Hong Guo. *Towards Measuring Algorithmic Interpretability*. 2020.
INFORMS Workshop on Data Science

[8] Michael Ma and **John P Lalor**. *An Empirical Analysis of Human-Bot Interaction on Reddit*. 2020.
Workshop on Noisy User-generated Text (W-NUT)

[9] Ming-Cheng Ma and **John P Lalor**. "An empirical analysis of human-bot interaction on reddit." In: *Proceedings of the Sixth Workshop on Noisy User-generated Text (W-NUT 2020)*. 2020, pp. 101–106.

[10] Eunah Cho, He Xie, **John P Lalor**, Varun Kumar, and William M Campbell. *Efficient Semi-Supervised Learning for Natural Language Understanding by Optimizing Diversity*. 2019.
ASRU 2019: the IEEE Automatic Speech Recognition and Understanding Workshop

[11] **John P Lalor**, Hao Wu, and Hong Yu. *Comparing Human and DNN-Ensemble Response Patterns for Item Response Theory Model Fitting*. 2019.
Workshop on Cognitive Modeling and Computational Linguistics (CMCL)

[12] **John P Lalor**, Hao Wu, and Hong Yu. *Learning Latent Parameters without Human Response Patterns: Item Response Theory with Artificial Crowds*. 2019.
Workshop on Shortcomings in Vision and Language (SiVL)

[13] Jinying Chen, **John P Lalor**, and Hong Yu. *Detecting Hypoglycemia Incidents from Patients' Secure Messages*. 2018.
American Medical Informatics Association (AMIA) Annual Symposium

[14] **John P Lalor**, Hao Wu, and Hong Yu. *Modeling Difficulty to Understand Deep Learning Performance*. 2018.
Northern Lights Deep Learning Workshop (NLDL)

[15] **John P Lalor**, Hao Wu, and Hong Yu. *Soft Label Memorization-Generalization for Natural Language Inference*. 2018.
UAI Workshop on Uncertainty in Deep Learning

[16] **John P Lalor**, Hao Wu, Li Chen, Kathleen Mazor, and Hong Yu. *Generating a Test of Electronic Health Record Narrative Comprehension with Item Response Theory*. 2017.
American Medical Informatics Association (AMIA) Annual Symposium

[17] **John P Lalor**, Hao Wu, and Hong Yu. *CIFT: Crowd-Informed Fine-Tuning to Improve Machine Learning Ability*. 2017.
Human Computation and Crowdsourcing (HCOMP), arXiv preprint arXiv:1702.08563

[18] Tsendsuren Munkhdalai, **John P Lalor**, and Hong Yu. *Citation Analysis with Neural Attention Models*. 2016.
Workshop on Health Text Mining and Information Analysis

Working Papers

[1] Duan, Yang, Abbasi, John P. Lalor, and Tam. *Bias Ahead? A Unified Bias Analysis Framework for Transformer-Based Language Models*.
Revise and resubmit (after 1st round) at TACL

[2] John P Lalor and Hong Guo. *Measuring Algorithmic Interpretability: A Human-Learning-Based Framework and the Corresponding Cognitive Complexity Score*.

[3] John P Lalor and Hong Yu. *Learning Difficulties for Curriculum Learning*.
Status: Reject and resubmit, Journal of Machine Learning Research

[4] Wenchang Li, Yixing Chen, Qiangming Yan, and John P. Lalor. *End-to-End Sentiment Analysis with a Distantly Supervised Pyramid Network*.
Status: Under review at ACL 2023

[5] Hani Safadi, John P Lalor, and Nicholas Berente. *The Effect of Bots on Human Interaction in Online Communities*.
Status: Major revision (after 2nd round) at MIS Quarterly

Research Support

2020-2021: PI. "Development and validation of a multidimensional mental health screening instrument." Atlantic Coast Conference Innovation Initiative. $5,500

2020-2021: Subaward recipient. "Resource Curation and Evaluation for EHR Note Comprehension." National Library of Medicine. $10,000

2020: PI. "Towards Automatic Generation of Electronic Health Record Note Comprehension Questions." Notre Dame Faculty Research Support Program - Initiation Grant. $10,000

Tutorials and Talks

03/2022: UT Austin PhD Seminar, invited lecturer

03/2022: 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, Mendoza College of Business

ITAO 80810: Machine Learning and Natural Language Processing
Instructor *2022-*
PhD students in Business Analytics

MSSA 60230: Data Analysis with Python
Instructor *2022-*
Masters-level students

ITAO 40250: Unstructured Data Analytics
Instructor *2019-2022*
Advanced undergraduate students

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

University of Massachusetts Amherst

UMass Lowell Data Science Lecture Series **University of Massachusetts Lowell**
Instructor *Fall 2018*

CICS First Year Seminar **University of Massachusetts Amherst**
Instructor *Fall 2018*

Introduction to Computer Science, Amherst College **Amherst, MA**
Teaching Assistant *2015*

Advising

Phu Mon Htut
PhD, Computer Science, New York University, thesis committee member *2022*

Yu Chu Huang
MS, Business Analytics, research supervisor *2021-2022*

Kaitlin Ryan
MS, Business Analytics, research supervisor *2021-2022*

Pedro Rodriguez
PhD, Computer Science, University of Maryland College Park, thesis committee member *2021*

Aiden McFadden
BBA, Business Analytics, research supervisor *2021*

Keagan McLaughlin
BBA, Business Analytics, research supervisor *2020-2021*

Vincent Buono
BBA, Business Analytics, research supervisor *2019*

Ming-Cheng Ma
MS, Business Analytics, research supervisor *2019-2020*

Long Le
BS, Computer Science, research supervisor *2018*

UMass CICS Industry Mentor Program
MS student group research mentor *2018*

Nikhil Titus
MS, Computer Science, research supervisor *2017-2018*

DePaul University
Computer Science Tutor *2014 - 2015*

Media Coverage

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`

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

Session Chair *2022*
2022 INFORMS Annual Meeting

Senior Program Committee *2022*
SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)

Reviewer *2022*
ACL Rolling Review (ARR), Rep4NLP, 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)

2021
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)

2020
International Conference on Information Systems (ICIS), Association of Computational Linguistics (ACL), Empirical Methods in Natural Language Processing (EMNLP), American Medical Informatics Association (AMIA), ACL Workshop on Representation Learning for NLP (RepL4NLP), Asia-Pacific Chapter of the Association for Computational Linguistics (AACL)

2019
North American Chapter of the Association of Computational Linguistics (NAACL), Association of Computational Linguistics (ACL), Empirical Methods in Natural Language Processing (EMNLP), American Medical Informatics Association (AMIA), The SIGNLL Conference on Computational Natural Language Learning (CoNLL)

Journals I've reviewed for

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

Additional service

UMass CICS Machine Learning and Friends Lunch.
Co-organizer *2018 - 2019*

DePaul University
Graduate Ambassador *2014 - 2015*

Last Updated: December 2022