

John P. Lalor

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Education

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

Professional Experience

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

Publications

Journal and Conference Papers

- 1 P. Rodriguez, J. Barrow, A.M. Hoyle, **J.P. Lalor**, R. Jia and J. Boyd-Graber. Rethinking NLP Leaderboards with Methods from Educational Testing. *The Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP 2021)* (forthcoming).
- 2 **J.P. Lalor**, W. Hu, M. Tran, H. Wu, K. Mazor, H. Yu. Evaluating the Effectiveness of NoteAid in a Community Hospital Setting: Randomized Control Trial. *J Med Internet Res* 23.5 (2021): e26354.
- 3 **J.P. Lalor**, H. Yu. Dynamic Data Selection for Curriculum Learning via Ability Estimation. *Findings of the Association for Computational Linguistics: EMNLP*, 2020.
Selected for presentation at the 2020 Conference on Computational Natural Language Learning (CoNLL).

- 4 **J.P. Lalor**, H. Wu, H. Yu. Learning Latent Parameters without Human Response Patterns: Item Response Theory with Artificial Crowds. *EMNLP-IJCNLP 2019: Conference on Empirical Methods in Natural Language Processing and International Joint Conference on Natural Language Processing*, 2019
- 5 J. Chen, **J.P. Lalor**, W. Liu, E. Druhl, H. Yu. Detecting Hypoglycemia Incidents Reported in Patients' Secure Messages: Using Cost-sensitive Learning and Oversampling to Reduce Data Imbalance. *J Med Internet Res* 2019;21(3):e11990. doi:10.2196/11990
- 6 **J.P. Lalor**, B. Woolf, H. Yu. Improving EHR Note Comprehension with NoteAid: A Randomized Trial of EHR Note Comprehension Interventions with Crowdsourced Workers. *J Med Internet Res* 2019;21(1):e10793. doi:10.2196/10793.
- 7 **J.P. Lalor**, H. Wu, T. Munkhdalai, H. Yu. Understanding Deep Learning Performance through an Examination of Test Set Difficulty: A Psychometric Case Study. *EMNLP 2018: Conference on Empirical Methods in Natural Language Processing*, 2018.
Oral presentation, top 10% of short papers
- 8 **J.P. Lalor**, H. Wu, L. Chen, K. Mazor, H. Yu. CompreHENotes, an Instrument for Assessing Patient Electronic Health Record Note Reading Comprehension: Development and Validation. *J Med Internet Res* 2018;20(4):e139. doi:10.2196/jmir.9380
- 9 **J.P. Lalor**, H. Wu, H. Yu. Building an Evaluation Scale using Item Response Theory. *EMNLP 2016: Conference on Empirical Methods in Natural Language Processing*, Austin, TX, USA, November 2016.
- 10 C. Miller, A. Settle, **J.P. Lalor**. Learning Object-Oriented Programming in Python: Towards an Inventory of Difficulties and Testing Pitfalls. *SIGITE 2015: The Special Interest Group for Information Technology Education Conference*, Chicago, IL, October 2015
- 11 A. Settle, **J.P. Lalor**, T. Steinbach. Evaluating a Linked-Courses Learning Community for Development Majors. *SIGITE 2015: The Special Interest Group for Information Technology Education Conference*, Chicago, IL, October 2015
- 12 A. Settle, **J.P. Lalor**, T. Steinbach. A Computer Science Linked-Courses Learning Community. *ITiCSE 2015: The 20th Annual Conference on Innovation and Technology in Computer Science Education*. Vilnius, Lithuania, July 2015
- 13 A. Settle, **J.P. Lalor**, T. Steinbach. Reconsidering the Impact of CS1 on Novice Attitudes. *SIGCSE 2015: The ACM Special Interest Group on Computer Science Education*. Kansas City, MO, March 2015

Workshop Papers, Presentations, and Abstracts

- 1 **J.P. Lalor**, H. Guo. Measuring Algorithmic Interpretability. *INFORMS Annual Meeting*. (forthcoming).
- 2 **J.P. Lalor**, W. Hu, M. Tran, H. Wu, K. Mazor, H. Yu. Does Defining Medical Jargon In A Community Hospital Setting Improve Comprehension? *2021 INFORMS Healthcare Conference*. (forthcoming).
- 3 M. Ma, **J.P. Lalor**. An Empirical Analysis of Human-Bot Interaction on Reddit. *Workshop on Noisy User-generated Text (W-NUT)*, 2020.
- 4 **J.P. Lalor**, H. Guo. Towards Measuring Algorithmic Interpretability. *INFORMS Workshop on Data Science*, 2020.

- 5 **J.P. Lalor**, H. Safadi, N. Berente. Bots versus Humans in Online Social Networks: A Study of Reddit Communities. *Sunbelt*, 2020.
- 6 E. Cho, H. Xie, **J.P. Lalor**, V. Kumar, W. M. Campbell. Efficient Semi-Supervised Learning for Natural Language Understanding by Optimizing Diversity. *ASRU 2019: the IEEE Automatic Speech Recognition and Understanding Workshop*, 2019.
- 7 **J.P. Lalor**, H. Wu, H. Yu. Learning Latent Parameters without Human Response Patterns: Item Response Theory with Artificial Crowds. *NAACL Workshop on Shortcomings in Vision and Language (SiVL)*, 2019.
- 8 **J.P. Lalor**, H. Wu, H. Yu. Comparing Human and DNN-Ensemble Response Patterns for Item Response Theory Model Fitting. *NAACL Workshop on Cognitive Modeling and Computational Linguistics (CMCL)*, 2019.
- 9 J. Chen, **J.P. Lalor**, H. Yu. Detecting Hypoglycemia Incidents from Patients' Secure Messages. *American Medical Informatics Association (AMIA) Annual Symposium*, 2018.
- 10 **J.P. Lalor**, H. Wu, H. Yu. Soft Label Memorization-Generalization for Natural Language Inference. *Workshop on Uncertainty in Deep Learning. Uncertainty in Artificial Intelligence (UAI)*, 2018.
- 11 **J.P. Lalor**, H. Wu, H. Yu. Modeling Difficulty to Understand Deep Learning Performance. *Northern Lights Deep Learning Workshop (NLDL)*, 2018.
- 12 **J.P. Lalor**, H. Wu, H. Yu. CIFT: Crowd-Informed Fine-Tuning to Improve Machine Learning Ability. *Human Computation and Crowdsourcing (HCOMP)*, 2017.
- 13 **J.P. Lalor**, H. Wu, L. Chen, K. Mazor, H. Yu. Generating a Test of Electronic Health Record Narrative Comprehension with Item Response Theory. *American Medical Informatics Association (AMIA) Annual Symposium*, 2017.
- 14 T. Munkhdalai, **J.P. Lalor**, H. Yu. Citation Analysis with Neural Attention Models. *LOUHI 2016 : The Seventh International Workshop on Health Text Mining and Information Analysis*, Austin, TX, USA, November 2016.

Manuscripts in Progress

- 1 A. Abbasi, D. Dobolyi, **J.P. Lalor**, R. Netemeyer, K. Smith, Y. Yang. Constructing a Psychometric Testbed for Fair Natural Language Processing.
Status: Under review. Authors listed alphabetically.
- 2 K.D. Wowak, **J.P. Lalor**, S. Somanchi, C. Angst. A Framework for Business Analytics in Healthcare.
Status: Major revision at *POM Special Issue on Business Analytics*.
- 3 **J.P. Lalor**, H. Yu. Learning Difficulties for Curriculum Learning.
Status: Reject and resubmit at *JMLR*.
- 4 N. Berente, **J.P. Lalor**, S. Somanchi, A. Abbasi. Overcoming the Illusion of Certainty: Resilience in Data-Driven Decision Making during Emergent Situations. Status: Under review at *ICIS*.
- 5 H. Safadi, **J.P. Lalor**, N. Berente. Bots versus Humans in Online Social Networks: A Study of Reddit Communities.
Status: Under review at *ICIS*.

- 6 **J.P. Lalor**, H. Guo. Measuring Algorithmic Interpretability.
Status: In preparation for submission to *Management Science*.
- 7 **J.P. Lalor**. Automatic Difficulty Estimation of Unseen Data.
Status: Data analysis/writing. Target: *JMLR*.
- 8 **J.P. Lalor**. Towards Automatic Clinical Question Generation for Personalized Health Literacy Assessment.
Status: Writing. Target: *ACM TMIS*.
- 9 **J.P. Lalor**, M. Barron, S. Berry, S. Nestler. Development and Validation of a Multidimensional Mental Health Screening Instrument for Student-Athletes.
Status: Student recruitment.

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

- 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

2019- **Instructor**, ITAO 40250: *Unstructured Data Analytics*, advanced undergraduate.

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

University of Massachusetts

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

- Fall 2018 **Instructor**, CICS First Year Seminar, University of Massachusetts Amherst.
 2015 **Teaching Assistant**, Introduction to Computer Science, Amherst College, Amherst, MA.

Advising

- 2021 **Pedro Rodriguez**, PhD, Computer Science, University of Maryland College Park, thesis committee member.
 2021 **Aiden McFadden**, BBA, Business Analytics, research supervisor.
 2020-2021 **Keagan McLaughlin**, BBA, Business Analytics, research supervisor.
 2019 **Vincent Buono**, BBA, Business Analytics, research supervisor.
 2019-2020 **Ming-Cheng Ma**, MS, Business Analytics, research supervisor.
 2018 **Long Le**, BS, Computer Science, research supervisor.
 2018 **UMass CICS Industry Mentor Program**, MS student group research mentor.
 2017-2018 **Nikhil Titus**, MS, Computer Science, research supervisor.
 2014 - 2015 **Tutor**, DePaul University.

Media Coverage

- 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

- 2021 **Reviewer**, 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 **Reviewer**, 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 **Reviewer**, 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), IEEE Intelligent Systems, American Journal of Preventative Medicine (AJPM), Journal of Medical Internet Research (JMIR), Journal of the American Medical Informatics Association (JAMIA)

Additional service

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

2014 - 2015 **Graduate Ambassador**, DePaul University.

■ Honors and Awards

2018 UMass CICS Travel Grant recipient

2015 Upsilon Pi Epsilon Computer Science Honor Society, DePaul chapter

2010, 2011 USA Rugby Midwest Select Side Selection

2008 USA Rugby Under-19s Selection

Last Updated: July 2021