

Maria Leonor Pacheco

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RESEARCH INTERESTS

Natural language processing, machine learning, artificial intelligence, computational social science, social computing.

ACADEMIC AND PROFESSIONAL APPOINTMENTS

Assistant Professor Computer Science, University of Colorado Boulder	2023 - Present
Visiting Assistant Professor Computer Science, University of Colorado Boulder	2022 - 2023
Postdoctoral Researcher Microsoft Research NYC	2022 - 2023
Software Engineer Predictvia, Caracas, Venezuela	2013 - 2015

EDUCATION

Ph.D., Computer Science Purdue University; Advisor: Dr. Dan Goldwasser	2015 — 2022
B.Sc., Computer Science and Engineering Universidad Simon Bolivar, Caracas, Venezuela; Advisor: Dr. Soraya Abad-Mota.	2007 — 2013
Visiting Student Researcher Nagaoka University of Technology, Niigata, Japan; Advisor: Dr. Takashi Yukawa.	2011 — 2012

PUBLICATIONS

Authors with names underlined are students I advised or mentored.

Peer-Reviewed Journal Publications

- [J1] **Pacheco, M.L.**, and Goldwasser, D. (2021) “Modeling Content and Context with Deep Relational Learning”. In *Transactions of the Association for Computational Linguistics (ACL)*, 9, 100–119.

Peer-Reviewed Conference Publications

- [C12] **Pacheco, M.L.**, Islam, T., Ungar, L., Yin, M., and Goldwasser, D. (2023) “Interactive Concept Learning for Uncovering Latent Themes in Large Text Collections.”. In *Findings of the Association for Computational Linguistics: ACL 2023*. pp. 5059–5080.
- [C11] QueerInAI, O. O., et al. (2023) “. Queer in AI: A case study in community-led participatory AI.”. In *Proceedings of the 2023 ACM Conference on Fairness, Accountability, and Transparency (FAccT)*. pp. 1882–1895.
- [C10] **Pacheco, M.L.**, Roy, S., and Goldwasser, D. (2022). “Hands-on interactive neuro-symbolic NLP with DRaiL”. In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing, EMNLP: System Demonstrations*. pp. 371–378.
- [C9] **Pacheco, M.L.**, Islam, T., Mahajan, M., Shor, A., Yin, M., Ungar, L., and Goldwasser, D. (2022). “A Holistic Framework for Analyzing the COVID-19 Vaccine Debate”. In *Proceedings of the 2022 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL)*. pp. 5821–5839.
- [C8] Mehta, N., **Pacheco, M.L.**, and Goldwasser, D. (2022). “Tackling Fake News Detection by Continually Improving Social Context Representations using Graph Neural Networks. In *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (ACL)*. pp. 1363–1380.
- [C7] **Pacheco, M.L.**, von Hippel, M., Weintraub, B., Goldwasser, D., and Nita-Rotaru, C. (2022). “Automated Attack Synthesis by Extracting Finite State Machines from Protocol Specification Documents. In *43rd IEEE Symposium on Security and Privacy (S&P Oakland)*.

- [C6] Roy, S., **Pacheco, M.L.**, and Goldwasser, D. (2021). “Identifying Morality Frames in Political Tweets using Relational Learning”. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. pp. 9939–9958.
- [C5] Lee, I.-T., **Pacheco, M.L.**, and Goldwasser, D. (2021). “Modeling Human Mental States with an Entity-based Narrative Graph”. In *Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL)*. pp. 4916–4926.
- [C4] Widmoser, M., **Pacheco, M.L.**, Honorio, J., and Goldwasser, D. (2021). “Randomized Deep Structured Prediction for Discourse-level Processing”. In *Proceedings of the 16th Conference of the European Chapter of the Association for Computational Linguistics: Main volume (EACL)*. pp. 1174–1184.
- [C3] Lee, I.-T., **Pacheco, M.L.**, and Goldwasser, D. (2020). “Weakly-Supervised Modeling of Contextualized Event Embedding for Discourse Relations”. In *Findings of the Association for Computational Linguistics: EMNLP 2020*. pp. 4962–4972.
- [C2] Jain, A., **Pacheco, M.L.**, Lancette, S., Goindani, M., and Goldwasser, D. (2020). “Identifying Collaborative Conversations using Latent Discourse Behaviors”. In *Proceedings of the 21th annual meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL)*. pp. 74–78.
- [C1] Jero, S., **Pacheco, M.L.**, Goldwasser, D., and Nita-Rotaru, C. (2019). “Leveraging Textual Specifications for Grammar-Based Fuzzing of Network Protocols”. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*. Vol. 33, pp. 9478–9483.

Peer-Reviewed Workshop and Shared Task Publications

- [W5] Srinivas, D., Das, R., Tizpaz-Niari, S., Trivedi, A., and **Pacheco, M.L.** (2023). “On the Potential and Limitations of Few-Shot In-Context Learning to Generate Metamorphic Specifications for Tax Preparation Software”. In *Proceedings of the Fifth Workshop on Natural Legal Language Processing*. pp. 230–243.
- [W4] **Pacheco, M.L.**, Islam, T., Ungar, L., Yin, M., and Goldwasser, D. (2022). “Interactively Uncovering Latent Arguments in Social Media Platforms: A Case Study on the Covid-19 Vaccine Debate”. In *Proceedings of the Fourth Workshop on Data Science with Human-in-the-Loop (Language Advances)*. pp. 94–111.
- [W3] Lee, I.-T., Goindani, M., Li, C., Jin, D., Johnson, K.M., Zhang, X., **Pacheco, M.L.** and Goldwasser, D. (2017). “PurdueNLP at SemEval-2017 Task 1: Predicting Semantic Textual Similarity with Paraphrase and Event Embeddings”. In *Proceedings of the 11th international workshop on Semantic Evaluation (SemEval)*. pp. 198–202.
- [W2] Zhang, X., **Pacheco, M.L.**, Li, C., and Goldwasser, D. (2016). “Introducing DRAIL – A Step towards Declarative Deep Relational Learning”. In *Proceedings of the workshop on Structured Prediction for NLP*. pp. 54–62.
- [W1] **Pacheco, M.L.**, Lee, I.-T., Zhang, X., Zehady, A.K., Daga, P., Jin, D., Parolia, A., and Goldwasser, D. (2016). “Adapting Event Embedding for Implicit Discourse Relation Recognition”. In *Proceedings of the CoNLL-16 Shared Task*. pp. 136–142.

Peer-Reviewed Workshop and Conference Papers/Abstracts without Published Proceedings

- [P7] Chandra, A., Das, R., Fang, C.-H., Lee, I.-T., and **Pacheco, M.L.** (2023). “A Narrative Graph Approach for Analyzing Framing in News Articles”. *New Directions in Analyzing Text as Data*. Abstract.
- [P6] Leto, A., Pickens, E., Needell, C., Rothschild, D., and **Pacheco, M.L.** (2023). “A Computational Model of Selection and Framing in News about the U.S. Economy”. *New Directions in Analyzing Text as Data*. Abstract.
- [P5] **Pacheco, M.L.**, Islam, T., Ungar, L., Yin, M., and Goldwasser, D. (2022). “An Interactive Framework for Identifying Latent Themes in Large Text Collections”. *NeurIPS 2022 Workshop on Interactive Learning for Natural Language Processing*. 5-Page Paper.
- [P4] **Pacheco, M.L.**, Islam, T., Ungar, L., Yin, M., and Goldwasser, D. (2022). “An Interactive Framework for Identifying Latent Themes in Large Text Collections”. *LatinX in AI Workshop at NeurIPS 2022*. 5-Page Paper.
- [P3] **Pacheco, M.L.** and Goldwasser, D. (2020). “Neural-Symbolic Modeling for Natural Language Discourse”. *ICML 2020 Workshop on Bridge Between Perception and Reasoning*. 4-Page Paper.
- [P2] Widmoser, M., **Pacheco, M.L.**, Honorio, J., and Goldwasser, D. (2020). Randomized Deep Structured Prediction for Argumentation Mining. *EMNLP 2020 Workshop on Structured Prediction for NLP*. 8-Page Paper.
- [P1] **Pacheco, M.L.**, Dalal, I., and Goldwasser, D. (2018). “Leveraging Representation and Inference through Deep Relational Learning”. *NeurIPS 2018 Workshop on Relational Representation Learning*. 4-Page Paper.

Dissertation and Thesis

- [D2] **Pacheco, M.L.** “Neural-Symbolic Modeling for Natural Language Discourse”. *Ph.D. Dissertation*. Department of Computer Science, Purdue University. April 2022.
- [D1] **Pacheco, M.L.** “Information Extraction from Twitter During Mass Emergency Situations”. *Honors Thesis*. Departamento de Computacion y Tecnologia de la Informacion, Universidad Simon Bolivar. July 2013.

INVITED TALKS, TUTORIALS AND KEYNOTES

Excludes conference/workshop publication presentations.

- [T15] “From Topic Models to Concept Models: Facilitating Expert-in-the-Loop Interaction with Neuro-Symbolic Representation”. Invited talk at the University of Massachusetts Amherst. (Oct 24, 2023).
- [T14] “An Overview of Neuro-Symbolic Strategies for NLP and Computational Social Science”. Invited talk at the 1st EU-UK HYBRIDS Meeting at the Universidad de Santiago de Compostela, Spain. (Sep. 20, 2023).
- [T13] “Natural Language Processing in the Era of Chat-GPT”. Invited talk at the CELEHS and Harvard Medical School Data Science Summer Program. (Jul. 13, 2023).
- [T12] “Neuro-Symbolic Discourse Processing”. Invited talk at the Universidad de Puerto Rico Mayaguez. (Nov. 3, 2022).
- [T11] “NS4NLP: Neuro-Symbolic Methods for NLP (extended version)”. Tutorial at the 29th International Conference in Computational Linguistics, COLING 2022. (Oct. 17, 2021). Taught with Sean Welleck, Dan Goldwasser, Vivek Srikumar, Yejin Choi and Dan Roth.
- [T10] “Neural-Symbolic Modeling for NLP”. Keynote at the LatinX in NLP Workshop, NAACL 2022. (Jul. 10, 2022).
- [T9] “Automated Attack Synthesis by Extracting Finite State Machines from Protocol Specification Documents”. Invited talk at Trail of Bits. (Apr. 26, 2022). Co-presented with Max von Hippel.
- [T8] “Automated Attack Synthesis by Extracting Finite State Machines from Protocol Specification Documents”. Invited talk at MIT CSAIL. (Apr. 6, 2022). Co-presented with Max von Hippel.
- [T7] “Automated Attack Synthesis by Extracting Finite State Machines from Protocol Specification Documents”. Invited talk at Microsoft Research Redmond. (Mar. 18, 2022)
- [T6] “Reasoning About Entities and Events with Narrative Graphs”. Invited talk at the University of North Carolina at Chapel Hill. (Oct. 2, 2021).
- [T5] “NS4NLP: Neural-Symbolic Modeling for NLP”. Tutorial at the 30th International Joint Conference on Artificial Intelligence, IJCAI 2021. (Aug. 20, 2021). Taught with Dan Goldwasser.
- [T4] “Modeling Content and Context with Deep Relational Learning”. Invited talk at Microsoft Research Redmond. (Jun. 17, 2021).
- [T3] “Modeling Content and Context with Deep Relational Learning”. Invited talks at the Boston Computation Club. (Jun. 13, 2021).
- [T2] “Modeling Content and Context with Deep Relational Learning”. Invited talks at the Orlando Machine Learning and Data Science Meetup. (Mar. 20, 2021).
- [T1] “Event Embeddings for Implicit Discourse Relations”. Invited talk at the Universidad Simon Bolivar, Caracas, Venezuela. (May 17, 2016).

FUNDING

Research

Microsoft Research Dissertation Grant 2021
Neural-Symbolic Modeling for Natural Language Discourse
Amount: \$25,000

Teaching

Google Cloud Education Grant Fall 2023
Amount: \$1,500

AWARDS AND SCHOLARSHIPS

Best Presenter Award.

LatinX in AI Workshop at NeurIPs 2022

Teaching Academy Graduate Teaching Award.

Selected by the Computer Science Department at Purdue University in 2017.

JASSO Student Exchange Support Program.

Scholarship for short-term study in Japan in the 2011-2012 academic year.

TEACHING

Course: Natural Language Processing	Spring 2024
Audience: Graduate students at the University of Colorado Boulder	
Role: Instructor	
Course: Neuro-Symbolic Methods for Natural Language Processing	Fall 2023
Audience: Graduate students at the University of Colorado Boulder	
Role: Instructor	
Problem Solving and Object Oriented Programming	Fall 2015, Spring 2016, Summer 2016, Fall 2016
Audience: Undergraduate students at Purdue University	
Role: Graduate student instructor	

ADVISING AND MENTORING

Doctoral Students, Advisor

Rohan Das	Spring 2024 - Present
Alexandria Leto	Fall 2023 - Present
Dananjay Srinivas	Fall 2023 - Present
Juan Vasquez (Co-advised with Alexis Palmer)	Fall 2023 - Present
Aaron Gluck (Co-advised with Katharina von der Wense)	Fall 2023 - Present

Master Students, Advisor

Matt Pauk	Spring 2024 - Present
Denzil Ekow-Bilson	Fall 2023 - Present

Doctoral Students, Committee Member

Adam Wiemerslage	Fall 2023 - Present
Elizabeth Spaulding	Fall 2023 - Present
Kristen Schneider	Fall 2023 - Present

Independent Study Advisor

Christopher Ebuka Ojukwu (Ph.D. student)	Spring 2024
Aditya Chandra (Master student)	Fall 2023, Spring 2024
Rohan Das (Master student)	Fall 2023

PROFESSIONAL SERVICE

Conference Organizing

NAACL, Diversity and Inclusion Chair	2024
SIGDIAL, Social Media Chair	2021

Workshop Organizing

ACL, Queer in AI Workshop	2023
NAACL, LatinX in AI Workshop	2022
NAACL, Queer in AI Workshop	2022
NAACL, Student Research Workshop	2022

Area Chair / Senior PC

AAAI, Senior PC Member (Meta-reviewer)	2023, 2024
ACL, Area Chair, NLP Applications Track	2023

Program Committee / Reviewer

ACL Rolling Review: An initiative of the Association for Computational Linguistics	2021 - Present
AAAI: Association for the Advancement of Artificial Intelligence	2021, 2022
EMNLP: Empirical Methods in Natural Language Processing	2021, 2022
NAACL: North American Chapter of the Association for Computational Linguistics	2021
ACL: Association for Computational Linguistics	2021
ACM Computing Surveys	2020-2021

Departmental Service

NLP Faculty Search Committee, University of Colorado Boulder	2023 - Present
Diversity, Equity and Inclusion Committee, Purdue University	2020 - 2022
Diversity Chair of Computer Science Graduate Student Board, Purdue University	2020 - 2022

University Service

Leadership Team of Women in Science Programs, Purdue University	2021 - 2022
Global Ambassador of Graduate School, Purdue University	2018 - 2022

Other

National Science Foundation (NSF) Reviewer	2024
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