

Jorge A. Méndez

Curriculum Vitae

Massachusetts Institute of Technology
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RESEARCH INTERESTS

My primary research interest is the creation of versatile artificially intelligent systems that learn to accumulate knowledge over their lifetimes. I focus on the question of how agents can decompose the complex knowledge required to model a lifelong data stream into simpler units that can be adapted and reused in the future. My work applies these methods to computer vision, robotics, and natural language.

EDUCATION

- May 2022 **Ph.D. in computer and information science**, *University of Pennsylvania*
Thesis: “Lifelong machine learning of functionally compositional structures.”
Advisor: Eric Eaton. Committee: Dan Roth (chair), Pratik Chaudhari, Kostas Daniilidis, and George Konidakis (Brown University).
- August 2018 **M.S.E. in robotics**, *University of Pennsylvania*
- April 2016 **B.S. *summa cum laude* in electronics engineering (*Ingeniero electrónico*)**, *Universidad Simón Bolívar*, Venezuela
Thesis: “Implementation of algorithms and debugging for STMicroelectronics wearable platform” (*Desarrollo de algoritmos y depuración de la plataforma ponible de STMicroelectronics*).
[Awarded “Exceptionally Good” distinction]
Advisors: Daniele Caltabiano (STMicroelectronics), Giacomo Boracchi (Politecnico di Milano), Novel Certad (Universidad Simón Bolívar).
- 2014–2015 **Exchange graduate student in computer science**, *Politecnico di Milano*, Italy

RESEARCH APPOINTMENTS

Massachusetts Institute of Technology

Sep. 2022–Present *Postdoctoral Fellow* with Tomás Lozano-Pérez and Leslie Pack Kaelbling

University of Pennsylvania

May 2022–Aug. 2022 *Postdoctoral Researcher* with Eric Eaton

2016–2022 *Research Assistant* with Eric Eaton

Facebook AI Research

Jun. 2021–Sep. 2021 *Research Intern* with Arthur Szlam and Ludovic Denoyer

Microsoft Research, Montréal

Jun. 2020–Sep. 2020 *Research Intern* with Harm van Seijen

Facebook AI Applied Research

May 2019–Aug. 2019 *Research Intern* with Alborz Geramifard and Mohammad Ghavamzadeh

HONORS AND AWARDS

- 2022 MIT School of Engineering Postdoctoral Fellowship for Engineering Excellence
- 2021 3rd place award of the Two Sigma Diversity PhD Fellowship (\$5,000)

- 2020 **Best paper** award at the 4th Lifelong Learning Workshop at ICML for “Lifelong learning of factored policies via policy gradients”
- 2021, 2022 **Outstanding reviewer** or equivalent at ICLR, ICML, and NeurIPS
- 2016 Exceptionally Good Thesis award at Universidad Simón Bolívar for “Implementation of algorithms and debugging for STMicroelectronics wearable platform”
- 2015, 2016 Top 30 GPAs at Universidad Simón Bolívar among students in the final two years
- 2011 Top 10 GPAs at Universidad Simón Bolívar (3 / 750) among first-year students
- 2010 Top 50 entrance placement exams at Universidad Simón Bolívar (25 / 7409)

PUBLICATIONS

Preprints

- [P15] **J. A. Méndez** and E. Eaton. How to reuse and compose knowledge for a lifetime of tasks: A survey on continual learning and functional composition. *arXiv preprint arXiv:2207.07730*, 2022.

Journal Articles

- [J14] B. Wang, **J. A. Méndez**, C. Shui, F. Zhou, D. Wu, G. Xu, C. Gagné, and E. Eaton. Gap minimization for knowledge sharing and transfer. *Journal of Machine Learning Research*, 24(33):1–57, 2023.
- [J13] M. M. Baker, A. New, M. Aguilar-Simon, Z. Al-Halah, S. M. R. Arnold, E. Ben-Iwhiwhu, A. P. Brna, E. Brooks, R. C. Brown, Z. Daniels, A. Daram, F. Delattre, R. Dellana, E. Eaton, H. Fu, K. Grauman, J. Hostetler, S. Iqbal, C. Kent, N. Ketz, S. Kolouri, G. Konidaris, D. Kudithipudi, E. Learned-Miller, S. Lee, M. L. Littman, S. Madireddy, **J. A. Méndez**, E. Q. Nguyen, C. D. Piatko, P. K. Pilly, A. Raghavan, A. Rahman, S. K. Ramakrishnan, N. Ratzlaff, A. Soltoggio, P. Stone, I. Sur, Z. Tang, S. Tiwari, K. Vedder, F. Wang, Z. Xu, A. Yanguas-Gil, H. Yedidsion, S. Yu, and G. K. Vallabha. A domain-agnostic approach for characterization of lifelong learning systems. *Neural Networks*, 160, 2023.

Conference Papers

- [C12] **J. A. Méndez**^{*}, M. Hussing^{*}, M. Gummadi, and E. Eaton. CompoSuite: A compositional reinforcement learning benchmark. In *Proceedings of the 1st Conference on Lifelong Learning Agents (CoLLAs-22)*, 2022.
- [C11] **J. A. Méndez**, H. van Seijen, and E. Eaton. Modular lifelong reinforcement learning via neural composition. In *10th International Conference on Learning Representations (ICLR-22)*, 2022. [acceptance rate: 32%]
- [C10] M. Gummadi, C. Kent, **J. A. Méndez**, and E. Eaton. SHELS: Exclusive feature sets for novelty detection and continual learning without class boundaries. In *Proceedings of the 1st Conference on Lifelong Learning Agents (CoLLAs-22)*, 2022.
- [C9] **J. A. Méndez** and E. Eaton. Lifelong learning of compositional structures. In *9th International Conference on Learning Representations (ICLR-21)*, 2021. [acceptance rate: 29%; invited talk at ContinualAI October Online Meetup]
- [C8] **J. A. Méndez**, B. Wang, and E. Eaton. Lifelong policy gradient learning of factored policies for faster training without forgetting. In *Advances in Neural Information Processing Systems 33 (NeurIPS-20)*, 2020. [acceptance rate: 20%]

- [C7] B. Wang, **J. A. Méndez**, M. Cai, and E. Eaton. Transfer learning via minimizing the performance gap between domains. In *Advances in Neural Information Processing Systems 32 (NeurIPS)*, 2019. [acceptance rate: 21%]
- [C6] **J. A. Méndez**, S. Shivkumar, and E. Eaton. Lifelong inverse reinforcement learning. In *Advances in Neural Information Processing Systems 31 (NeurIPS-18)*, 2018. [acceptance rate: 21%]

Workshop Papers

- [W5] M. Hussing*, **J. A. Méndez***, C. Kent, and E. Eaton. Robotic manipulation datasets for offline compositional reinforcement learning. In *CoRL 2022 Workshop on Pre-training Robot Learning*, 2022. [contributed spotlight talk]
- [W4] **J. A. Méndez** and E. Eaton. Lifelong learning of factored policies via policy gradients. In *4th Lifelong Learning Workshop at the International Conference on Machine Learning (LML-ICML-20)*, 2020. [**best paper award**; contributed talk—oral acceptance rate: 10%]
- [W3] **J. A. Méndez** and E. Eaton. A general framework for continual learning of compositional structures. In *Continual Learning Workshop at the International Conference on Machine Learning (CL-ICML-20)*, 2020.
- [W2] **J. A. Méndez**, A. Geramifard, M. Ghavamzadeh, and B. Liu. Reinforcement learning of multi-domain dialog policies via action embeddings. In *3rd Conversational AI Workshop at Neural Information Processing Systems (ConvAI-NeurIPS)*, 2019. [contributed talk—oral acceptance rate: 16%]

Theses

- [T1] **J. A. Méndez**. *Lifelong machine learning of functionally compositional structures*. Ph.D. thesis, University of Pennsylvania, 2022.

TEACHING

University of Pennsylvania

- Fall-19, Spring-20 *Instructor* for CIS 192 Python Programming
- Fall-17 *Head Teaching Assistant* for CIS 419/519 Introduction to Machine Learning

Universidad Simón Bolívar

- Fall-13,14, *Teaching Assistant* for CI 2125 Programming I
- Winter-13,14,16,
Spring-13,14
- Spring-12 *Teaching Assistant* for EC 2272 Electric Circuit Analysis II
- Winter-12 *Teaching Assistant* for MA 1112 Calculus II
- Fall-11 *Teaching Assistant* for MA 1111 Calculus I

INVITED TALKS

- October 2022 **Lifelong Robotics Workshop at IROS**, *Lifelong Robot Learning via Functional Compositionality*
- February 2022 **University of Western Ontario**, *Creating Versatile Learning Agents Via Lifelong Compositionality*

February 2022 **Toyota Research Institute**, *Creating Versatile Learning Agents Via Lifelong Compositionality*

October 2020 **Continual AI Online Meetup**, *Lifelong Learning of Compositional Structures*

RESEARCH MENTORING

Ph.D. Students

2019–2022 Meghna Gummadi, Penn CIS: novelty detection and compensation

2021–2022 Marcel Hussing, Penn CIS: compositional reinforcement learning

Master's Students

2016–2018 Shashank Shivkumar, Penn ROBO: lifelong learning from demonstration (Master's thesis, NeurIPS paper). Next: Advanced AI Engineer, Honeywell

2017–2018 Varun Gupta, Penn ROBO: lifelong reinforcement learning. Next: Perception Engineer, Rivian

2019 Srinath Rajagopalan, Penn CIS: lifelong reinforcement learning. Next: Software Engineer, Amazon Robotics

2020–2021 Wenxuan Zhang, Penn AMCS: lifelong non-stationary learning (Master's thesis)

Undergraduate Students

2017 Monica Vyavahare, Penn CIS: lifelong learning from demonstration. Next: Software Engineer, Amazon Robotics

2021 Spencer Solit, Penn CIS: compositional reinforcement learning

PROFESSIONAL SERVICE

Conference Paper Reviewing

2021[†], 2022[†] ICLR, International Conference on Learning Representations

2021[†] ICML, International Conference on Machine Learning

2020, 2021[†], 2022 NeurIPS, Conference on Neural Information Processing Systems

2020, 2021, 2023 ICRA / RA-L, International Conference on Robotics and Automation

[†]Outstanding reviewer

Conference Paper Co-reviewing

2019 AAAI, Conference on Artificial Intelligence

2017–2019 IJCAI, International Joint Conference on Artificial Intelligence

2018 ICML, International Conference on Machine Learning

2018 NeurIPS, Neural Information Processing Systems

Workshop Proposal Reviewing

2021 AAAI, Conference on Artificial Intelligence

Workshop Paper Reviewing

2022 InterNLP Workshop at NeurIPS

OTHER APPOINTMENTS

Capital One

May 2017–Aug. 2017 *Data Science Intern*, Credit Card Data Science Division

STMicroelectronics

Feb. 2015–Jul. 2015 *Research & Development Intern*, Advanced Systems Technology Group