

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*, 160:274–296, 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). Next: Ph.D. student at King Abdullah University of Science and Technology

Undergraduate Students

- 2017 Monica Vyavahare, Penn CIS: lifelong learning from demonstration. Next: Software Engineer, Amazon Robotics
- 2021 Spencer Solit, Penn CIS: compositional reinforcement learning
- 2022–Present Parul Singh, MIT EECS (SuperUROP): compositional off-line reinforcement learning
- 2022 Abe Ejilemele, MIT EECS: task-free lifelong 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