Erik Wijmans

Education

Aug 2017–Aug 2022 **Ph.D. in Computer Science**, *Georgia Institute of Technology*, Atlanta, GA,
Advisors: Irfan Essa and Dhruv Batra .
Committee: Sonia Chernova, Vladlen Koltun, Vincent Vanhoucke, Gregory Wayne
Thesis: Emergence of Intelligent Navigation Behavior in Embodied Agents from Massive-Scale Simulation.
Awards: AAAI/ACM SIGAI Doctoral Dissertation Award, Sigma Xi Best Thesis, GT CoC Outstanding Doctoral Dissertation

May 2017 **Bachelor of Science, Computer Engineering, Summa Cum Laude**, *Washington University in St. Louis*, St. Louis, MO.

May 2017 **Bachelor of Science, Engineering Physics, Magna Cum Laude**, *Juniata College*, Huntingdon, PA.

Employment

July 2022 – Present **Research Scientist**, *Apple*, Cupertino, CA.
Working with Vladlen Koltun.

Honors and Awards

- Outstanding Paper Award at the International Conference on Learning Representations (ICLR) 2023.
  4 papers from 4900 submissions = top-0.08% of submitted papers.
- 2022 AAAI/ACM SIGAI Doctoral Dissertation Award Co-recipient
  Award to 2 doctoral dissertations in artificial intelligence in 2022.
- 2023 Sigma Xi Best Ph.D. Thesis Award
  Awarded to 10 Ph.D. theses from Georgia Tech in 2022 (∼700 2022 Ph.D. theses).
- 2023 Georgia Institute of Technology College of Computing (CoC) Outstanding Doctoral Dissertation Award
  Awarded to 3 dissertations in the CoC in 2022.
- 3x Scholar Award Fellowship from the Achievement Rewards for College Scientists (ARCS) Foundation (2019,2020,2021).
  Awarded to doctoral students who show exceptional promise to advance science and technology.
- 2021 Georgia Institute of Technology College of Computing (CoC) Outstanding Graduate Research Assistant Award (GRA).
  Awarded to two GRA's in the CoC.

- Best Paper Award Nominee at the International Conference on Computer Vision (ICCV), 2019.
  Nominated for the Marr Prize at ICCV, which is awarded to the best paper appearing at ICCV. 11 nominees of 4303 submissions = top-0.25%

Journal Publications

24. A. Kadian, J. Truong, A. Gokaslan, A. Clegg, **E. Wijmans**, S. Lee, M. Savva, S. Chernova and D. Batra.
  Are We Making Real Progress in Simulated Environments? Measuring the Sim2Real Gap in Embodied Visual Navigation.
  In *IEEE Robotics and Automation Letters (RA-L)*, 2020
  `https://arxiv.org/abs/1912.06321`

Conference Publications

23. M. Cusumano-Towner†, D. Hafner†, A. Hertzberg†, B. Huval†, A. Petrenko†, E. Vinitsky†, **E. Wijmans**†, T. Killian, S. Bowers, O. Sener, P. Krähenbühl, V. Koltun.
  Robust Autonomy Emerges from Self-Play.
  In *International Conference on Machine Learning (ICML)*, 2025
  `https://arxiv.org/abs/2502.03349`

22. **E. Wijmans**, B. Huval, A. Hertzberg, V. Koltun, P. Krähenbühl.
  Cut Your Losses in Large-Vocabulary Language Models.
  In *International Conference on Learning Representations (ICLR)*, 2025
  Oral talk, top-1.8% of 11,672 submissions
  `https://arxiv.org/abs/2411.09009`

21. S. K. Ramakrishnan, **E. Wijmans**, P. Krähenbühl, V. Koltun.
  Does Spatial Cognition Emerge in Frontier Models?.
  In *International Conference on Learning Representations (ICLR)*, 2025
  `https://arxiv.org/abs/2410.06468`

20. B. Shacklett, L. G. Rosenzweig, Z. Xie, B. Sarkar, A. Szot, **E. Wijmans**, V. Koltun, B. Batra, K. Fatahalian.
  An Extensible, Data-Oriented Architecture for High-Performance, Many-World Simulation.
  In *ACM Transactions on Graphics (TOG)*, 2023
  `https://drive.google.com/file/d/1wn4VekbZ5A-TTGKMweN8HV9_IyJqd3dM/view`

19. **E. Wijmans**, M. Savva, I. Essa, S. Lee, A. Morcos, and D. Batra.
  Emergence of Maps in the Memories of Blind Navigation Agents.
  In *International Conference on Learning Representations (ICLR)*, 2023
  Outstanding Paper Award, top-0.08% of 4900 submissions

https://arxiv.org/abs/2301.13261

18. **E. Wijmans**, I. Essa, D. Batra.
VER: Scaling On-Policy RL Leads to Emergence of Navigation in Embodied Rearrangement.
In *Neural Information Processing Systems (NeurIPS)*, 2022
https://arxiv.org/abs/2210.05064

17. R. Partsey, **E. Wijmans**, N. Yokoyama, O. Dobosevych, D. Batra, O. Maksymets.
Is Mapping Necessary for Realistic PointGoal Navigation?.
In *Computer Vision and Pattern Recognition (CVPR)*, 2022
https://arxiv.org/abs/2206.00997

16. **E. Wijmans**, I. Essa, and D. Batra.
How to Train PointGoal Navigation Agents on a (Compute and Sample) Budget.
In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2022
https://arxiv.org/abs/2012.06117

15. S. K. Ramakrishnan, A. Gokaslan, **E. Wijmans**, O. Maksymets, A. Clegg, J. Turner, E. Undersander, W. Galuba, A. Westbury, A. X. Chang, M. Savva, Y. Zhao, D. Batra.
Habitat-Matterport 3D Dataset (HM3D): 1000 Large-scale 3D Environments for Embodied AI.
In *Neural Information Processing Systems Track on Datasets and Benchmarks*, 2021
https://arxiv.org/abs/2109.08238

14. A. Szot, A. Clegg, E. Undersander, **E. Wijmans**, Y. Zhao, J. Turner, N. Maestre, M. Mukadam, D. Chaplot, O. Maksymets, A. Gokaslan, V. Vondrus, S. Dharur, F. Meier, W. Galuba, A. Chang, Z. Kira, V. Koltun, J. Malik, M. Savva, D. Batra.
Habitat 2.0: Training Home Assistants to Rearrange their Habitat.
In *Neural Information Processing Systems (NeurIPS)*, 2021
Spotlight, top 3% of 9122 submissions.
https://arxiv.org/abs/2106.14405

13. J. Ye, D. Batra, A. Das, **E. Wijmans**.
Auxiliary Tasks and Exploration Enable ObjectNav.
In *International Conference on Computer Vision (ICCV)*, 2021
https://arxiv.org/abs/2104.04112

12. O. Maksymets, V. Cartillier, A. Gokaslan, **E. Wijmans**, W. Galuba, S. Lee, D. Batra.
THDA: Treasure Hunt Data Augmentation for Semantic Navigation.
In *International Conference on Computer Vision (ICCV)*, 2021

11. A. Petrenko, **E. Wijmans**, B. Shacklett and V. Koltun.
Megaverse: Simulating Embodied Agents at One Million Experiences per Second.

In *International Conference on Machine Learning (ICML)*, 2021
`http://vladlen.info/papers/megaverse.pdf`

10. B. Shacklett, **E. Wijmans**, A. Petrenko, M. Savva, V. Kolutn, D. Batra, K. Fatahalian.
Large Batch Simulation for Deep Reinforcement Learning.
In *International Conference on Learning Representations (ICLR)* , 2021
`https://arxiv.org/abs/2103.07013`

9. J. Ye, D. Batra, **E. Wijmans**†, and A. Das†.
Auxiliary Tasks Speed Up Learning PointGoal Navigation.
In *Conference on Robot Learning (CoRL)*, 2020
`https://arxiv.org/abs/2007.04561`

8. J. Krantz, **E. Wijmans**, A. Majumdar, D. Batra, and S. Lee.
Beyond the Nav-Graph: Vision-and-Language Navigation in Continuous Environments.
In *European Conference on Computer Vision (ECCV)*, 2020
`https://arxiv.org/abs/2004.02857`

7. M. Narasimhan, **E. Wijmans**, X. Chen, T. Darrell, D. Batra, D. Parikh, and A. Singh.
Seeing the Un-Scene: Learning Amodal Semantic Belief Maps for Room Navigation.
In *European Conference on Computer Vision (ECCV)*, 2020
`https://arxiv.org/abs/2007.09841`

6. A. Kadian, J. Truong, A. Gokaslan, A. Clegg, **E. Wijmans**, S. Lee, M. Savva, S. Chernova and D. Batra.
Are We Making Real Progress in Simulated Environments? Measuring the Sim2Real Gap in Embodied Visual Navigation.
In *International Conference on Intelligent Robots and Systems (IROS)*, 2020
`https://arxiv.org/abs/1912.06321`

5. **E. Wijmans**, A. Kadian, A. Morcos, S. Lee, I. Essa, D. Parikh, M. Savva, and D. Batra.
DD-PPO: Learning Near-Perfect PointGoal Navigators from 2.5 Billion Frames.
In *International Conference on Learning Representations (ICLR)*, 2020
`https://arxiv.org/abs/1911.00357`

4. M. Savva†, A. Kadian†, O. Maksymets†, Y. Zhao, **E. Wijmans**, B. Jain, J. Straub, J. Liu, V. Koltun, J. Malik, D. Parikh, and D. Batra.
Habitat: A Platform for Embodied AI Research.
In *International Conference on Computer Vision (ICCV)*, 2019
Oral Talk, top 187 of 4303 submissions = top-4.3%
Best Paper Award Nominee, top 11 of 4303 submissions = top-0.25%
`https://arxiv.org/abs/1904.01201`

3. **E. Wijmans**†, S. Datta†, O. Maksymets†, A. Das, G. Gkioxari, S. Lee, I. Essa, D. Parikh, and D. Batra.
Embodied Question Answering in Photorealistic Environments with Point Cloud Perception.
In *Computer Vision and Pattern Recognition (CVPR)*, 2019
Oral Talk, top 288 of 5160 submissions = top-5.5%
`https://arxiv.org/abs/1904.03461`

2. **E. Wijmans** and Y. Furukawa.
Exploiting 2D Floorplan for Building-Scale Panorama RGB-D Alignment.
In *Computer Vision and Pattern Recognition (CVPR)*, 2017
`https://arxiv.org/abs/1612.02859`

1. Y. Cao, S. Li, and **E. Wijmans**.
(Cross-)Browswer Fingerprinting via OS and Hardware Level Features.
In *Network and Distributed System Security Symposium (NDSS)*, 2017
`https://yinzhicao.org/TrackingFree/crossbrowsertracking_NDSS17.pdf`

Workshop Publications and Tech Reports

4. G. Grande, D. Batra, **E. Wijmans**.
Realistic PointGoal Navigation via Auxiliary Losses and Information Bottleneck.
In *arXiv*, 2021
`https://arxiv.org/abs/2109.08677`

3. D. Batra and A. Gokaslan and A. Kembhavi and O. Maksymets and R. Mottaghi and M. Savva and A. Toshev and **E. Wijmans**.
ObjectNav Revisited: On Evaluation of Embodied Agents Navigating to Objects.
In *arXiv*, 2020
`https://arxiv.org/abs/2006.13171`

2. **E. Wijmans**, J. Straub, D. Batra, I. Essa, J. Hoffman, A. Morcos.
Analyzing Visual Representations in Embodied Navigation Tasks.
In *ICLR 2019 Workshop on Task Agnostic Reinforcement Learning and arXiv*, 2020
`https://arxiv.org/abs/2003.05993`

1. J. Straub, T. Whelan, L. Ma, Y. Chen, **E. Wijmans**, S. Green, J. J. Engel, R. Mur-Artal,C. Ren, S. Verma, A. Clarkson, M. Yan, B. Budge, Y. Yan, X. Pan, J. Yon, Y. Zou,K. Leon, N. Carter, J. Briales, T. Gillingham, E. Mueggler, L. Pesqueira, M. Savva, D. Batra, H. M. Strasdat, R. D. Nardi, M. Goesele, S. Lovegrove, and R. Newcombe.
The Replica Dataset: A Digital Replica of Indoor Spaces.
In *arXiv*, 2019
`https://arxiv.org/abs/1906.05797`

Internships and Part-Time

Aug. 2020 – May 2022 **Visiting Scientist**, *Meta FAIR*, Menlo Park, CA.

May–Aug. 2020 **Research Intern, Intelligent Systems**, *Intel*, Santa Clara, CA.
Host: Vladlen Koltun

Aug. 2019 – May 2020 **Visiting Scientist**, *Facebook AI Research*, Menlo Park, CA.

May–Aug. 2019 **Research Intern**, *Facebook AI Research*, Menlo Park, CA.
Host: Manolis Savva

- Examine what agents learn when they learn to navigate (lead to Publication #19).

Aug. 2018 – May 2019 **Research Scientist (Contractor)**, *Facebook Reality Labs*, Redmond, WA.

May–Aug. 2018 **Research Intern**, *Facebook Reality Labs*, Redmond, WA.
Host: Julian Straub

- Worked on the first steps towards the Replica Dataset and AI Habitat.

May–Aug. 2016 **NSF REU Fellow**, *Lehigh University*, Bethlehem, PA.
Mentored by Yinzhi Cao (now at Johns Hopkins University).

May–Aug. 2015 **NSF REU Fellow**, *Washington University in St. Louis*, St. Louis, MO.
Mentored by Yasutaka Furukawa (now at Simon Fraser University).

Posters and Invited Talks

Oct. 2021 **Invited Talk**, *Georgia Tech RoboGrads Seminar*, Atlanta, GA.
Emergence of Intelligent Behavior in Embodied AI Agents from Massive Scale Simulation

Sept. 2021 **Invited Talk**, *UCL Dark*, Virtual.
Emergence of Intelligent Behavior in Embodied AI Agents from Massive Scale Simulation

April 2021 **Invited Talk**, *Georgia Tech RoboGrads Seminar*, Atlanta, GA.
Training Virtual Robots in Realistic Simulators

Mentorship

Fall 2019 – Spring 2021 **Joel Ye**, *GT MS → CMU PhD Student*.
Publications: #9 (CoRL' 20), #13 (ICCV'21)

Fall 2019 – Spring 2021 **Guillermo Grande**, *GT MS → Microsoft*.
Tech Reports: #4

Professional Activities

- Lead Organizer for AI Habitat Tutorial, ECCV 2020
- Lead Organizer for Embodied AI Workshop, CVPR 2020, 2021
- Organizer for Visually Grounded Interaction and Language Workshop, 2018-21

- Organizer for Habitat: Embodied AI Challenge & Workshop, CVPR 2019
- Reviewer for NeurIPS, CVPR, ECCV, ICLR, and RA-L
- Area chair for NeurIPS 2023, 2025, and ICLR 2026
- Outstanding Reviewer, Computer Vision and Pattern Recognition Conference (CVPR) 2021

Teaching

- Guest Lecture on Embodied AI, Deep Reinforcement Learning for Intelligent Control, Spring 2022
- Guest Lecture on Neural Architecture Search, Deep Learning, Fall 2021
- Guest Lecture on Neural Architecture Search, Deep Learning, Fall 2020
- Guest Lecture on Embodied AI, Deep Learning, Fall 2019
- Teaching Assistant, Deep Learning, Fall 2018
- Teaching Assistant, Machine Learning, Fall 2017
- Teaching Assistant, Introduction to Systems Software, Spring 2016 – Spring 2017