Erik Wijmans

Education

Aug 2017– Aug 2022	**Ph.D. in Computer Science**, *Georgia Institute of Technology*, Atlanta, GA, Advisors: Irfan Essa and Dhruv Batra. Thesis: Emergence of Intelligent Navigation Behavior in Embodied Agents from Massive-Scale Simulation. Committee: Dhruv Batra, Irfan Essa, Sonia Chernova, Vladlen Koltun, Vincent Vanhoucke, Gregory Wayne
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

- 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.

- Outstanding Reviewer, Computer Vision and Pattern Recognition Conference (CVPR) 2021

- 2021 Georgia Institute of Technology College of Computing (CoC) Outstanding Graduate Research Assistant Award (GRA).
  Two awards for all GRA's in 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%

- Washington University in St. Louis Department of Computer Science and Engineering Outstanding Junior Award.
  Awarded to students who demonstrate academic and research excellence. (3 awards for ∼100 eligible juniors)

○ Harold P. Brown Engineering Fellowship.
Award to 3-2 engineering students who demonstrate academic excellence and substantial community service. (2 awards for ∼100 applicants)

Journal Publications

23. 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

22. **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`

21. 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`

20. **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`

19. 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`

18. 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

17. 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

16. 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

15. 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

14. 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

13. 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

12. 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

11. 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

10. 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

9. **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

8. 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

7. **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

6. **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

5. 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

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

May–Aug. 2019   **Research Intern**, *Facebook AI Research*, Menlo Park, CA.
Host: Manolis Savva
- Studying what agents learn when they solve a large-scale AI task

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

May 2020   **Poster and Invited Talk**, *ICLR 2020*, Virtual.
For DD-PPO: Learning Near-Perfect PointGoal Navigators from 2.5 Billion Frames

June 2019   **Poster and Invited Talk**, *CVPR 2019*, Long Beach, CA.
For Embodied Question Answering in Photorealistic Environments with Point Cloud Perception

June 2019	**Invited Talk**, *Habitat Embodied Agents Workshop, 2019*, Long Beach, CA.
	About my top entry to the Habitat-Challenge leader-board
2017	**Poster**, *CVPR 2017*, Honolulu, Hawaii.
	For Exploiting 2D Floorplan for Building-scale Panorama RGBD Alignment

Mentorship

Fall 2019 – Spring 2021	**Joel Ye**, *GT MS → CMU PhD Student*.
	Publications: #13 (CoRL' 20), #17 (ICCV'21)
Fall 2019 – Spring 2021	**Guillermo Grande**, *GT MS → Microsoft*.
	Tech Reports: #4

Professional Activities

o Lead Organizer for AI Habitat Tutorial, ECCV 2020

o Lead Organizer for Embodied AI Workshop, CVPR 2020, 2021

o Organizer for Visually Grounded Interaction and Language Workshop, 2018-21

o Organizer for Habitat: Embodied AI Challenge & Workshop, CVPR 2019

o Reviewer for NeurIPS 2019-22, CVPR 2020-22, ECCV 2020, ICLR 2021-2, and RA-L

Teaching

o Guest Lecture on Embodied AI, Deep Reinforcement Learning for Intelligent Control, Spring 2022

o Guest Lecture on Neural Architecture Search, Deep Learning, Fall 2021

o Guest Lecture on Neural Architecture Search, Deep Learning, Fall 2020

o Guest Lecture on Embodied AI, Deep Learning, Fall 2019

o Teaching Assistant, Deep Learning, Fall 2018

o Teaching Assistant, Machine Learning, Fall 2017

o Teaching Assistant, Introduction to Systems Software, Spring 2016 – Spring 2017