

Adam Sigal

 [Website](#) |  [linkedin.com/in/adam-sigal](https://www.linkedin.com/in/adam-sigal) |  Citizenship: US, Canada

Experience

Senior Research Engineer, Machine Learning

2025 –

Torq Robotics Autonomous Trucking

Montreal, QC, Canada

- **TruckDrive: Long-Range Autonomous Highway Driving Dataset** | [paper](#), [blog](#) (CVPR '26).
 - Synchronized long-range (1km) LiDAR, radar, camera, dense depth, refined ego-poses, 2D & 3D labels; 475k scenes.
- Lane line pseudolabeling: developed model integrated into new end-to-end production pipeline.
 - Analyzed human annotation and online depth estimation data; collaborated to improve data quality and model performance.
- Vehicle behavior model: mitigated trajectory prediction mode collapse via loss design, curriculum fine tuning.
 - MLOps: standardized usage and enabled cross-team experiment comparison; implemented more informative model evaluation metrics, LR scaling for parallelism, and a hyperparameter optimization framework for systematic model improvement.

Senior Researcher, Embodied AI

2024–2025

Huawei Noah's Ark Lab

Montreal, QC, Canada

- **Improving Robotic Manipulation Robustness via NICE Scene Surgery** | [paper](#) (ICRA '26).
 - Built scalable data augmentation toolkit for real manipulation trajectories.
 - $>\Omega(2^n)$ increase in visual diversity of collected real robot demonstration data.
 - Analyzes objects in scene, recolor, retexure, inpaint, replace with diffusion-gen. objects diversified with LLM suggestions.

Research Engineer, Machine Learning and Robotics

2022 – 2024

Samsung AI Center Montreal

Montreal, QC, Canada

- **SAGE: Smart Home Agent with Grounded Execution** | [paper](#), [blog](#) (IoT-J).
 - Agent-based smart home assistant framework. Leverages LLMs to interpret & execute human commands with minimal setup.
 - SAGE outperformed all previous methods by 2.5 $\times$, succeeding at demanding, ambiguous requests (e.g. "put the game on").
 - Integrates LangChain, RAG with user-interaction history, smart device & webapp APIs, visual-language models (CLIP) and generative code writing.
 - Collaborated with 6-person research team, performing rapid 5-month turnaround for major project following change in company's research directives.
 - Led integration of external API usage and smart TV interaction by LLM agent, enabling more complex user commands.
 - Led performance evaluation on multimodal smart home tasks, and developed benchmark of more realistic, challenging tests.
- **STS: See-Through-your-Skin** visuotactile robot finger sensor – manipulation for in-home robotics.
 - Semi-transparent GelSight sensor with dual distance + tactile imagery.
 - Led codebase overhaul (Python, ROS, Docker, CAD) – used by Samsung research teams in Montreal, Japan, and Korea.
 - **Multimodal and Force-Matched Imitation Learning with a See-Through Visuotactile Sensor** | [paper](#), [blog](#) (ICRA '25, T-RO).
 - 82% performance gain with STS vs. conventional methods for imitation learning of tasks requiring human force-matching.
 - Collaborated in experiment design, data collection, and code development | [repo](#).
- **Learning From Mistakes**: using energy-based models to leverage both successes and failures in imitation learning.

Research Intern

2018

Mila (Quebec Artificial Intelligence Institute), in partnership with MIT & ETH Zurich

Montreal, QC, Canada

- **Duckietown** autonomous vehicle platform – **AI Driving Olympics Competition** | [paper](#), [blog](#) (NeurIPS, ICRA '18–'21).
- Developed generative methods for IL, RL, CV domain randomization in Duckietown Gym simulator (Python & PyTorch) | [repo](#).

Education

McGill University | Mila (Quebec Artificial Intelligence Institute)

2020 – 2022

Master of Engineering, ECE – ML, Robotics, HRI

- **Research Topic: Improving RL Training Regimes for Social Robot Navigation** | [paper](#) (NeurIPS '23 GenPlan Workshop).
 - Explored how autonomous robots can navigate in human pedestrian spaces without infringing upon social norms.
 - Developed training methods to achieve 14% gain over SOTA, measured by *collision rate*, *human discomfort level* and *frequency*.

University of Montreal

2016 – 2019

Bachelor of Science, Computer Science

Skills

Languages and Tools: Python, PyTorch, Lightning, NumPy, Pandas, AWS, ROS, Java, Git, Docker, Linux.

Machine Learning: Computer Vision, NLP, CNNs, Sequential Models, Transformers, LLMs, GANs, Reinforcement Learning.

Publications

- [1] Filippo Ghilotti*, Edoardo Palladin*, Samuel Brucker*, **Adam Sigal***, Mario Bijelic*, and Felix Heide. [TruckDrive: Long-Range Autonomous Highway Driving Dataset](#). In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2026.
- [2] Sajjad Pakdamansavoji*, Mozghan Pourkeshavarz*, **Adam Sigal***, Zhiyuan Li, Rui Heng Yang, and Amir Rasouli. Improving Robotic Manipulation Robustness via NICE Scene Surgery. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2026.
- [3] Mozghan Pourkeshavarz*, **Adam Sigal***, Sajjad Pakdamansavoji, Zhiyuan Li, Rui Heng Yang, and Amir Rasouli. [Don't Get Distracted: Improving Robotic Perception Robustness via In-Context Visual Scene Editing](#). In *Workshop on Making Sense of Data in Robotics: Composition, Curation, and Interpretability at Scale at the Conference on Robot Learning (CoRL)*, 2025.
- [4] Leo Maxime Brunswic, Mateo Clemente, Rui Heng Yang, **Adam Sigal**, Amir Rasouli, and Yinchuan Li. [Ergodic generative flows](#). In *Proceedings of the 41st International Conference on Machine Learning (ICML)*, Proceedings of Machine Learning Research. PMLR, 2025.
- [5] Trevor Ablett, Oliver Limoyo, **Adam Sigal**, Affan Jilani, Jonathan Kelly, Kaleem Siddiqi, Francois Hogan, and Gregory Dudek. [Multimodal and force-matched imitation learning with a see-through visuotactile sensor](#). *IEEE Transactions on Robotics (T-RO)*, 41:946–959, 2024; *International Conference on Robotics and Automation (ICRA)*, 2025.
- [6] Dmitriy Rivkin, Francois Hogan, Amal Feriani, Abhisek Konar, **Adam Sigal**, Xue Liu, and Gregory Dudek. [AloT smart home via autonomous LLM agents](#). *IEEE Internet of Things Journal (IoT-J)*, 12(3):2458–2472, 2024.
- [7] **Adam Sigal**, Hsiu-Chin Lin, and AJung Moon. [Improving generalization in reinforcement learning training regimes for social robot navigation](#). In *Advances in Neural Information Processing Systems (NeurIPS), Workshop on Generalization in Planning*. Curran Associates, Inc., 2023.
- [8] Andrea Censi, Liam Paull, Jacopo Tani, Thomas Ackermann, Oscar Beijbom, Berabi Berkai, Gianmarco Bernasconi, Anne Kirsten Bowser, Simon Bing, Pin-Wei David Chen, Yu-Chen Chen, Maxime Chevalier-Boisvert, Breandan Considine, Justin De Castri, Maurilio Di Cicco, Manfred Diaz, Paul Aurel Diederichs, Florian Golemo, Ruslan Hristov, Lily Hsu, Yi-Wei Daniel Huang, Chen-Hao Peter Hung, Qing-Shan Jia, Julien Kindle, Dzenan Lapandic, Cheng-Lung Lu, Sunil Mallya, Bhairav Mehta, Aurel Neff, Eryk Nice, Yang-Hung Allen Ou, Abdelhakim Qbaich, Josefina Quack, Claudio Ruch, **Adam Sigal**, Niklas Stolz, Alejandro Unghia, Ben Weber, Sean Wilson, Zi-Xiang Xia, Timothius Victorio Yasin, Nivethan Yogarajah, Julian Zilly, Yoshua Bengio, Tao Zhang, Hsueh-Cheng Wang, Stefano Soatto, Magnus Egerstedt, Emilio Frazzoli. [The AI Driving Olympics at NeurIPS 2018](#). In *The NeurIPS '18 Competition*, pages 37–68, Cham, 2020. Springer International Publishing.