Chris Agia

cagia@cs.stanford.edu
www.chrisagia.com
github.com/agiachris
linkedin.com/agiachris

EDUCATION

Stanford University   2021 – Present
Doctor of Philosophy in Computer Science
Advisors: Prof. Jeannette Bohg, Prof. Marco Pavone
Co-founder & President, Canadian Student Association at Stanford. Lead Organizer, Stanford AI Salon

University of Toronto   2016 – 2019, 2020 – 2021
Bachelor of Applied Science in Engineering Science, Robotics
Advisor: Prof. Florian Shkurti. Graduation with Honors, Dean's Honor List 2018 – 2021

SELECTED RESEARCH EXPERIENCES

Interactive Perception and Robot Learning Lab, Stanford University   Stanford, CA, USA
Graduate Researcher advised by Prof. Jeannette Bohg   2022-01 – Present
Topics: (focus) robot data curation [Site]*, task and motion planning with learned skills* [Site] *and large language models* [Site, Site, Site]*; (involved) imitation learning, deep reinforcement learning, constrained optimization*

Autonomous Systems Lab, Stanford University   Stanford, CA, USA
Graduate Researcher advised by Prof. Marco Pavone   2022-03 – Present
Topics: (focus) reliability for robot imitation learning [Site, Site]*, foundation models for robot safety* [Site, Site, Site]*; (involved) uncertainty quantification, out-of-distribution detection, deep offline reinforcement learning*

RESEARCH EXPERIENCES

FAIR Embodiment & Actions, Meta   Menlo Park, CA, USA
Research Scientist Intern advised by Dr. Krishna Jatavallabhula and Dr. Franziska Meier   2025-06 – Present
Topics: large-scale world modeling for robotics

NASA Jet Propulsion Laboratory, California Institute of Technology   Pasadena, CA, USA
Visiting Researcher advised by Dr. Issa Nesnas and Dr. Saptarshi Bandyopadhyay   2023-06 – 2023-09
Topics: autonomy for deep space exploration [Site]*; Section 347: mobility and robotic systems*

Stanford Vision and Learning Lab, Stanford University   Stanford, CA, USA
Graduate Researcher advised by Prof. Jiajun Wu   2021-09 – 2022-02
Topics: neuro-symbolic models for AI task planning

Robot Vision and Learning Lab, Vector Institute & University of Toronto   Toronto, Canada
Undergraduate Researcher advised by Prof. Florian Shkurti   2020-05 – 2021-05
Topics: robot task planning in structured world models with graph neural networks [Site]

Mobile Robotics Lab, MILA & McGill University   Montreal, QC, Canada
Research Intern co-supervised by Prof. Gregory Dudek and Prof. David Meger   2020-01 – 2020-05
Topics: learning for visual SLAM [Paper]*, visual representations for reinforcement learning* [Paper]

Noah's Ark Lab, Huawei Research Canada   Markham, ON, Canada
Deep Learning Research Intern, perception and localization with Dr. Bingbing Liu   2019-05 – 2020-05
Topics: 3D semantic scene reconstruction [Paper]*, segmentation and semantic SLAM* [Paper]

Autonomous Systems and Biomech. Lab, University of Toronto   Toronto, ON, Canada
Research Intern supervised by Prof. Goldie Nejat   2018-05 – 2018-08
Topics: sim2real transfer for robot reinforcement learning [Paper]

INDUSTRY EXPERIENCES

Mixed Reality and Robotics, **Microsoft**   Redmond, WA, USA
Software Engineering Intern on the Scene Understanding and Data Teams (HoloLens)   2021-05 – 2021-08

Topics: bridging multi-agent reinforcement learning and mixed reality environments

Cloud, **Google** — San Francisco, CA, USA
Software Engineering Intern building ABI simulators with the Istio Networking Team — 2020-05 – 2020-08

Honors and Awards

Clear Ventures Deeptech Fellowship — 2023
Awarded to promising PhD candidates and post-docs that aspire to build deep tech companies

Stanford School of Engineering Fellowship, Computer Science — 2021
Awarded to outstanding students pursuing doctoral degrees in computer science and engineering

Ontario Engineering Competition — 2019
Awarded first prize at Toronto's district and Ontario's provincial programming competitions

NSERC Undergraduate Student Research Award — 2018
Awarded to undergraduate science and engineering students on the basis of research aptitude

President's Scholarship Program — 2016
Awarded to top engineering candidates pursuing studies at the University of Toronto

Publications

Preprints

[1] C. Agia, R. Sinha, J. Yang, R. Antonova, M. Pavone, H. Nishimura, M. Itkina, and J. Bohg, "Cupid: Curating data your robot loves with influence functions," 2025, Accepted to CoRL 2025. [Online]. Available: https://arxiv.org/abs/2506.19121.

[2] M. Ganai, R. Sinha, C. Agia, D. Morton, and M. Pavone, "Real-time out-of-distribution failure prevention via multi-modal reasoning," 2025, Accepted to CoRL 2025. [Online]. Available: https://arxiv.org/abs/2505.10547.

[3] J. Kwok, C. Agia, R. Sinha, M. Foutter, S. Li, I. Stoica, A. Mirhoseini, and M. Pavone, "Robomonkey: Scaling test-time sampling and verification for vision-language-action models," 2025, Accepted to CoRL 2025. [Online]. Available: https://arxiv.org/abs/2506.17811.

Refereed Conference Papers

[1] Y. Huang, C. Agia, J. Wu, T. Hermans, and J. Bohg, "Points2plans: From point clouds to long-horizon plans with composable relational dynamics," in *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025. [Online]. Available: https://arxiv.org/abs/2408.14769.

[2] C. Agia, R. Sinha, J. Yang, Z. Cao, R. Antonova, M. Pavone, and J. Bohg, "Unpacking failure modes of generative policies: Runtime monitoring of consistency and progress," in *Proceedings of the 8th Conference on Robot Learning (CoRL)*, ser. Proceedings of Machine Learning Research, vol. 270, PMLR, 2025, pp. 689–723. [Online]. Available: https://arxiv.org/abs/2410.04640.

[3] J. Thumm, C. Agia, M. Pavone, and M. Althoff, "Text2interaction: Establishing safe and preferable human-robot interaction," in *Proceedings of the 8th Conference on Robot Learning (CoRL)*, ser. Proceedings of Machine Learning Research, vol. 270, PMLR, 2025, pp. 1250–1267. [Online]. Available: https://arxiv.org/abs/2408.06105.

[4] M. Bazzi, A. Shahid, C. Agia, J. Alora, M. Forgione, D. Piga, F. Braghin, M. Pavone, and L. Roveda, "Robomorph: In-context meta-learning for robot dynamics modeling," in *International Conference on Informatics in Control, Automation and Robotics*, 2024. [Online]. Available: https://arxiv.org/abs/2409.11815.

[5] R. Sinha, A. Elhafsi, C. Agia, M. Foutter, E. Schmerling, and M. Pavone, "Real-time anomaly detection and reactive planning with large language models," in *Robotics: Science and Systems*, Outstanding Paper Award, 2024. [Online]. Available: https://arxiv.org/abs/2407.08735.

[6] DROID Dataset Team, "Droid: A large-scale in-the-wild robot manipulation dataset," in *Robotics: Science and Systems*, 2024. [Online]. Available: https://arxiv.org/abs/2403.12945.

[7] Open X-Embodiment Collaboration, "Open X-Embodiment: Robotic learning datasets and RT-X models," in *2024 IEEE International Conference on Robotics and Automation (ICRA)*, Best Paper Award, 2024. [Online]. Available: `https://arxiv.org/abs/2310.08864`.

[8] C. Agia, G. C. Vila, S. Bandyopadhyay, D. S. Bayard, K. Cheung, C. H. Lee, E. Wood, I. Aenishanslin, S. Ardito, L. Fesq, M. Pavone, and I. A. D. Nesnas, "Modeling considerations for developing deep space autonomous spacecraft and simulators," in *IEEE Aerospace Conference (AeroConf)*, 2024. [Online]. Available: `https://arxiv.org/abs/2401.11371`.

[9] C. Agia, T. Migimatsu, J. Wu, and J. Bohg, "Stap: Sequencing task-agnostic policies," in *2023 IEEE International Conference on Robotics and Automation (ICRA)*, 2023, pp. 7951–7958. DOI: `10.1109/ICRA48891.2023.10160220`. [Online]. Available: `https://arxiv.org/abs/2210.12250`.

[10] C. Agia, K. M. Jatavallabhula, M. Khodeir, O. Miksik, V. Vineet, M. Mukadam, L. Paull, and F. Shkurti, "Taskography: Evaluating robot task planning over large 3d scene graphs," in *Proceedings of the 5th Conference on Robot Learning (CoRL)*, ser. Proceedings of Machine Learning Research, vol. 164, PMLR, 2022, pp. 46–58. [Online]. Available: `https://arxiv.org/abs/2207.05006`.

[11] R. Cheng, C. Agia, F. Shkurti, D. Meger, and G. Dudek, "Latent attention augmentation for robust autonomous driving policies," in *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021, pp. 130–136. DOI: `10.1109/IROS51168.2021.9636449`.

[12] R. Cheng, C. Agia, Y. Ren, X. Li, and L. Bingbing, "S3cnet: A sparse semantic scene completion network for lidar point clouds," in *Proceedings of the 2020 Conference on Robot Learning (CoRL)*, ser. Proceedings of Machine Learning Research, vol. 155, PMLR, 2021, pp. 2148–2161. [Online]. Available: `https://arxiv.org/abs/2012.09242`.

[13] R. Cheng, C. Agia, D. Meger, and G. Dudek, "Depth prediction for monocular direct visual odometry," in *2020 17th Conference on Computer and Robot Vision (CRV)*, IEEE Computer Society, 2020, pp. 70–77.

REFEREED JOURNAL PAPERS

[1] K. Lin, C. Agia, T. Migimatsu, M. Pavone, and J. Bohg, "Text2motion: From natural language instructions to feasible plans," *Autonomous Robots, Special Issue: Large Language Models in Robotics*, 2023. DOI: `10.1007/s10514-023-10131-7`. [Online]. Available: `https://arxiv.org/abs/2303.12153`.

[2] A. Elhafsi, R. Sinha, C. Agia, E. Schmerling, I. A. D Nesnas, and M. Pavone, "Semantic anomaly detection with large language models," *Autonomous Robots, Special Issue: Large Language Models in Robotics*, 2023. DOI: `10.1007/s10514-023-10132-6`. [Online]. Available: `https://arxiv.org/abs/2305.11307`.

[3] Y. Ren, B. Liu, R. Cheng, and C. Agia, "Lightweight semantic-aided localization with spinning lidar sensor," *IEEE Transactions on Intelligent Vehicles*, vol. 8, no. 1, pp. 605–615, 2021. DOI: `10.1109/TIV.2021.3099022`.

[4] H. Hu, K. Zhang, A. H. Tan, M. Ruan, C. Agia, and G. Nejat, "A sim-to-real pipeline for deep reinforcement learning for autonomous robot navigation in cluttered rough terrain," *IEEE Robotics and Automation Letters*, vol. 6, no. 4, pp. 6569–6576, 2021. DOI: `10.1109/LRA.2021.3093551`.

THESIS PAPERS

[1] C. Agia and F. Shkurti, "Contextual graph representations for task-driven 3d perception and planning," Undergraduate Dissertation, University of Toronto, Toronto, ON, 2021. [Online]. Available: `https://drive.google.com/file/d/1LjTdgwuiJa-gIiVbbqj9vh-qoEZgqkb_/view?usp=sharing`.

INVITED TALKS

IEEE CASE. Data-Centric Understanding of Policy Behavior and Performance with Influence Functions	2025-08
TRI. Data-Centric Understanding of Policy Behavior and Performance with Influence Functions	2025-07
SystemX Conference, Stanford University. Learning to solve long-horizon tasks (YouTube)	2023-11
Facebook AI Research. Taskography: Evaluating robot task planning over large 3d scene graphs	2021-07
Microsoft Research. Robot task planning in structured world models	2021-07

PROFESSIONAL SERVICE AND TEACHING

Workshop Organizing

1. "Making Sense of Data in Robotics: Challenges in Collection, Curation, and Interpretability at Scale," held at the Conference on Robot Learning (CoRL), 2025. **Lead organizer**. Workshop Site.

2. "The 2nd Workshop on Out-of-Distribution Generalization in Robotics: Towards Trustworthy AI-driven Autonomy," held at Robotics: Science and Systems (RSS), 2025. **Supporting organizer**. Workshop Site.

Additional Service
Journal Service: Reviewer for IJRR, RA-L
Conference Service: Reviewer for RSS, CoRL, CVPR, ICRA, IROS, ISER, AeroConf

2 x Teaching assistant for Stanford AA174A/CS137A/EE160A (2023, 2024): Principles of Robot Autonomy 1
1 x Teaching assistant for Stanford AA274B/CS237B/EE260B/ME274B (2025): Principles of Robot Autonomy 2

PATENTS

- Agia, C.G., Cheng, R., Ren, Y., Liu, B. (2022). *Systems and Methods for Generating a Road Surface Semantic Segmentation Map from a Sequence of Point Clouds* (U.S. Application No. 17/676,131, U.S. Patent No. 12,008,762). U.S. Patent and Trademark Office. Google Patents link.

- Cheng, R., Agia, C.G., Ren, Y., Liu, B. (2022). *Methods and Systems for Semantic Scene Completion for Sparse 3D Data* (U.S. Application No. 17/492,261, U.S. Patent No. 12,079,970). U.S. Patent and Trademark Office. Google Patents link.

COMMUNITY SERVICE AND LEADERSHIP

Canadian Student Association, Stanford University   2024-01 – Present
Co-founder and President of Stanford's Canadian Student Association

Stanford AI Salon, Stanford University   2021-10 – Present
Lead Organizer of Stanford's AI Salon, a platform facilitating open-ended discussion between graduate students, industry, and academic leaders on contemporary ML & AI topics and their societal implications

Stanford CS Mentorship Program, Stanford University   2021-10 – Present
Advising students from underrepresented and minority groups to lead fruitful careers in computer science research

Frosh Scholars Mentorship Program, Stanford University   2021-10 – 2022-07
Mentoring first generation college students towards balanced progress in academics, career, and well-being

Pro Bono Research Mentoring   2021-01 – Present
Guided many undergraduate research students through applications at top graduate engineering schools

NSight Student Mentorship Program, University of Toronto   2018-09 – 2019-05
Provided academic, social, and personal support to first and second year Engineering Science students

SKILLS

Languages: (*Proficient*) Python, C/C#/C++, MATLAB, Rust, LaTeX, Bash - (*Working*) Java, Assembly
Tools: Git, Linux/Unix, Unity, Docker, Wasmtime (WebAssembly), Kubernetes
Libraries: PyTorch, TensorFlow, ROS, NumPy, ml-agents, PCL, OpenCV, SciPy, scikit-learn, Pandas, Jupyter