

EDUCATION

Stanford University

2021 – Present

Doctor of Philosophy in Computer Science

Co-advisors: Jeannette Bohg, Marco Pavone

University of Toronto

2016 – 2019, 2020 – 2021

Bachelor of Applied Science in Engineering Science, Robotics

Advisor: Prof. Florian Shkurti. Graduation with Honours, Dean's Honour List 2018 – 2021

RESEARCH EXPERIENCES

NASA Jet Propulsion Laboratory, California Institute of Technology

Pasadena, CA, USA

Visiting Research Scholar advised by Dr. Issa Nesnas and Dr. Saptarshi Bandyopadhyay

2023-06 – Present

*Topics: autonomy for deep space exploration; Section 347: mobility and robotic systems***Autonomous Systems Lab**, Stanford University

Stanford, CA, USA

Graduate Researcher advised by Prof. Marco Pavone and Dr. Edward Schmerling

2022-03 – Present

*Topics: (focus) foundation models and safety for robotics [Paper]; (involved) neural network uncertainty quantification, out-of-distribution detection, deep offline reinforcement learning***Interactive Perception and Robot Learning Lab**, Stanford University

Stanford, CA, USA

Graduate Researcher advised by Prof. Jeannette Bohg

2022-01 – Present

*Topics: (focus) long-horizon robot planning with learned skills [Paper, Project page, Code], task and motion planning with large language models [Paper, Project page]; (involved) deep reinforcement learning, optimization***Stanford Vision and Learning Lab**, Stanford University

Stanford, CA, USA

Graduate Researcher advised by Prof. Jiajun Wu

2021-09 – 2022-02

*Topics: neuro-symbolic propositional logic 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: learning to plan in symbolic 3D scene graphs with graph neural networks [Paper, Project page, Code]***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: depth prediction for visual SLAM [Paper], visual representation learning for self-driving control [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 understanding for scene reconstruction [Paper], road estimation and 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 of deep reinforcement learning based autonomous navigation policies [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 scenarios into 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

REFEREED CONFERENCE PAPERS

- [4] C. Agia, T. Migimatsu, J. Wu, and J. Bohg, "Stap: Sequencing task-agnostic policies," in *2023 International Conference on Robotics and Automation (ICRA)*, 2023.
- [3] C. Agia, K. M. Jatavallabhula, M. Khodeir, O. Mksik, 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*, ser. Proceedings of Machine Learning Research, vol. 164, PMLR, 2022, pp. 46–58.
- [2] 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*, ser. Proceedings of Machine Learning Research, vol. 155, PMLR, 2021, pp. 2148–2161.
- [1] 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.

REFEREED JOURNAL PAPERS

- [4] A. Elhafsi, R. Sinha, C. Agia, E. Schmerling, I. A. D Nesnas, and M. Pavone, "Semantic anomaly detection with large language models," *Special Issue: Large Language Models in Robotics, Autonomous Robots*, 2023. [Online]. Available: <https://arxiv.org/abs/2305.11307>.
- [3] K. Lin, C. Agia, T. Migimatsu, M. Pavone, and J. Bohg, "Text2motion: From natural language instructions to feasible plans," *Special Issue: Large Language Models in Robotics, Autonomous Robots*, 2023. [Online]. Available: <https://arxiv.org/abs/2303.12153>.
- [2] 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, 2023. DOI: 10.1109/TIV.2021.3099022.
- [1] 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.

REFEREED WORKSHOP PAPERS

- [2] A. Elhafsi, R. Sinha, C. Agia, E. Schmerling, I. A. D Nesnas, and M. Pavone, "Semantic anomaly detection with large language models," in *Robotics: Science and Systems Workshops (RSS)*, 2023. [Online]. Available: <https://sites.google.com/view/rss2023-safe-autonomy/accepted-papers?authuser=0>.
- [1] K. Lin, C. Agia, T. Migimatsu, M. Pavone, and J. Bohg, "Text2motion: From natural language instructions to feasible plans," in *International Conference on Robotics and Automation Workshops (ICRA)*, 2023. [Online]. Available: <https://openreview.net/pdf?id=M1yTyG5P7C1>.

INVITED TALKS

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
Embodied AI Lab, MILA. Contextual graph representations for task-driven 3d planning	2021-06

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 and Trademark Office.
- 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 and Trademark Office.

COMMUNITY SERVICE AND LEADERSHIP

Stanford AI Salon, Stanford University 2021-10 – Present
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 three driven undergraduate research students through to 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

PROFESSIONAL SERVICE

Reviewer for RSS, ICRA, IROS, RA-L, CoRL

SKILLS

Languages: (*Proficient*) Python, C/C#/C++, MATLAB, Rust, L^AT_EX, 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