Cyrus Neary

Education _____

The University of Texas at Austin <i>PhD in Computational Science, Engineering, and Mathem</i> Advisor: Ufuk Topcu Member of the Center for Autonom	September 2018 - May 2024 (Expected Graduation)aticsAustin, TXny and the Center for Scientific Machine Learning
The University of Texas at Austin <i>Master of Science in Computational Science, Engineering,</i> GPA Over 39 Credits – 4.00	September 2018 - May 2021and MathematicsAustin, TX
The University of British Columbia Bachelor of Applied Science in Engineering Physics, Mino GPA Over 177 Credits – 91.4% Co-operative Education	September 2013 - May 2018 r <i>in Honours Mathematics Vancouver, BC</i> Program Graduated with Distinction
Experience	
The University of Texas at Austin – <i>Graduate Research</i> Developing theory and algorithms to engineer scalable	<i>Assistant</i> September 2018 - Present and reliable AI systems.
MDA Systems Ltd. – <i>Mission Systems Engineering Co-</i> Developed and tested control systems for the European	Space Agency's (ESA) ExoMars rover.
MDA Systems Ltd. – Research and Development Co-op Developed and validated algorithms to improve object	May 2016 - December 2016 characterization in synthetic aperture radar images.
D-Wave Systems Inc. – <i>Processor Development Co-op</i> Designed and executed experiments to improve magnet	January 2015 - May 2015 ic shielding for the company's quantum computer.
Journal Papers	
* Indicates equal contribution	
Verifiable Reinforcement Learning Systems via Composition Cyrus Neary, Aryaman Singh Samyal, Christos Verginis, M Under revision at <i>The Journal of Artificial Intelligence Rese</i>	nality 2023 urat Cubuktepe, Ufuk Topcu arch (JAIR)
Designing Minimally-Dependent Multiagent Systems that Mustafa O. Karabag [*] , Cyrus Neary [*] , Ufuk Topcu Under revision at <i>The Journal of Autonomous Agents and I</i>	are Robust to Communication Loss 2023 Aultiagent Systems (JAAMAS)
Physics-Informed Kernel Embeddings Adam Thorpe, Cyrus Neary, Franck Djeumou, Meeko M. H Under submission to The IEEE Transactions on Automatic	2023 (. Oishi, Ufuk Topcu <i>Control (TAC)</i>

Automaton-Based Representations of Task Knowledge from Generative Language Models Yunhao Yang, Jean-Raphaël Gaglione, Cyrus Neary , Ufuk Topcu Under submission to <i>The Journal of Artificial Intelligence Research (JAIR)</i>	
Formal Methods for Autonomous Systems Tichakorn Wongpiromsarn, Mahsa Ghasemi, Murat Cubuktepe, Georgios Bakirtzis, Steven Carr, Mustafa O Karabag, Cyrus Neary , Parham Gohari, Ufuk Topcu <i>Foundations and Trends in Systems and Control</i>	2023
Multiscale Heterogeneous Optimal Lockdown Control for COVID-19 Using Geographic Information Cyrus Neary, Murat Cubuktepe, Niklas Lauffer, Xueting Jin, Alexander J. Phillips, Zhe Xu, Daoqin Tong, and Ufuk Topcu Scientific Reports	2022
Peer Reviewed Conference Papers	
* Indicates equal contribution	
A Multifidelity Sim-to-Real Pipeline for Verifiable and Compositional Reinforcement Learning Cyrus Neary, Christian Ellis, Aryaman Singh Samyal, Craig Lennon, Ufuk Topcu Under submission to <i>The IEEE International Conference on Robotics and Automation (ICRA)</i>	2023
Multimodal Pretrained Models for Sequential Decision-Making: Planning, Grounding, and Perception Yunhao Yang, Cyrus Neary , Ufuk Topcu Under submission to <i>The International Conference on Autonomous Agents and MultiAgent Systems (AAMAS)</i>	2023
Physics-Informed Kernel Embeddings: Integrating Prior System Knowledge with Data-Driven Control Adam J. Thorpe [*] , Cyrus Neary [*] , Franck Djeumou [*] , Meeko M. K. Oishi, Ufuk Topcu Under submission to <i>The American Control Conference (ACC)</i>	2023
How to Learn and Generalize From Three Minutes of Data: Physics-Constrained and Uncertainty-Aware Stochastic Differential Equations Franck Djeumou [*] , Cyrus Neary [*] , Ufuk Topcu <i>The Conference on Robot Learning (CORL) 2023</i>	Neural 2023
Compositional Learning of Dynamical System Models Using Port-Hamiltonian Neural Networks Cyrus Neary , Ufuk Topcu <i>The Learning for Dynamics and Control Conference (L4DC) 2023</i>	2023
Differential Privacy in Cooperative Multiagent Planning Bo Chen [*] , Calvin Hawkins [*] , Mustafa O. Karabag [*] , Cyrus Neary [*] , Matthew Hale, Ufuk Topcu <i>The Conference on Uncertainty in Artificial Intelligence (UAI) 2023</i>	2023
Automatic Decomposition of Reward Machines for Decentralized Multiagent Reinforcement Learning Sophia Smith, Cyrus Neary , Ufuk Topcu <i>The IEEE Conference on Decision and Control (CDC) 2023</i>	2023
Verifiable and Compositional Reinforcement Learning Systems Cyrus Neary, Christos Verginis, Murat Cubuktepe, and Ufuk Topcu The International Conference on Automated Planning and Scheduling (ICAPS) 2022	2022

Neural Networks with Physics-Informed Architectures and Constraints for Dynamical Systems Modeling Franck Djeumou [*] , Cyrus Neary [*] , Eric Goubault, Sylvie Putot, Ufuk Topcu <i>The Learning for Dynamics and Control Conference (L4DC) 2022</i>	2022
Planning Not to Talk: Multiagent Systems that are Robust to Communication Loss Mustafa O. Karabag [*] , Cyrus Neary [*] , and Ufuk Topcu <i>The International Conference on Autonomous Agents and MultiAgent Systems (AAMAS) 2022</i>	2022
Taylor-Lagrange Neural Ordinary Differential Equations: Fast Training and Evaluation of Neural ODEs Franck Djeumou [*] , Cyrus Neary [*] , Eric Goubault, Sylvie Putot, Ufuk Topcu <i>The International Joint Conference on Artificial Intelligence (IJCAI) 2022</i>	2022
Reward Machines for Cooperative Multiagent Reinforcement Learning Cyrus Neary, Zhe Xu, Bo Wu, and Ufuk Topcu The International Conference on Autonomous Agents and MultiAgent Systems (AAMAS) 2021	2021
Smooth Convex Optimization using Sub-Zeroth-Order Oracles Mustafa O. Karabag, Cyrus Neary , and Ufuk Topcu <i>The AAAI Conference on Artificial Intelligence (AAAI) 2021</i>	2021

Oral Presentations

How to Learn and Generalize From Three Minutes of Data: Physics-Constrained and Uncertai Stochastic Differential Equations The Conference on Robot Learning	nty-Aware Neural November, 2023
Incorporating Physics Knowledge into Neural Differential Equations Minisymposium on Mathematical and Computational Foundations of Predictive Digital Twins SIAM TX-LA Section Annual Meeting	November, 2023
Incorporating Physics Knowledge into Neural Differential Equations for Robot Control Texas Robotics Seminar	October, 2023
NeuroSPAR: Neuro Symbolic Perception, Action, and Reasoning DARPA Assured Neuro Symbolic Learning and Reasoning PI Meeting	October, 2023
Leveraging Physics Knowledge in Learned Dynamics Models for Reinforcement Learning and Control ONR Science of Autonomy Program Review	August, 2023
Multi-Modal, Pre-Trained Models in Verifiable Sequential Decision-Making Microsoft Applied Sciences Group Invited Talk	June, 2023
Incorporating Physics-Based Knowledge into Neural Ordinary Differential Equations ACC Workshop on Recent Developments in Data-Driven Methods for Dynamical Systems and Contr	May, 2023 rol
Leveraging Task Structure and A Priori Physics Knowledge in Reinforcement Learning University of Massachusetts Amherst, Autonomous Learning Lab Invited Talk	March, 2023
Neural ODEs with Physics-Informed Architectures and Constraints Minisymposium on Data-driven and Nonlinear Model Reduction Methods for Physical Sciences and I SIAM TX-LA Section Annual Meeting	November, 2022 Engineering

Taylor-Lagrange Neural ODEs The International Joint Conference on Artificial Intelligence	July, 2022
Verifiable and Compositional Reinforcement Learning Systems The International Conference on Automated Planning and Scheduling	June, 2022
Neural Networks with Physics-Informed Architectures and Constraints SIAM Uncertainty Quantification	April, 2022
Planning not to Talk: Multiagent Systems that are Robust to Communication Loss AFOSR Center of Excellence in Assured Autonomy in Contested Environments Program Review	April, 2022
How to Learn to Reach, Walk, Swim and Fly in One Trial DARPA Invited Talk	October, 2021
How to Learn to Reach, Walk, Swim and Fly in One Trial Texas Robotics Research Symposium	October, 2021
Reward Machines for Cooperative Multiagent Reinforcement Learning The International Conference on Autonomous Agents and Multiagent Systems	May, 2021
Poster Presentations	
Large Language Models for Verifiable Sequential Decision-Making in Autonomous Systems The 2nd Workshop on Language and Robot Learning: Language as Grounding	November, 2023
How to Learn and Generalize From Three Minutes of Data: Physics-Constrained and Uncertainty-Aware Neural Stochastic Differential Equations The Conference on Robot Learning	November, 2023
Compositional Learning of Dynamical System Models Using Port-Hamiltonian Neural Networks The Learning for Dynamics and Control Conference	June, 2023
Taylor-Lagrange Neural ODEs The International Joint Conference on Artificial Intelligence	July, 2022
Verifiable and Compositional Reinforcement Learning Systems The International Conference on Automated Planning and Scheduling	June, 2022
Neural Networks with Physics-Informed Architectures and Constraints	lune 2022

Service

Oden Institute Committee for Diversity, Equity, Inclusion, and Outreach September 2022 - August 2023 Served as the committee's graduate student representative. Contributed to a report that analyzed the results of an Oden Institute-wide climate survey and provided recommendations to the institute's leadership. Organized outreach information sessions to connect graduate students with local STEM outreach organizations.

Babuška Forum Seminar Series, Organizer

September 2022 - May 2023

Hosted a biweekly seminar series to expose PhD students to topics in computational science and engineering.

Reviewer

Engineering Applications of Artificial Intelligence

The American Control Conference	2023
IEEE International Conference on Robotics and Automation	2023
IEEE Transactions on Automatic Control	2023
IEEE Conference on Decision and Control	2023
The Learning for Dynamics and Control Conference	2023
The International Conference on Automated Planning and Scheduling	2023
IEEE Control Systems Letters	2022
IEEE Conference on Computers, Software & Applications in an Uncertain World	2022
ACM/IEEE International Conference on Cyber-Physical Systems	2021
Other Volunteering	

Student volunteer, The International Conference on Autonomous Agents and Multiagent Systems 2021

Outreach _____

Code2College Python Instructor

Teaching weekly Python courses to high school students through Code2College, an organization whose mission is to dramatically increase the number students from underserved communities in STEM undergraduate majors and careers.

Code @ TACC Summer Camp, Speaker

Presented on my journey in STEM to high school students participating in the TACC summer camp. Engaged with the students to discuss opportunities in STEM, technical projects, and college admissions.

Del Valle School District Visit Day, Speaker

Presented an overview of my current research to high school students visiting the Oden Institute from Del Valle independent school district. Led a discussion on the research process and on pursuing a career in STEM.

Fellowships, Honors, and Awards _____

Student Scholarship – International Conference on Automated Planning and Scheduling		2022
Student Scholarship – International Conference on Autonomous Agents and Multiagent	Systems	2022, 2021
National Initiative for Modeling and Simulation Graduate Research Fellowship		2019
The University of Texas at Austin Graduate Recruitment Fellowship		2018
Carl and Elsie Halterman Scholarship		2018
The University of British Columbia Dean's Honor List	2018, 2017,	2016, 2014
The University of British Columbia Trek Excellence Scholarship	2017,	2016, 2014
Captain C.Y. Wu Scholarship		2017, 2016
MDA Co-op Scholarship		2016
NSERC Industrial Undergraduate Student Research Award		2016, 2015
The University of British Columbia Chancellor's Scholar		2013

Other Technical Projects _____

Ocular Torsion Quantification – UBC Kinesiology

August 2022

September 2022 - Present

March 2022

Worked with two other UBC students to develop a computer algorithm to measure eye torsion from video recordings. This algorithm is of specific interest to researchers in UBC's Sensorimotor Physiology Laboratory.

- **UAS Flight Navigation and Collision Avoidance** *Aeriosense Technologies* September 2016 May 2017 Developed an autonomous unmanned aircraft system with two other UBC students. The system used stereo cameras and onboard processing to navigate and avoid collisions with obstacles.
- **Electrical Engineering Team Leader** *Formula UBC Engineering Team* September 2013 September 2017 Mentored teammates, assigned sub-projects, and set the team's project schedule. Responsible for the design and fabrication of power distribution, data acquisition, and electronic actuation systems onboard the racecar. The team creates a new car annually to compete in the international Formula SAE competition.

Autonomous Robot Competition – UBC Engineering PhysicsMay 2015 - August 2015

Worked with three other UBC Engineering Physics students to design, prototype, and test a fully autonomous robot that competed in the 2015 UBC Engineering Physics robot competition.