

Branton DeMoss

Summary	Interested in the intersection of classical planning with deep-learning based world modeling to build autonomous agents that can think ahead to act in the world.	
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Education	<i>DPhil Candidate in Artificial Intelligence</i>	2021-
	University of Oxford	
	<i>BA Mathematics and Physics</i>	2014-18
	University of Colorado Boulder	
Experience	Oxford Robotics Institute	2021-
	<i>Graduate Student Researcher</i> <ul style="list-style-type: none">• Research in reinforcement learning, world modeling, and planning.	
	The Collaboratory	2020-
	<i>Co-founder; Chief Science Officer</i> <ul style="list-style-type: none">• Developed deep-learning based document embedder based on language and graph structure, and related algorithms for knowledge curation.• Led product strategy, ML R&D, and customer-informed design.• Admitted to Techstars class of 2021 (< 1% applicants admitted)	
	Comma.ai	2020
	<i>ML Research Intern</i> <ul style="list-style-type: none">• Extended vision module architecture and ported recurrent neural network for driving policy from Tensorflow to PyTorch.• Studied effects of new stochastic dynamics model on driving policy quality.	
	Front Range Geosciences	2017-20
	<i>Research Scientist</i> <ul style="list-style-type: none">• Developed convolutional neural network (CNN) to detect seismic first break events. System in production at multinational seismic exploration corporations.• Incorporated differentiable Gaussian mixture models in deep learning system to model energy-time uncertainty in wavelet arrival.• Developed Generative Adversarial Network (GAN) to pre-train CNN when supervisory targets unavailable.• Wrote eikonal wave equation propagator (C++) for psuedo-structured 3D meshes for tomographic seismic imaging.	
	Center for Theory of Quantum Matter	2017
	<i>Research Assistant</i> <ul style="list-style-type: none">• Characterized quantum many-body localization (MBL) under Floquet conditions.	
	Mathematics Department, CU Boulder	2016
	<i>Research Assistant</i>	

- Investigated knot-theoretic properties of topological quantum field theories.

High Energy Particle Physics Group, Physics Department, CU Boulder 2014-15
Research Assistant

- Characterized effects of beamline material geometry on particle correlation statistics for the Deep Underground Neutrino Experiment (DUNE).

Publications	<i>Combining physics and deep learning to automatically pick first breaks in the Permian Basin</i>	2021
	First International Meeting for Applied Geoscience & Energy	
	<i>Ein Liebesbrief an KataGo</i>	2020
	Deutsche Go Zeitung, Ausgabe 4/2020	
	<i>Love Letter to KataGo, or: Go AI Past, Present, and Future</i>	2020
	American Go E-Journal	
	<i>DeepTrace: A breakthrough application of deep learning to automate first break picking</i>	2019
	SEG 2019 Lenovo Thought Leadership Series	
	<i>Topology and Knot Theory</i>	2016
	Course notes for CU Boulder special topics course: <i>“Topology, Knot Theory, and their applications in Physics and Chemistry”</i>	
	<i>Secondary Particle Showers from Hadron Absorber Interactions</i>	2016
	Long Baseline Neutrino Facility (LBNF) / Deep Underground Neutrino Experiment (DUNE) Collaboration Documents	
Awards	<i>Research Studentship</i>	Oxford, 2021
	<i>Stribic-Martin Scholarship</i>	Boulder, 2017
	<i>UROP Fellowship</i>	Boulder, 2017
	<i>Dawkins Fund Award</i>	Oxford, 2016
	<i>Gilman Scholarship</i>	Oxford, 2016
	<i>Esteemed Scholar Award</i>	Boulder, 2014