Benjamin A. Christie

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EDUCATION

Ph.D. Candidate, Mechanical Engineering — May 2027 (Anticipated)
Safe Personalized Robots Across Physical and Semantic Interactions — GPA: 3.77/4.0
Virginia Tech, Blacksburg, VA · Advisor: Dr. Dylan P. Losey

M.S. in Mechanical Engineering — May 2024
Adaptive Communication Interfaces for Human-Robot Collaboration — GPA: 3.77/4.0
Virginia Tech, Blacksburg, VA · Advisor: Dr. Dylan P. Losey

B.S. in Mechanical Engineering, Minor in Computer Science — May 2022
Vacuum Compliant 6-DoF Robotic Manipulator — GPA: 3.59/4.0
Virginia Tech, Blacksburg, VA · Specialization: Robotics and Mechatronics

Associate's Degree — May 2018
Germanna Community College, Fredericksburg, VA — GPA: 4.0/4.0

RESEARCH EXPERIENCE

Graduate Research Assistant (DoD SMART Scholar) — Aug 2022 – Present
Collaborative Robotics Lab, Virginia Tech, Blacksburg, VA · Advisor: Dr. Dylan P. Losey
Selected projects: see Journal Articles and Conference Papers

Mechanical Engineer — Jun 2021 – Present
U.S. Army ERDC, Information Technology Laboratory (ITL), Sensors Integration Branch
Supervisors: Amie Burroughs, Dr. Anton Netchaev, & Althea Henslee
Selected projects (*performed in tandem with M.S./Ph.D. research*):

- **PRISM**: Autonomous and intelligent robotic inspection of Civil Works structures
- **WAAM**: Designed, trained, and tested a classifier for in-situ anomaly detection
- **REO**: Designed and implemented a VLA on an autonomous earthmoving bulldozer platform
- **DamBot**: Designed and implemented motion planners for the largest robotic arm in the USACE
- **MOWLES**: Low SWaP-C autonomous UGV for GPS-denied exploration in ODVE

Mechanical Engineering Intern — May 2019 – Jul 2021
U.S. Army ERDC, Geospatial Research Laboratory (GRL), Alexandria, VA
Supervisors: Vineet Gupta & Dr. Garry Glaspell

TEACHING & TUTORING

Undergraduate Teaching Assistant (*Intro. to Engineering; Multivariable Calculus*) — Feb 2019 – Aug 2020
Virginia Tech, Blacksburg, VA

Mathematics and Writing Tutor — Aug 2017 – Aug 2018
Academic Center for Excellence, Germanna Community College, Fredericksburg, VA

INTERESTS

Neuro-Symbolic Policies, Robot Learning, Autonomous Systems, Personalization, Safety, HRI, Human-Robot Teams, UEE

JOURNAL ARTICLES

[J5] **B. A. Christie**, S. Parekh, and D. P. Losey, "Fine-Tuning Robot Policies While Maintaining User Privacy," *IEEE Robotics and Automation Letters* (*RA-L*), 2026, under review.

[J4] Y. Dai, **B. A. Christie**, D. E. Evans, D. P. Losey, and S. Stepputis, "Language Movement Primitives: Grounding Language Models in Robot Motion," *IEEE Transactions on Robot Learning*, 2026, under review.

[J3] **B. A. Christie** and D. P. Losey, "Safe Interaction via Monte Carlo Linear-Quadratic Games," *ACM Transactions on Human-Robot Interaction* (*THRI*), 2025, under review. arXiv: 2504.06124.

[J2] A. Alvarez Valdivia, **B. A. Christie**, D. P. Losey, and L. H. Blumenschein, "A Modular Haptic Display with Reconfigurable Signals for Personalized Information Transfer," *IEEE Transactions on Haptics* (*ToH*), 2025. arXiv: 2506.05648.

[J1] **B. A. Christie** and D. P. Losey, "LIMIT: Learning Interfaces to Maximize Information Transfer," *ACM Transactions on Human-Robot Interaction (THRI)*, vol. 13, no. 4, pp. 1–26, 2024. DOI: 10.1145/3675758

CONFERENCE PAPERS

[C8] T. M. Belmont, **B. A. Christie**, and A. Netchaev, "Dispersion-Bounded Trajectory Optimization via Many-RRT*," in *IEEE International Conference on Robotics and Automation (ICRA)*, 2027, under review.

[C7] **B. A. Christie**, S. Jain, and D. P. Losey, "Show and Tell: Unifying Physical Demonstrations and Language Corrections for Neuro-Symbolic Robots," in *IEEE International Conference on Robotics and Automation (ICRA)*, 2027, under review.

[C6] **B. A. Christie**, Y. Dai, M. Bararjanianbahnamiri, S. Stepputis, and D. P. Losey, "From Local Corrections to Generalized Skills: Improving Neuro-Symbolic Policies with MEMO," in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2026.

[C5] T. M. Belmont and **B. A. Christie**, "Online Manipulator Collision Avoidance Using SOTA Sensing Capabilities," in *ERDC-ITL Symposium*, 2025.

[C4] **B. A. Christie** and T. M. Belmont, "Monte-Carlo Sphere Generation for Collision Detection in Manipulators," in *ERDC-ITL Symposium*, 2025.

[C3] **B. A. Christie**, H. S. Nemlekar, and D. P. Losey, "Personalizing Interfaces to Humans with User-Friendly Priors," in *IEEE International Conference on Robotics and Automation (ICRA)*, 2025, pp. 7370–7376. arXiv: 2403.07192.

[C2] J. Hoegerman, S. Sagheb, **B. A. Christie**, and D. P. Losey, "Aligning Learning with Communication in Shared Autonomy," in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024. arXiv: 2403.12023.

[C1] S. Sagheb, Y.-J. Mun, N. Ahmadian, **B. A. Christie**, A. Bajcsy, K. Driggs-Campbell, and D. P. Losey, "Towards Robots that Influence Humans over Long-Term Interaction," in *IEEE International Conference on Robotics and Automation (ICRA)*, 2023. DOI: 10.1109/ICRA48891.2023.10160321

TECHNICAL REPORTS

[T6] **B. A. Christie**, C. Alred, M. Paquette, and G. P. Glaspell, "Increasing the Degrees of Freedom on a Robot Arm," U.S. Army ERDC, Tech. Rep., 2023. DOI: 10.21079/11681/47846

[T5] **B. A. Christie**, J. D. Klein, A. D. Netchaev, and G. P. Glaspell, "Integrating MoveIt Motion Constraints on a Novel Robotic Manipulator," U.S. Army ERDC, Tech. Rep., 2023. DOI: 10.21079/11681/47845

[T4] B. Mekonnen, **B. A. Christie**, M. Paquette, and G. P. Glaspell, "3D Mapping and Navigation Using MoveIt," U.S. Army ERDC, Tech. Rep., 2023. DOI: 10.21079/11681/47179

[T3] **B. A. Christie**, O. Ennasr, and G. P. Glaspell, "Autonomous Navigation and Mapping in a Simulated Environment," U.S. Army ERDC-GRL, Tech. Rep., 2021. DOI: 10.21079/11681/42006

[T2] **B. A. Christie**, O. Ennasr, and G. P. Glaspell, "ROS-Integrated Object Detection for SLAM in Unknown, Low-Visibility Environments," U.S. Army ERDC-GRL, Tech. Rep., 2021. DOI: 10.21079/11681/42385

[T1] G. P. Glaspell, S. Lessard, **B. A. Christie**, et al., "Optimized Low Size, Weight, Power and Cost (SWaP-C) Payload for Mapping Interiors and Subterranean on an Unmanned Ground Vehicle," U.S. Army ERDC-GRL, Tech. Rep., 2020. DOI: 10.21079/11681/35878

PRESENTATIONS

- *The End of End-to-End? Harnessing Neuro-Symbolic Policies for Manipulation* — VRS, 2026
- *From Local Corrections to Generalized Skills: Improving Neuro-Symbolic Policies with MEMO* — IROS, 2026
- *Safe Personalized Robots Across Physical and Semantic Interactions (Ph.D. Oral Exam)* — Virginia Tech, 2026
- *Privately Personalizing Robot Policies* — VRS, 2025
- *Monte-Carlo Sphere Generation for Collision Detection in Manipulators* — ERDC-ITL, 2025
- *Personalizing Interfaces to Humans with User-Friendly Priors* — ICRA, 2025
- *Adaptive Communication Interfaces for Human-Robot Collaboration (Oral Exam)* — Virginia Tech, 2024
- *Autonomous Inspection and Exploration with SLAM-Enabled Robotic Manipulators* — ERDC-ITL, 2023
- *Autonomous Inspection of Civil Structures* — ERDC-GRL & ERDC-ITL, 2022
- *Vacuum Compliant 6-DoF Robotic Manipulator* — Northrop Grumman & Virginia Tech, 2022
- *Object Detection and Tracking in Darkness and Fog* — ERDC-GRL, 2021
- *Bounded UEE with Emergency Fail-Safes* — ERDC-GRL, 2020
- *Unknown Environment Exploration with Low SWaP-C UGVs* — ERDC-GRL, 2019

AWARDS & HONORS

- DoD SMART Scholarship: USACE-ERDC (ITL & GRL) and Virginia Tech
- Alfa Laval Thermal Inc. Scholarship
- Benjamin Squire '48 Memorial Scholarship
- Frederick C. Grant Scholarship
- Benjamin & Hilda Partlow Scholarship
- Commonwealth Award Scholarship
- John M. Scrugg Memorial Scholarship
- Virginia Tech Award Scholarship ($\times 3$)
- VCCS Award for Excellence in Physics

TECHNOLOGY SUMMARY

- **Languages**: CUDA, C++, Python, MATLAB, Go, Angular2, {ba,z,fi}sh, Lua
- **Systems/Libraries**: Linux, PyTorch, MoveIt, ROS{1,2}, Ollama, Docker, and everything in-between
- **Domains**: Robot Learning, HRI, {Imitation, Preference, Reinforcement} Learning, VLMs, VLAs, TAMP, SLAM, Controls