CARL LOUIS MUELLER

CS PhD Student / Roboticist

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SUMMARY

- PhD student at the University of Colorado Boulder in the Collaborative Artificial Intelligence and Robotics Laboratory (CAIRO) under the advisement of Professor Bradley Hayes.
- Published researcher with expertise in machine learning, AI, robotics, and software engineering.
- Former Director of Portfolio at the Deming Center Venture Fund, a student run venture capital fund.
- Co-founded a small tech company that cultivated a variety of consulting and contracting experiences.

EDUCATION

University of Colorado - Boulder 9/2017 – Present
- PhD Computer Science

Santa Barbara City College 9/2012 – 12/2015
- Post-Baccalaureate coursework

University of California, Santa Barbara Graduated 4/2011
- B.S. Biopsychology

RESEARCH FOCI

Robot Learning from Demonstration
- Develop algorithms and systems that enable robotic systems to learn from human counterparts during collaborative tasks in order to create generalized plans for future autonomous behavior.

Constrained Robotic Learning Systems
- Use abstract constraints to enhance the learning capacity of robotics systems and to provide guarantees of safe behavior through development of constrained motion planning & LfD algorithms.

Human-Robot Interfaces for Learning from Demonstration
- Design and evaluate interfaces that best enable human operators to effectively and intuitively communicate important information about tasks demonstrated to a robotic learning system.

PUBLICATIONS

Graduate Publications:
- Mueller, Carl L., and Bradley Hayes. "Safe and Robust Robot Learning from Demonstration through Conceptual Constraints." *Companion of the 2020 ACM/IEEE International Conference on Human-Robot Interaction.* 2020.
- C. Mueller, “Abstract Constraints for Safe and Robust Robot Learning from Demonstration,” *Proceedings of the AAAI Conference on Artificial Intelligence,* New York City, New York, 2020

- C. Mueller, J. Venicx, and B. Hayes, “Robust robot learning from demonstration and skill repair using conceptual constraints,” IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018.

CONSORTIUMS, PRESENTATIONS & TALKS

- Twenty-Fifth AAAI/SIGAI Doctoral Consortium, 2020, New York City, New York
- 2019 CU Boulder Aerospace Ventures Research Blitz Speaker
- 2018 TedX Mile High Adventure Interactive Presentation

AWARDS & HONORS

- 2018/2019 Outstanding PhD Researcher Department Award

ACADEMIC SERVICE, MEMBERSHIP, & OUTREACH

Conference and Journal Review

- THRI
- HRI
- ICRA
- IROS

Professional Membership

- IEEE
- ACM
- Deming Center Venture Fund

Community Outreach

- 2018 TedX Mile High Adventure

ACADEMIC ADVISEMENT

Graduate

- Ashwin Sankaralingam, M.S. 9/1/2018 – 12/15/2018

Undergraduate

- Micah Zhang, B.S. 2/1/2019 – 12/12/2019

EMPLOYMENT HISTORY

Circadence Corporation *Boulder, Colorado*
Software Contracting / Consulting 6/2019 – 10/31/2019

Lightning in a Bot, Inc. *Los Angeles, California*
Co-Founder / CTO 8/2015 - 9/2017

Independent Employment *Santa Barbara, California*

Software Contract / Consulting 4/2017 – 9/2017

QualTek Molecular Laboratories *Santa Barbara, California*
Research Scientist / Project Manager 1/2013 – 7/2014

Research Assistant / Sample Manager 4/2011 – 1/2013

TECHNICAL SKILLS

Software Engineering

- Professional in software design, coding principles, and documentation best practices.
- Designed a large-scale PostgreSQL backend to support on-demand analytics.
- Built Django, Flask, and Node.js web backends to support a custom in-house NLP engine.

Platforms and Frameworks

- Experience with a variety of cloud platforms such as MongoDB, PostgreSQL, Heroku, Amazon EC2, S3, RDS, Elastic Beanstalk, & Lambda.
- Production-level implementation of machine learning platforms such as Scikit-Learn.
- Built robot learning from demonstration and motion planning software package for CAIRO lab.

Robotics

- Well-versed in ROS and MoveIt! frameworks.
- Published researcher in robotic Learning from Demonstration with expertise in trajectory modeling, motion planning optimization, task planning, and human-robot interfaces.
- Knowledgeable in human-centered design as well as conducting human-computer interaction studies.

Machine Learning / Data Analytics

- Performed statistical analysis and data exploration for research applications and industrial reporting.
- Domain expert in machine learning and AI including classification, clustering, probabilistic modeling, graphical models, deep learning, decision making under uncertainty, planning, and modern NLP.

EXTRACURRICULARS

Deming Center Venture Fund - Portfolio Manager

- Accredited venture capital firm run by graduate students within the CU Boulder business school.

Racer X Cycling / Colorado Bike Law Team Member

- Amateur mountain bike and cyclocross racer.
- Volunteer at local events in the greater Denver area