Christine Allen-Blanchette

http://cablanc.github.io :: ca15@princeton.edu

RESEARCH INTERESTS

Deep learning, geometry, & physical systems

PROFESSIONAL APPOINTMENTS

Princeton University — Princeton, NJ
Assistant Professor, Mechanical and Aerospace Engineering & Center for Statistics and Machine Learning — *July 2022 - Present*
Postdoctoral Researcher, Mechanical and Aerospace Engineering — *August 2019 - July 2022*
Presidential Postdoctoral Research Fellow

Machine Learning for Political Economy and Race Lab
Co-Founder and Scientific Advisor — *2020 - Present*

EDUCATION

University of Pennsylvania — Philadelphia, PA
Ph.D., Computer Information Science — *Spring 2020*
M.S.E, Robotics — *May 2013*
Dissertation: Leveraging Symmetric Structure for Improved Learning in Convolutional Neural Networks
Advisor: Prof. Kostas Daniilidis
NSF IGERT Complex Scene Perception Fellow
Distinguished Fontaine Fellow
GEM Fellow

San Jose State University — San Jose, CA
B.S. Computer Engineering — *August 2011*
B.S. Mechanical Engineering — *August 2011*
David A. Brown Mechatronics Fellow

PUBLICATIONS

J. Mason, **C. Allen-Blanchette**, N.F. Zolman, E. Davison, N.E. Leonard, *Learning interpretable dynamics from images of a freely rotating 3D rigid body*, AAAI, 2022 Symposium on Knowledge-Guided AI

C. Allen-Blanchette, S. Veer, A. Majumdar, N.E. Leonard, *LagNetViP: A Lagrangian Neural Network for Video Prediction*, AAAI, 2020 Symposium on Physics-Guided AI

C. Esteves, Y. Xu, **C. Allen-Blanchette**, K. Daniilidis, *Equivariant Multi-View Networks*, ICCV, 2019 (**Oral**)

C. Esteves, **C. Allen-Blanchette**, A. Makadia, K. Daniilidis, *Learning SO(3) Equivariant Representations with Spherical CNNs*, ECCV, 2018 (**Oral**)

C. Esteves, **C. Allen-Blanchette**, X. Zhou, K. Daniilidis, *Polar Transformer Networks*, ICLR, 2018

S. Leonardos, **C. Allen-Blanchette**, J. Gallier, *The exponential map for the group of similarity transformations and applications to motion interpolation*, ICRA, 2015

In Submission

J. Mason, **C. Allen-Blanchette**, N.F. Zolman, E. Davison, N.E. Leonard, Learning interpretable dynamics from images of a freely rotating 3D rigid body

In Preparation

C. Allen-Blanchette, D. Patino Cortes, K. Daniilidis, *SO(3) Equivariance with 2D Translational CNNs*

C. Allen-Blanchette, P. Posey, *Unequal Exposures: An Application of Convolutional Neural Networks to Predict Neighborhood Physical and Social Characteristics*

PATENTS

M. Rodnick, and **C. Allen-Blanchette**, Systems and methods for dynamic alignment beam calibration, U.S. Patent No. 9,269,529, 23 Feb. 2016

M. Rodnick, and **C. Allen-Blanchette**, Systems and methods for calibrating end effector alignment using at least a light source, U.S. Patent No. 8,954,287, 10 Feb. 2015

M. Rodnick, and **C. Allen-Blanchette**, Systems and methods for calibrating end effector alignment in a plasma processing system, U.S. Patent No. 8,751,047, 10 Jun. 2014

M. Rodnick, and **C. Allen-Blanchette**, Arrangements and methods for determining positions and offsets, U.S. Patent No. 8,860,955, 14 Oct. 2014

AWARDS & FELLOWSHIPS

2020-21	Council on Science and Technology (CST) Award, Princeton University
2019-Present	Presidential Postdoctoral Research Fellows, Princeton University
2019-21	Provost Postdoctoral Fellow, University of Pennsylvania, (declined offer)
2012-19	Fontaine Fellowship, University of Pennsylvania
2016	FOCUS Fellows, Georgia Institute of Technology
2015	NextProf Future Faculty Workshop, University of Michigan
2012-14	NSF IGERT Complex Scene Perception Fellowship, University of Pennsylvania
2012	GEM Fellowship, University of Pennsylvania
2010	Summer Undergraduate Research Fellowship, Georgia Institute of Technology
2007	David A. Brown Fellowship in Mechatronics, San Jose State University

INVITED TALKS

2022	Boston University - Center for Information & Systems Engineering (CISE)
2021	Center for Advanced Signal and Image Sciences (CASIS)
2021	University of Pennsylvania - Matni Lab
2020	UC Berkeley - SemiAutonomous Seminar
2020	Workshop on Equivariance and Data Augmentation
2020	University of Florida - Nonlinear Controls and Robotics Seminar
2020	University of Pennsylvania - Kod*lab
2020	Princeton University
2018	University of Pennsylvania - Kod*lab

PRESENTATIONS

2020	*LagNet: Lagrangian Neural Networks*, Princeton Neuroscience Institute
2020	*LagNet: Lagrangian Neural Networks*, Princeton University
2018	*3D Object Classification*, NSF-IUCRC ROSE-HUB, Minneapolis, MN
2017	*Equivariant networks*, NSF-IUCRC ROSE-HUB, Denver, CO
2014	*Motion Interpolation in SIM(3)*, GEM Annual Board Meeting and Conference, San Diego, CA

TEACHING EXPERIENCE

Princeton University
Special Topics: Deep Learning and Physical Systems, *Instructor* (Spring 2021)
Reading Seminar: Machine Learning and Dynamical Systems - Reinforcement Learning, *Instructor* (Fall 2020)
Reading Seminar: Machine Learning and Dynamical Systems - Graph Neural Networks, *Instructor* (Summer 2020)

University of Pennsylvania
Machine Perception (graduate course), *Teaching Assistant* (Spring 2018)
Course in College Teaching, *Trainee* (Spring 2017)
edX Robotics: Vision Intelligence and Machine Learning, *Teaching Assistant - Course Developer* (Summer 2017)
Research Experience for Teachers (RET) - Linear Algebra, *Instructor* (Summer 2016)
Computer Organization and Design (undergraduate course), *Teaching Assistant* (Spring 2014)
Introduction to Cognitive Science (undergraduate course), *Teaching Assistant*, (Fall 2013)

San Jose State University
Robotics, *Teaching Assistant - Curriculum Design* (AY 2007-08, Summer 2007, Spring 2007)
Robotics, *Teaching Assistant - Course Developer* (Summer 2006)

RESEARCH EXPERIENCE

University of Pennsylvania — Philadelphia, PA
Graduate Researcher, GRASP Laboratory — *September 2012 - Present*

Georgia Institute of Technology — Atlanta, GA
Undergraduate Researcher, HumAnS Lab — *May 2010 - July 2010*

SERVICE TO PROFESSION

Workshop organizer

2022 - Learning Dynamical Systems by Preserving Symmetries, Energies, and Variational Principles, SIAM Conference on Mathematics of Data Science
2021 - Robust Deep Learning-Based Control, Conference on Decision and Control (CDC)

Reviewer
International Conference on Machine Learning (ICML)
Conference on Computer Vision and Pattern Recognition (CVPR)
International Conference on Learning Representations (ICLR)
European Conference on Computer Vision (ECCV), *High-quality Review Award 2020*
Conference on Neural Information Processing Systems (NeurIPS)
Winter Conference on Applications of Computer Vision (WACV)
Asian Conference on Computer Vision (ACCV)

UNIVERSITY SERVICE

2022 AY CSML UG Certificate Executive Committee

OUTREACH

Summer 2022	UK NACME Google Applied Machine Learning Intensive (AMLI) Bootcamp, *Instructor*
Summer 2021	UK NACME Google Applied Machine Learning Intensive (AMLI) Bootcamp, *Instructor*
2018	AMP GEM GRAD Lab, *Why Graduate School? - Panelist*, April 6
2017	Data for Black Lives Conference, *Ask a Data Scientist - Panelist*, November 17-19
2017	DataRescue Philly, *Seeder/Sorter*, January 14
Summer 2016	Research Experience for Teachers (RET), *Mentor*
Spring 2015	iPraxis, *Coding Scienteer*
Fall 2014	West Philly Tutoring Project (WPTP), *Math Tutor (4th grade)*
2011	Google Hack212: Urban Innovation, *Hacker*, November 5-7

PROFESSIONAL EXPERIENCE

BAE Systems — Santa Clara, CA
Software Engineering Intern — *June 2009 - April 2010*
Developed software emulators for vehicle components

Lam Research — Fremont, CA
Mechatronics Intern — *July 2007 - August 2008*
Developed techniques for improved silicon wafer centering

PROFESSIONAL MEMBERSHIPS

2020	Black Postdoctoral Association
2020	Institute of Electrical and Electronics Engineers (IEEE)
2012	Fontaine Society
2012	Society of Women Engineers (SWE)
2012	National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM)
2008	Tau Beta Pi Honor Society, San Jose State University
2006	National Society of Black Engineers (NSBE)
2006	Pi Tau Sigma Honor Society, San Jose State University

ACTIVITIES

University of Pennsylvania Women's Ice Hockey, *Alum*