

RESEARCH INTERESTS

Deep learning, geometry, physical systems & probabilistic graphical models

PROFESSIONAL APPOINTMENTS

Princeton University

Postdoctoral Researcher, [Mechanical and Aerospace Engineering](#)
Presidential Postdoctoral Research Fellow

Princeton, NJ
August 2019 - Present

Machine Learning for Political Economy and Race Lab

Co-Founder and Scientific Advisor

2020 - Present

EDUCATION

University of Pennsylvania

Ph.D., [Computer Information Science](#)
M.S.E, [Robotics](#)

Philadelphia, PA
Spring 2020
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

B.S. Computer Engineering
B.S. Mechanical Engineering
David A. Brown Mechatronics Fellow

San Jose, CA
August 2011
August 2011

PUBLICATIONS

C. Allen-Blanchette, S. Veer, A. Majumdar, N. 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

C. Allen-Blanchette, K. Daniilidis, [Joint Estimation of Image Representations and their Lie Invariants](#), TPAMI

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](#)
K. Schwerzmann, **C. Allen-Blanchette**, J. Gallion, [Prior Understandings: Algorithms and the Justice System](#)

PATENTS

(WO2009086109) Systems and Methods for Dynamic Alignment Beam Calibration

A method for performing DA (Dynamic Alignment) beam calibration in a plasma processing system is provided.

(US8751047B2) Systems and Methods for Calibrating End Effector Alignment in a Plasma Processing System

A method for calibrating alignment of an end effector with respect to a chuck in a plasma processing system is provided.

(WO2009086164) Systems and Methods for Calibrating End Effector Alignment Using at Least a Light Source

A method for calibrating alignment of an end effector with respect to a chuck in a plasma processing system is provided.

(WO2009086042) Arrangements and Methods for Determining Positions and Offsets

A method for determining positions and offsets in a plasma processing system, the plasma processing system including at least a chuck and an upper electrode is provided.

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

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

Graduate Researcher, [GRASP Laboratory](#)

Philadelphia, PA
September 2012 - Present

Georgia Institute of Technology

Undergraduate Researcher, [HumAnS Lab](#)

Atlanta, GA
May 2010 - July 2010

SERVICE TO PROFESSION

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)

OUTREACH

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 Scientist*
Fall 2014 [West Philly Tutoring Project \(WPTP\)](#), *Math Tutor (4th grade)*
2011 Google Hack212: Urban Innovation, *Hacker*, November 5-7

PROFESSIONAL EXPERIENCE

BAE Systems

Software Engineering Intern

Developed software emulators for vehicle components

Santa Clara, CA
June 2009 - April 2010

Lam Research

Mechatronics Intern

Developed techniques for improved silicon wafer centering

Fremont, CA
July 2007 - August 2008

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 Womens Ice Hockey, *Alum*