

## RESEARCH INTERESTS

Deep learning, geometry, dynamical systems & probabilistic graphical models

## ACADEMIC APPOINTMENTS

### Princeton University

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

Princeton, NJ  
August 2020 - Present

## EDUCATION

### University of Pennsylvania

Ph.D., [Computer and 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 Fellowship*

*Distinguished Fontaine Fellow*

*GEM Fellow*

### San Jose State University

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

San Jose, CA  
August 2011  
August 2011

## PUBLICATIONS

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](#), IEEE ICRA, 2015

## Publications In Preparation

C. Allen-Blanchette, S. Veer, A. Majumdar, N. Leonard, *LagNet: Lagrangian Neural Network*

C. Allen-Blanchette, K. Daniilidis, *Joint Estimation of Image Representations and their Lie Invariants*

P. Posey, C. Allen-Blanchette, *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*

## AWARDS & FELLOWSHIPS

[Presidential Postdoctoral Research Fellows](#), Princeton University, 2019-Present

[Provost Postdoctoral Fellow](#), University of Pennsylvania, 2019 (declined offer)

[Fontaine Fellowship](#), University of Pennsylvania, 2012-2019

[FOCUS Fellows](#), Georgia Institute of Technology, 2016

[NextProf Future Faculty Workshop](#), University of Michigan, 2015

[NSF IGERT Complex Scene Perception Fellowship](#), University of Pennsylvania, 2012-2014

[GEM Fellowship](#), University of Pennsylvania, 2012

[Summer Undergraduate Research Fellowship](#), Georgia Institute of Technology, 2010

[Tau Beta Pi Honor Society](#), San Jose State University, 2008

[David A. Brown Fellowship in Mechatronics](#), San Jose State University, 2007

[Pi Tau Sigma Honor Society](#), San Jose State University, 2006

## 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.*

## PRESENTATIONS

“LagNet: Lagrangian Neural Networks”, *Princeton University*, Princeton, NJ April 6, 2020

“Equivariant Filtering in CNNs”, *Princeton University*, Princeton, NJ January 31, 2020

“Design and Use of Equivariant Filters in CNNs”, *University of Pennsylvania, Kod\*lab*, Philadelphia, PA, June 26, 2018

“3D Object Classification”, *NSF-IUCRC ROSE-HUB*, Minneapolis, MN, April 26-27, 2018

“Equivariant networks”, *NSF-IUCRC ROSE-HUB*, Denver, CO, November 16-17, 2017

“Motion Interpolation in SIM(3)”, *GEM Annual Board Meeting and Conference*, San Diego, CA, August 13-15, 2014

## RESEARCH EXPERIENCE

### **University of Pennsylvania**

*Graduate Researcher, GRASP Laboratory*

Philadelphia, PA

June 2012 - August 2020

### **Georgia Institute of Technology**

*Undergraduate Researcher, HumAnS Lab*

Atlanta, GA

May - July 2010

## 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

### **San Jose State University**

*Robotics Course - Curriculum Designer, Mechatronics Lab*

San Jose, CA

February 2007 - January 2008

### **San Jose State University**

*Robotics Course - Software Developer, Mechatronics Lab*

San Jose, CA

June - August 2006

## TEACHING EXPERIENCE

### **University of Pennsylvania**

Teaching Assistant, *CIS 580: Machine Perception*, Spring 2018

Trainee, *Course in College Teaching*, Spring 2017

Course Developer and Teaching Assistant, *edX Robotics: Vision Intelligence and Machine Learning*, Summer 2017

Lecturer, *Research Experience for Teachers (RET) - Linear Algebra*, Summer 2016

Teaching Assistant, *CIS 371: Computer Organization and Design*, Spring 2014

Teaching Assistant, *COGS001: Introduction to Cognitive Science*, Fall 2013

## OUTREACH

[AMP GEM GRAD Lab](#), *Why Graduate School?* - Panelist, April 6, 2018  
[Data for Black Lives Conference](#), *Ask a Data Scientist* - Panelist, November 17-19, 2017  
DataRescue Philly, *Seeder/Sorter*, January 14, 2017  
[Research Experience for Teachers \(RET\)](#), *Mentor*, Summer 2016  
[iPraxis](#), *Coding Scienteer*, January 2015 - May 2015  
[West Philly Tutoring Project \(WPTP\)](#), *Math Tutor (4th grade)*, September 2014 - December 2014  
Google Hack212: Urban Innovation, *Hacker*, November 5-7, 2011

## ACTIVITIES

Fontaine Society, *Alum*  
National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM), *Alum*  
National Society of Black Engineers (NSBE), *Alum*  
Society of Women Engineers (SWE), *Alum*  
University of Pennsylvania Womens Ice Hockey, *Alum*