

RESEARCH INTERESTS Computer vision and machine learning, in particular the reconciliation of visual structure with end-to-end learning.

I like to preserve classic ideas, then make them differentiable. I am convinced that reproducible research done right is extensible research, so I develop open tools for do-it-yourself science.

EDUCATION **University of California, Berkeley** · Fall 2012 - Spring 2019 (*Expected*)

Ph.D. Computer Science

Advisor: Trevor Darrell

Courses: Statistical Learning, Convex Optimization, Visual Recognition, Reinforcement Learning, Computational Neuroscience, Parallel Systems, Human-Robot Interaction, Deep Learning

University of Massachusetts Amherst (Commonwealth College) · Fall 2008 - Spring 2012

B.S. Computer Science (AI concentration) & B.S. Psychology with Departmental and Commonwealth Honors

Advisor: Erik Learned-Miller

Graduate Courses: Probabilistic Graphical Models, Information Theory, Computer Vision, Mathematical Modeling for Psychology

RESEARCH EXPERIENCE **University of California, Berkeley**

Graduate Student Researcher

September 2012 - Present

Thesis work on the end-to-end learning of image-to-image tasks, in particular the design and analysis of multi-layer, multi-scale models for local recognition. Lead developer of Caffe, the open-source deep learning framework (caffe.berkeleyvision.org). Developed auxiliary losses to augment the supervisory signal for reinforcement learning.

Facebook AI Research, Seattle

Intern Researcher

July - October 2018

Visual recognition research supervised by Ross Girshick.

DeepMind, London

Intern Researcher

June - September 2017

Deep reinforcement learning research supervised by Max Jaderberg.

OpenAI, San Francisco

Intern Researcher

September 2016 - May 2017

Reinforcement learning research and engineering supervised by John Schulman. (20% time.)

University of Massachusetts Amherst - Computer Science

Undergraduate Researcher

June 2010 - May 2012

Worked with Prof. Erik Learned-Miller in the Computer Vision lab on the distribution field descriptor, alignment for scene text understanding, and crowdsourced annotation of facial pose.

University of Massachusetts Amherst - Psychology

Research Assistant

August 2009 - December 2010

Worked with Prof. Lisa Sanders in the NeuroCognition of Action & Perception lab on brainwave data processing, biophysics apparatus to measure time perception, and EEG/ERP experiments.

INDUSTRY EXPERIENCE

Technical Consultant
Caffe Coldpress, Berkeley, CA July 2014 - May 2017
Consulted for deep learning and vision projects as a core developer of the Caffe framework.

Workshop Instructor
Partnership with the Embedded Vision Alliance, Walnut Creek, CA January - September 2016
As a deep learning researcher and open-source developer, alongside two co-instructors, developed the materials for and delivered half-day and full-day hands-on deep learning workshops for software developers, hardware engineers, and image processing experts.

Developer & Owner
Imaginary Number, Lenox, MA October 2005 - December 2011
Developed software and apparatus for CS & psychology research, created web applications for businesses and non-profits, and administered servers.

TEACHING EXPERIENCE

Graduate Student Instructor (TA)
University of California, Berkeley Fall 2013
CS 188 Artificial Intelligence: taught by Dan Klein and Pieter Abbeel and offered to four hundred Berkeley undergraduates as well as online to thousands. Led discussion section 3 hours/week, held office hours, created exams and tutorials, and helped maintain the project auto-grader.

Graduate Student Instructor (TA)
University of California, Berkeley Fall 2014
DIY Deep Learning: steered seminars, made tutorials, and answered 1000+ questions online.

Guest Lecturer
Visual Recognition Seminar, Prof. Trevor Darrell and Prof. Alexei A. Efros, UC Berkeley. 2015
Introduction to Data Science, Prof. John Canny, UC Berkeley. 2015
Convolutional Networks for Visual Recognition, Andrej Karpathy, Stanford. 2015
Deep Learning for Vision, Prof. Kate Saenko, UMass Lowell. 2014

Student Mentor
Parsa Mahmoudieh, M.S. research, now a PhD student at UC Berkeley.
Max Argus, post-bachelors research, now a PhD student at University of Freiburg.

PUBLICATIONS

Variadic Learning with Bayesian Nonparametric Deep Embeddings *NeurIPS Meta-Learning Workshop 2018*
K. Allen, H. Shin*, E. Shelhamer*, J. Tenenbaum.

Conditional Networks for Few-Shot Semantic Segmentation *ICLRW 2018*
K. Rakelly*, E. Shelhamer*, T. Darrell, A. A. Efros, S. Levine.

Zero-Shot Visual Imitation *ICLR 2018*
D. Pathak*, P. Mahmoudieh*, M. Luo*, P. Agrawal*, D. Chen, F. Shentu, E. Shelhamer, J. Malik, A. A. Efros, T. Darrell. *Oral*.

Deep Layer Aggregation *CVPR 2018*
F. Yu, D. Wang, E. Shelhamer, T. Darrell. *Oral*.

Loss Is Its Own Reward: Self-Supervision for Reinforcement Learning *ICLRW 2017*
E. Shelhamer, P. Mahmoudieh, M. Argus, T. Darrell.

Clockwork Convnets for Video Semantic Segmentation *ECCVW 2016*
E. Shelhamer*, K. Rakelly*, J. Hoffman*, T. Darrell.

Fully Convolutional Multi-class Multiple Instance Learning *ICLRW 2015*
D. Pathak, E. Shelhamer, J. Long, T. Darrell.

Fully Convolutional Networks for Semantic Segmentation *PAMI 2016*
E. Shelhamer*, J. Long*, T. Darrell.

Fully Convolutional Networks for Semantic Segmentation *CVPR 2015*
J. Long*, E. Shelhamer*, T. Darrell. *Honorable Mention for Best Paper. Oral.*

Caffe: Convolutional Architecture for Fast Feature Embedding *ACM MM 2014*
Y. Jia, E. Shelhamer, J. Donahue, S. Karayev, J. Long, R. Girshick, S. Guadarrama, T. Darrell.
Open source award.

cuDNN: Efficient Primitives for Deep Learning *NIPS DL Workshop 2014*
S. Chetlur, C. Woolley, P. Vandermersch, J. Cohen, J. Tran, B. Catanzaro, E. Shelhamer.
Oral.

Communal cuts: sharing cuts across images *NIPS DISCOPT Workshop 2014*
E. Shelhamer, S. Jegelka, T. Darrell.

TALKS

Few-Shot Segmentation through Guidance *June 2018*
Invited talk for FADEX AI, exchange hosted by INRIA Sophia Antipolis, Grenoble, and Paris.

Pixels In, Pixels Out: Learning Image-to-Image Tasks *June 2018*
Invited talk at BarCamp Yerevan, industry conference in Armenia.

Clockwork Video Segmentation *July 2017*
Invited talk for the vision group at DeepMind, London.

Fully Convolutional Networks for Semantic Segmentation 2015–2016
Invited talks at MIT, Stanford, INRIA Paris, and UMass Amherst.

End-to-End Recognition for Autonomous Vehicles *June 2016*
Invited conference talk at Intelligent Vehicles.

Caffe: Community Architecture for Fast Feature Embedding *July 2015*
Workshop talk at ICML MLOSS.
E. Shelhamer, J. Long, J. Donahue, Y. Jia.

DIY Deep Learning for Vision: a Hands-On Tutorial 2014–2016
CVPR'15 conference tutorial. Attended by 400+.
ECCV'14 conference tutorial. Attended by 100+.
GTC '15–'16 industry conference tutorial. Attended by 200+.
E. Shelhamer, J. Donahue, J. Long, Y. Jia, R. Girshick, S. Guadarrama.

The Caffe Latest Roast 2014–2016
Invited industry talks at Sony, Yahoo! Japan, Samsung, Amazon/A9.

AWARDS

Mark Everingham Prize for service to the computer vision community through Caffe. (2017)
ACM MM Open Source Award for the open source contribution of Caffe. (2014)

National Science Foundation Graduate Research Fellowship (2012-2015)
EECS Chair Excellence Award CS department award. (2012)
UMass Amherst CS Award department award for top graduating student. (2012)
ACM/UPE Award national award for achievement and outreach; one of four. (2011)
C.D. Youngren Research Award UMass research award and stipend; sole recipient. (2010)
Commonwealth Honors UMass Honors program. (2008-2012)

SERVICE

Tutorials: deep learning tutorials at CVPR'15 and ECCV'14.
Reviewing: CVPR, ICCV, ECCV, and PAMI.
Graduate Admissions, UC Berkeley: reviewing PhD applications in AI. *Jan 2016*
CSGSA: officer of the Berkeley Computer Science Graduate Association. *Jun 2013 - Dec 2015*
UMass Amherst ACM: president. *May 2011 - May 2012*
UMass Amherst Sciences Deans' Committee: open houses and outreach. *Oct 2010 - May 2012*

REFERENCES

- **Prof. Trevor Darrell**, Computer Science, UC Berkeley.
trevor@eecs.berkeley.edu.
- **Prof. Alexei A. Efros**, Computer Science, UC Berkeley.
efros@eecs.berkeley.edu.
- **Prof. Sergey Levine**, Computer Science, UC Berkeley.
svlevine@eecs.berkeley.edu.