Richard Zhang

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Last updated [Oct 2021]

RESEARCH SUMMARY

My research interests are in computer vision, deep learning, and graphics. More specifically, I am interested in using deep networks for image synthesis, as well as unsupervised learning and generative modeling.

INDUSTRIAL RESEARCH

Adobe Research
Senior Research Scientist, San Francisco, CA — Jan 2022 – Present
Research Scientist, San Francisco, CA — May 2018 – Dec 2021
Research Intern, Seattle, WA — May – Aug 2017

EDUCATION

University of California, Berkeley, Berkeley, CA
- Ph.D. in Electrical Engineering and Computer Sciences (EECS) — Aug 2012 – May 2018
  - Thesis: Image Synthesis for Self-Supervised Visual Representation Learning
  - Advisor: Prof. Alexei A. Efros

Cornell University, Ithaca, NY
- M.Eng. in Electrical & Computer Engineering (ECE) — Aug 2009 – May 2010
  - Cumulative GPA: 4.13 / 4.30
- B.S. in Electrical & Computer Engineering (ECE) — Aug 2006 – Dec 2009
  - Cumulative GPA: 4.02 / 4.30, Summa Cum Laude, Dean's List all semesters

PUBLICATIONS

CONFERENCE

[25] S. Liu, X. Zhang, Z. Zhang, R. Zhang, J.Y. Zhu, B. Russell. ***Editing Conditional Radiance Fields.*** In *ICCV*, 2021.

[24] R. Alghofaili, M. Fisher, R. Zhang, M. Lukáč, L.F. Yu. ***Exploring Sketch-based Character Design Guided by Automatic Colorization.*** In *Graphics Interfaces*, 2021.

[23] L. Chai, J.Y. Zhu, E. Shechtman, P. Isola, R. Zhang. ***Ensembling with Deep Generative Views.*** In *CVPR*, 2021.

[22] U. Ojha, Y. Li, J. Lu, A. A. Efros, Y.J. Lee, E. Shechtman, R. Zhang. ***Few-shot GAN-to-GAN Translation via Cross-domain Correspondence.*** In *CVPR*, 2021.

[21] J. Lin, R. Zhang, F. Ganz, S. Han, J.Y. Zhu. ***Anycost GANs for Interactive Image Synthesis and Editing.*** In *CVPR*, 2021.

[20] T. R. Shaham, M. Gharbi, R. Zhang, E. Shechtman, T. Michaeli. ***Spatially-Adaptive Pixelwise Networks for Fast Image Translation.*** In *CVPR*, 2021.

[19] P. Manocha, Z. Jin, R. Zhang, A. Finkelstein. ***CDPAM: Contrastive learning for perceptual audio similarity.*** In *ICASSP*, 2021.

[18] Y. Li, R. Zhang, J. Lu, E. Shechtman. ***Few-shot Image Generation with Elastic Weight Consolidation.*** In *NeurIPS*, 2020.

[17] T. Park, J.Y. Zhu, O. Wang, J. Lu, E. Shechtman, A. A. Efros, R. Zhang. ***Swapping Autoencoder for Deep Image Manipulation.*** In *NeurIPS*, 2020.

[16] T. Park, A. A. Efros, R. Zhang, J.Y. Zhu. ***Contrastive Learning for Unsupervised Image-to-Image Translation.*** In *ECCV*, 2020.

[15] M. Huh, R. Zhang, J.Y. Zhu, S. Paris, A. Hertzmann. ***Transforming and Projecting Images into Class-conditional Generative Networks.*** In *ECCV*, 2020 (oral).

[14] P. Manocha, A. Finkelstein, R. Zhang, N. J. Bryan, G. J. Mysore, Z. Jin. ***A Differentiable Perceptual Audio Metric Learned from Just Noticeable Differences.*** In *Interspeech*, 2020.

[13] S. Wang, O. Wang, R. Zhang, A. Owens, A. A. Efros. ***CNN-generated images are surprisingly easy to spot...for now.*** In *CVPR*, 2020 (oral).

[12] D. Smirnov, M. Fisher, V. Kim, R. Zhang, J. Solomon. ***Deep Parametric Shape Predictions using Distance Fields.*** In *CVPR*, 2020.

[11] N. Fish, R. Zhang, L. Perry, D. Cohen-Or, E. Shechtman, C. Barnes. ***Image Morphing with Perceptual Constraints and STN Alignment.*** In *CGF*, 2020.

[10] S. Wang, O. Wang, A. Owens, R. Zhang, A. A. Efros. ***Detecting Photoshopped Faces by Scripting Photoshop.*** In *ICCV*, 2019.

[9] A. Ghosh, R. Zhang, P. K. Dokania, O. Wang, A. A. Efros, P. H.S. Torr, E. Shechtman. ***Interactive Sketch & Fill: Multiclass Sketch-to-Image Translation.*** In *ICCV*, 2019.

[8] R. Zhang. ***Making Convolutional Networks Shift-Invariant Again.*** In *ICML*, 2019.

[7] R. Zhang, P. Isola, A. A. Efros, E. Shechtman, O. Wang. ***The Unreasonable Effectiveness of Deep Features as a Perceptual Metric.*** In *CVPR*, 2018.

[6] J.Y. Zhu, R. Zhang, D. Pathak, T. Darrell, A. A. Efros, O. Wang, E. Shechtman. ***Toward Multimodal Image-to-Image Translation.*** In *NIPS*, 2017.

[5] R. Zhang*, J.Y. Zhu*, P. Isola, X. Geng, A. S. Lin, T. Yu, A. A. Efros. ***Real-Time User-Guided Image Colorization with Learned Deep Priors.*** In *SIGGRAPH*, 2017. (*equal contribution)

[4] R. Zhang, P. Isola, A. A. Efros. ***Split-Brain Autoencoders: Unsupervised Learning by Cross-Channel Prediction.*** In *CVPR*, 2017.

[3] R. Zhang, P. Isola, A. A. Efros. ***Colorful Image Colorization.*** In *ECCV*, 2016 (oral).

[2] R. Zhang, S. Candra, K. Vetter, A. Zakhor. ***Sensor Fusion for Semantic Segmentation for Urban Scenes.*** In *ICRA*, 2015.

[1] R. Zhang and A. Zakhor. ***Automatic Identification of Window Regions on Indoor Point Clouds Using LiDAR and Cameras.*** In *WACV*, 2014.

PREPRINT

[v] N. Kumari, R. Zhang, E. Shechtman, J.Y. Zhu. ***Ensembling Off-the-shelf Models for GAN Training*** In *ArXiv*, 2021.

[iv] W. Peebles, J.Y. Zhu, R. Zhang, A. A. Efros, A. Torralba, E. Shechtman ***GAN-Supervised Dense Visual Alignment*** In *ArXiv*, 2021.

[iii] G. Parmar, R. Zhang, J.Y. Zhu. ***On Aliased Resizing Libraries and Surprising Subtleties in FID Calculation*** In *ArXiv*, 2021.

[ii] M. Huh, H. Mohabi, R. Zhang, B. Cheung, P. Agrawal, P. Isola. ***The Low-Rank Simplicity Bias in Deep Networks*** In *ArXiv*, 2021.

[i] A.X. Lee, R. Zhang, F. Ebert, P. Abbeel, C. Finn, S. Levine. ***Stochastic Adversarial Video Prediction.*** In *ArXiv*, 2018.

AWARDS

Paper Reviewing Recognitions

- NeurIPS, top 10% reviewer — Dec 2020
- ECCV, top reviewer — Oct 2020
- NeurIPS, top 50% reviewer — Dec 2019
- CVPR, outstanding reviewer — Jul 2019

Best Presentation Award, SIGGRAPH Thesis Fast Forward — Jul 2018

Adobe Research Fellowship — Jan 2017

William S. Einwechter Award, Cornell University — May 2010

- Presented to an outstanding senior who demonstrated distinguished record of service to School of ECE, College of Engineering and the university while maintaining academic performance

COMMUNITY SERVICE

AREA CHAIR

Computer Vision and Pattern Recognition (CVPR) — 2020, 2021

PAPERS REVIEWED

Computer Vision and Pattern Recognition (CVPR)	2018, 2019, 2021
European Conference on Computer Vision (ECCV)	2018, 2020
International Conference on Computer Vision (ICCV)	2017, 2019
Neural Information Processing Systems (NIPS, NeurIPS)	2016, 2017, 2018, 2019, 2020, 2021
International Conference in Machine Learning (ICML)	2019, 2020
Special Interest Group in Graphics (SIGGRAPH)	2017, 2018, 2019
Special Interest Group in Graphics, Asia (SIGGRAPH Asia)	2017, 2018, 2019, 2021
International Conference on Robotics and Automation (ICRA)	2015, 2018
International Journal of Computer Vision (IJCV)	2019, 2021
Transactions in Pattern Analysis and Machine Intelligence (TPAMI)	2018
Transactions in Image Processing (TIP)	2017, 2018
Technical Committee on Vision and Graphics (TCVG)	2018
Pacific Graphics	2018

Eurographics 2019

WORKSHOP ORGANIZATION COMMITTEE

Advancements in Image Manipulation (AIM), at ICCV 2019 Nov 2019
New Trends in Image Restoration and Enhancement (NTIRE), at CVPR 2019 Jul 2019

SELECTED PUBLICITY

Adobe MAX (Sneak Peek). *Project About Face.* Nov 2019
The Verge. *Adobe's prototype AI tool automatically spots Photoshopped faces.* Jun 2019
The New Yorker. *In the Age of A.I., Is Seeing Still Believing?* Nov 2018
Gizmodo. *AI-Powered Software Makes It Incredibly Easy to Colorize Black and White Photos.* May 2017
UK Times. *Computers give the past a blast of colour.* Apr 2016
Reddit (front page). *Use deep learning algorithms to add color to black and white images.* Jun 2016
TechCrunch. *This neural network 'hallucinates' the right colors into black and white pictures.* Mar 2016

INVITED PRESENTATIONS

Swapping Autoencoder for Deep Image Manipulation
Rework Deep Learning Summit, Generative Models Stage Jan 2021

Deep Learning for Computer Vision and Graphics
Illinois Mathematics and Science Academy, Intersession Jan 2021

Detecting Generated Imagery, Deep and Shallow
Learning-Based Image Synthesis, CMU May 2021 ECCV Sensing, Understanding and Synthesizing Workshop Aug 2020

Style and Structure Disentanglement for Image Manipulation
ECCV Advances in Image Manipulation (AIM) Workshop Aug 2020

Analyzing CNN Artifacts in Discriminative and Generative Models
Machine Learning @ Berkeley invited seminar talk Sep 2020
Graphics and Mixed Environment (GAMES) Webinar Aug 2020
CVPR Area Chair Workshop Mar 2020

Making Convolutional Networks Shift-Invariant Again
Simon Fraser University, CMPT 361 Intro to Vision, Invited Lecture Sep 2020
Berkeley AI Research (BAIR) Seminar Aug 2019
International Conference on Machine Learning (ICML) Jun 2019
Google Research, Cambridge, MA May 2019

Modeling Perceptual Similarity and Shift-Invariance in Deep Networks
NAVER Labs, Tech talk Oct 2019
University College London, Smart Geometry Processing Group seminar Oct 2019
Oxford University, VGG seminar Oct 2019
Scale.AI, seminar talk Aug 2019
Toyota Technological Institute of Chicago (TTIC), Young Researcher Talk May 2019
Massachusetts Institute of Technology (MIT), Computer Vision Seminar Apr 2019

Deep Learning for Content Synthesis
Association for Content Editors (ACE) Tech Day with Adobe Sep 2019
Hollywood Professional Association (HPA) Tech Retreat Feb 2019

Image Synthesis for Self-Supervised Visual Representation Learning
Stanford University, Graphics Group; University of Michigan, Computer Vision Group Jan 2019
Berkeley Special Topics in Deep Learning Seminar, CS 294-131 Nov 2018
SIGGRAPH 2018 Thesis Fast Forward (3 min) Jul 2018
Berkeley AI Research (BAIR) Seminar, Dissertation Talk Apr 2018
Alibaba Research; Amazon AI Deep Learning; DeepScale; Facebook AML; Fyusion; Google Research; Intel Intelligent Systems; NVIDIA Research Mar 2018
Adobe Research; Allen Institute for AI (AI2); Amazon A9; Apple Turi; eBay Research; Snap Research; WaveOne Feb 2018

Multimodal Image-to-Image Translation

University of Washington, Graphics and Imaging Lab (GRAIL) Jul 2018

Real-Time User-Guided Image Colorization with Learned Deep Priors
Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH) Aug 2017
NVIDIA SIGGRAPH Innovation Theater Aug 2017

Cross-Channel Visual Prediction
Graphics and Mixed Environment (GAMES) Webinar Oct 2017
Global AI Hackathon Webinar Jun 2017
Berkeley AI Research (BAIR) Seminar Apr 2017

Colorful Image Colorization
Berkeley AI Research (BAIR) Seminar Sep 2017
European Conference on Computer Vision (ECCV) Oct 2016
Oxford University; INRIA Paris; INRIA Sophia Antipolis; École des Ponts ParisTech Jun 2016

Sensor Fusion for Semantic Segmentation for Urban Scenes
Berkeley Deep Drive (BDD) Kickoff Mar 2016
Amazon Computer Vision PhD Symposium Oct 2015
International Conference on Robotics and Automation (ICRA) Mar 2015

Automatic Identification of Window Regions on Indoor Point Clouds Using LiDAR and Cameras
Winter Conference on Applications of Computer Vision (WACV) May 2014
Microsoft Research (MSR) Computer Vision Group Jan 2014

TEACHING EXPERIENCE

Berkeley EECS Department
- CS 188 Intro to Artificial Intelligence, *Graduate Student Instructor* Jan – May 2017
  - Instructor: Prof. Anca Dragan
- CS 280 Computer Vision, *Graduate Student Instructor* Jan – May 2016
  - Instructor: Prof. Alexei A. Efros

Cornell ECE Department
- ECE 2100 Intro to Circuits, *Teaching Assistant* Jan – May 2010
  - Instructor: Prof. Alyosha Molnar
- ECE 2100 Intro to Circuits, *Course Assistant* Aug – Dec 2008
  - Instructor: Prof. John Belina

VOLUNTEER EXPERIENCE

Berkeley AI Research (BAIR) Mentorship Program, *Mentor* Aug – Dec 2017
Illinois Math and Science Academy (IMSA), *Computer Vision Intersession Leader* Jan 2014
Clarksville Middle School, Howard County Public School System, *Volunteer* Dec 2010 – May 2011

INDUSTRY EXPERIENCE

Johns Hopkins University Applied Physics Laboratory (JHU/APL), Laurel, MD Jul 2010 – Jul 2012
- Missile Defense Radar Engineering Group, Air & Missile Defense Dept (AMDD), *Staff Engineer*
- Electro-Optical & Infrared Systems and Technologies Group, AMDD

SKILLS Python, PyTorch, Caffe, GitHub, LaTeX

LANGUAGES **Chinese (Mandarin)** – Conversational