

Saining Xie

Ph.D. Candidate
University of California, San Diego
Department of Computer Science and Engineering
La Jolla, CA 92093

Phone: (858) 729-3549
Google Scholar: [Link](#)
Email: s9xie@eng.ucsd.edu
Homepage: <http://vcl.ucsd.edu/~sxie>

Research Interests

Representation learning algorithms that help machine understand and utilize large-scale and structured information, with a focus on structural design decisions for deep neural networks to enhance representational power and efficiency and to solve challenging tasks in computer vision and machine learning.

Education

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| University of California, San Diego
Ph.D. in Computer Science
- Advisor: Zhuowen Tu
- Thesis: Deep Representation Learning with Induced Structural Priors
- Thesis Committee: Terry Sejnowski, Ravi Ramamoorthi, Lawrence Saul, David Kriegman | September 2013 - June 2018 |
| University of California, San Diego
M.Sc. in Computer Science | September 2013 - June 2015 |
| National University of Singapore
Exchange Student | October 2012 - April 2013 |
| Shanghai Jiao Tong University
B.S. in Computer Science | September 2009 - June 2013 |

Research Experiences

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| Graduate Research Assistant
- University of California, San Diego | October 2013 - Present |
| Research Intern at DeepMind , London, UK
Deep Learning Team
- Hierarchical reinforcement learning and transfer learning for robotics and control.
- with Razvan Pascanu, Nicolas Heess and Teh Whye Yeh | October 2017 - Jan 2018 |
| Research Intern at Google Research , Mountain View, CA
Machine Perception Team
- Large-scale video recognition.
- with Chen Sun, Jonathan Huang and Kevin Murphy | June 2017 - September 2017 |
| Research Intern at Facebook AI Research , Menlo Park, CA
Vision Team
- Backbone neural network engine for visual representation learning.
- with Kaiming He, Ross Girshick and Piotr Dollár | June 2016 - September 2016 |

Research Intern at Adobe Research , San Francisco, CA Creative Technologies Lab - Semantic understanding of graphic design.	June 2015 - September 2015
Research Intern at NEC Labs America , Cupertino, CA Media Analytics Department - Hierarchical and multi-task deep networks.	July 2014 - October 2014
Research Visiting Student at National University of Singapore Learning and Vision Group - Alternating direction methods for subspace learning.	July 2012 - March 2013

Awards and Honors

Google PhD Fellowship in Machine Perception	2017-2019
Marr Prize Honorable Mention	2015
CVPR'18 Doctoral Consortium Travel Award	2018
UCSD Research Travel Grant (CVPR'15, ICCV'15)	2015
IBM China Excellent Student Scholarship	2012
Toshiba Academic Scholarship	2011
SJTU Academic Excellence Scholarship	2010-2012

Preprints

1. **S. Xie**, A. Galashov, S. Liu, S. Hou, R. Pascanu, N. Heess and Y.W. Teh. "Transferring Task Goals via Hierarchical Reinforcement Learning.". Preprint, 2018 (ICML'18 submission)
2. **S. Xie**, C. Sun, J. Huang, Z. Tu and K. Murphy. "Rethinking Spatiotemporal Feature Learning: Speed-Accuracy Trade-offs in Video Classification." ArXiv preprint, 2017 (ECCV'18 submission)

Proceedings

3. **S. Xie**^{*}, S. Liu^{*}, Z. Chen and Z. Tu. (*equal contributions) "Attentional ShapeContextNet for Point Cloud Recognition." Proceedings of the Conference on Computer Vision and Pattern Recognition (CVPR'18), 2018. *indicates equal contribution.
4. **S. Xie**, R. Girshick, P. Dollár, Z. Tu and K. He. "Aggregated Residual Transformations for Deep Neural Networks." Proceedings of the Conference on Computer Vision and Pattern Recognition (CVPR'17), 2017
5. **S. Xie**^{*}, X. Huang^{*} and Z. Tu "Top-Down Learning for Structured Labeling with Convolutional Pseudoprior." Proceedings of the 14th European Conference on Computer Vision (ECCV'16), 2016. *indicates equal contribution.
6. **S. Xie** and Z. Tu. "Holistically-nested Edge Detection." Proceedings of the International Conference on Computer Vision (ICCV'15), 2015. (Oral, Marr Prize Honorable Mention Award)
7. C.Y. Lee^{*}, **S. Xie**^{*}, P. Gallagher, Z. Zhang and Z. Tu "Deeply-Supervised Nets." Proceedings of the 18th International Conference on Artificial Intelligence and Statistics (AISTATS'15), 2015. *indicates equal contribution.

8. **S. Xie**, T. Yang, X. Wang, Y. Lin. "Hyper-class Augmented and Regularized Deep Learning for Fine-grained Image Classification." Proceedings of the Conference on Computer Vision and Pattern Recognition (**CVPR'15**), 2015.
9. **S. Xie**, J. Feng, S. Yan and H. Lu. "Perception Preserving Projections." Proceedings of the British Machine Vision Conference (**BMVC'13**), 2013 (**Oral**).
10. **S. Xie**, H. Lu and Y. He. "Multi-task Co-clustering via Nonnegative Matrix Factorization." Proceedings of the 21st International Conference on Pattern Recognition (**ICPR'12**), 2012.

Journal Articles

11. **S. Xie** and Z. Tu "Holistically-nested Edge Detection", International Journal of Computer Vision (IJCV), 2017.
12. Y. He, H. Lu, L. Huang, **S. Xie** "Pairwise Constrained Concept Factorization for Data Representation", Neural Networks, 2013

Workshop Papers

13. **S. Xie**, C. Sun, J. Huang, Z. Tu and K. Murphy. "Submission to the Kinetics Human Action Recognition Challenge.", CVPR'17 ActivityNet Large Scale Activity Recognition Challenge Workshop, 2017
14. **S. Xie**, R. Girshick, P. Dollár, Z. Tu and K. He. "Aggregated Residual Transformations for Deep Neural Networks.", Beyond ImageNet Large Scale Visual Recognition Challenge Workshop, 2017
15. **S. Xie**, T. Yang, X. Wang, Y. Lin. "Hyper-class Augmented and Regularized Deep Learning for Fine-grained Image Classification.", International Workshop on Large Scale Visual Recognition and Retrieval (BigVision), 2015
16. C.Y. Lee*, **S. Xie***, P. Gallagher, Z. Zhang and Z. Tu. "Deeply-Supervised Nets.", NIPS'14 Deep Learning and Representation Learning Workshop, 2014 (Oral). *indicates equal contribution.
17. T. Chen, L. Tang, Q. Liu, D. Yang, **S. Xie**, X. Cao, C. Wu, E. Yao, Z. Liu, Z. Jiang, C. Cheng, W. Kong and Y. Yu. "Combining Factorization Model and Additive Forest for Collaborative Followee Recommendation". KDD'12, KDD Cup Workshop, 2012.

Challenges and Competitions

4th Place in Activity-Net <i>Kinetics</i> Action Recognition Challenge	2017
2nd Place in ILSVRC ImageNet Classification Task	2016
1st place in KDD Cup 2012 Data Mining Contest, Track 1	2012
NUS ACM-Chapter <i>Developer Hackathon</i> Coding Competition, Winner	2012

Talks

Deep Representation Learning with Induced Priors	
- Computational Science Research Center, SDSU	March, 2018
- CogSci Student Association Talk Series	Feb, 2018
Body Invariant Control via HRL	

- UCSD Pixel Cafe	March, 2018
- DeepMind	Jan, 2018
Dymisying 3D Convolutions for Action Recognition	
- Google	Sep, 2017
ResNeXt: Aggregated Residual Transformations	
- Microsoft Research	Jan 2017
- Tsinghua University	Jan 2017
- Chinese Academy of Sciences	Jan 2017
Deep Learning with Structured Feedback	
- Shanghai Jiao Tong University	September, 2016
Parsing Graphic Designs with CNN	
- UCSD Pixel Cafe	Jan 2016
- Adobe Research	October 2015
Holistically-Nested Edge Detection	
- Center for Computer Vision, UCSD	December 2015
- ICCV'15, Santiago, Chile	December 2015
Hyper-class Augmented and Regularized Networks	
- NEC Labs America	October 2014

Professional Experience

Conference Reviewer

CVPR 2016, 2017, 2018, ICCV 2017, NIPS 2016, ECCV 2016, 2018, ICML 2018, CogSci 2018

Journal Reviewer

Journal of Machine Learning Research, IEEE Trans. on Pattern Analysis and Machine Intelligence, International Journal of Computer Vision, IEEE Trans. on Image Processing, IEEE Trans. on Circuits and Systems for Video Technology, IEEE Trans. on Knowledge and Data Engineering, Neurocomputing, Journal of Visual Communication and Image Representation

Teaching Experience

Teaching Assistant, UCSD COGS 260

- Graduate Course on Image Recognition. Spring 2017

Teaching Assistant, UCSD COGS 185

- Undergraduate Course on Advanced Machine Learning Methods. Spring 2016

Teaching Assistant, UCSD COGS 181

- Undergraduate Course on Neural Networks and Deep Learning. Winter 2016