Dahua Lin

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PROFESSIONAL SUMMARY

- Extensive research experience on machine learning and computer vision.
- Outstanding record of publication, with over forty papers published on top conferences and journals, including one that won the best student paper award of NIPS 2010.
- Creativity, passionate commitment, and strong skills in engineering, which are demonstrated not only in academic research, but also in a series of industry-level projects.
- Strong experience in leading research teams and collaborating with industrial partners.

EDUCATION

Ph.D.   Sep, 2007 – Jul, 2012
- **Massachusetts Institute of Technology (MIT)**
- Major: Computer Science
- Advisors: John Fisher and Eric Grimson. I also worked with Alan Willsky.

M.Phil.   Aug, 2004 – Jul, 2006
- **The Chinese University of Hong Kong (CUHK)**
- Major: Information Engineering
- Advisor: Xiaoou Tang

B.Eng.   Sep, 2000 – Jul, 2004
- **University of Science and Technology of China (USTC)**
- Major: Electronic Engineering and Information Science

Exchange Student   Feb, 2003 – Jul, 2003
- **Hong Kong University of Science and Technology (HKUST)**

WORK EXPERIENCE

The Chinese University of Hong Kong (CUHK)

- **Assistant Professor**   Aug, 2014 – Present
  - Lead the research in machine learning, computer vision, and big data analytics.
  - Particularly, our research is focused on deep learning methodologies, statistical modeling and inference, high-level visual understanding, and generative image modeling.

Toyota Technological Institute at Chicago (TTIC)

- **Research Assistant Professor**   Sep, 2012 – Aug, 2014
  - Conducted research on scene understanding and interpretation, topic modeling, and Bayesian nonparametric methods.

Microsoft Research Silicon Valley

- **Research Intern**   Jun, 2010 – Aug, 2010
  - Supervised by Dr. Simon Baker.
  - Developed an algorithmic framework for connecting web images with relevant text on web pages.

Microsoft Research Redmond

- **Research Intern**   Jun, 2009 – Aug, 2009
  - Supervised by Dr. Simon Baker.
  - Developed a photo tagging framework that can jointly recognize people, events, and locations in personal photo albums.

Microsoft Research Asia

- **Visiting Student**   Feb, 2004 – Jul, 2004
  - Supervised by Dr. Yingqing Xu.
  - Developed vision-based methods for facial expression transformation.

AWARDS

- Supervise the CU-DeepLink team (3rd place in the classification task of ImageNet'16)   2016
- Cosupervise the CU-Image team (1st place in the detection task of ImageNet'16)   2016
- Supervise the CES-STAR team (1st place in ActivityNet'16 challenge)   2016

▪ Outstanding reviewer award of ICCV 2011	2011
▪ Best student paper award of NIPS 2010	2010
▪ Outstanding reviewer award of ICCV 2009	2009
▪ Best master thesis award of CUHK engineering faculty	2006
▪ University-wide outstanding bachelor thesis award of USTC	2004
▪ Samsung scholarship (awarded to the student ranked No.1 in an academic year)	2003
▪ First prize oustanding scholarship	2002
▪ Zhang Zhongzhi scholarship	2001
▪ No.1 in Guangdong province in National Physics Olympiads	1999

ACADEMIC SERVICES

I reviewed papers for the following journals :

- IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transaction on Image Processing (TIP)
- IEEE Transaction on Circuits and Systems for Video Technology (TCSVT)
- Journal of Machine Learning Research (JMLR)
- Neural Computation

I served on the program commitees of the following conferences :

- Neural Information Processing Systems (NIPS)
- International Conference on Machine Learning (ICML)
- AAAI Conference
- International Conference on Computer Vision (ICCV)
- IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- European Conference on Computer Vision (ECCV)
- Asian Conference on Computer Vision (ACCV)

COURSES

CUHK IERG4190 Multimedia Coding and Processing
- 2014-15 Fall, 2015-16 Fall

CUHK IERG4160 Image and Video Processing
- 2016-17 Spring (shared with Prof. Chen Change Loy)

CUHK IERG6130 Probabilistic Models and Inference Algorithms
- 2014-15 Spring, 2015-16 Spring, 2016-17 Spring

CUHK IERG6210 Advanced Topics in Information Processing
- 2016-17 Fall (shared with Prof. Xiaoou Tang)

OPEN SOURCE CONTRIBUTIONS

Julia Packages on Statistics and Learning
- **Web:** http://juliastats.github.io
- Julia is a high-performance dynamic programming language for technical computing, which provides high-level interface as in MATLAB and high efficiency (comparable to C) through Just-in-Time compilation. I was an important contributor to the development of this language, and the leading developer of multiple key libraries (e.g. NumericExtensions, Stats, Graphs, Distributions, Regression, and Clustering).

Probabilistic Learning and Inference Toolbox (pli-toolbox)
- **Web:** https://github.com/lindahua/pli-toolbox
- I developed the Statistical Learning Toolbox (sltoolbox) in year 2006, which comprises a collection of algorithms on pattern recognition, feature extraction, manifold learning, and clustering . Since released, it has been downloaded over 20,000 times. Later, the toolbox was revised with new functionalities on probabilistic learning and inference. The new toolbox is named pli-toolbox.

Light-Matrix Library

- **Web:** https://github.com/lindahua/light-matrix
- A C++ template library for efficient matrix-based computation. This library provides high level interfaces for library users while generating efficient low-level codes (e.g. SIMD and Open MP) through template meta-programming.

PUBLICATIONS

[1] Zhizhong Li, Dahua Lin. "Integrating Specialized Classifiers Based on Continuous Time Markov Chain". *Accepted to International Joint Conference on Artificial Intelligence (IJCAI),* 2017.

[2] Ruohui Wang, Dahua Lin. "Scalable Estimation of Dirichlet Process Mixture Models on Distributed Data". *Accepted to International Joint Conference on Artificial Intelligence (IJCAI),* 2017.

[3] Bo Dai, Dahua Lin. "Detecting Visual Relationships with Deep Relational Networks". *Accepted to IEEE Conference on Computer Vision and Pattern Recognition (CVPR)[Oral],* 2017.

[4] Xingcheng Zhang, Zhizhong Li, Chen Change Loy, Dahua Lin. "PolyNet: A Pursuit of Structural Diversity in Very Deep Networks". *Accepted to IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2017.

[5] Kai Chen, Hang Song, Chen Change Loy, Dahua Lin. "Discover and Learn New Objects from Documentaries". *Accepted to IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2017.

[6] Limin Wang, Yuanjun Xiong, Dahua Lin, Luc Van Gool. "UntrimmedNets for Weakly Supervised Action Recognition and Detection". *Accepted to IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2017.

[7] Zhirong Wu, Dahua Lin, Xiaoou Tang. "Deep Markov Random Field for Image Modeling". *European Conference on Computer Vision (ECCV),* 2016.

[8] Limin Wang, Yuanjun Xiong, Zhe Wang, Yu Qiao, Dahua Lin, Xiaoou Tang, Luc Van Gool. "Temporal Segment Networks: Towards Good Practices for Deep Action Recognition". *European Conference on Computer Vision (ECCV),* 2016.

[9] Yuanjun Xiong, Limin Wang, Zhe Wang, Bowen Zhang, Hang Song, Wei Li, Dahua Lin, Yu Qiao, Luc Van Gool, Xiaoou Tang. "CUHK and ETHZ and SIAT Submission to ActivityNet Challenge 2016". *arXiv:1608.00797,* 2016.
   - **We won the first place in the classification task at the ActivityNet 2016 challenge.**

[10] Botao Wang, Dahua Lin, Hongkai Xiong, Yuan F Zheng. "Joint Inference of Objects and Scenes with Efficient Learning of Text-Object-Scene Relations". *IEEE Transactions on Multimedia (TMM),* 2016.

[11] Zhirong Wu, Dahua Lin, Xiaoou Tang. "Adjustable Bounded Rectifiers: Towards Deep Binary Representations". *arXiv:1511.06201,* 2015.

[12] Dahua Lin, Chen Kong, Sanja Fidler, Raquel Urtasun. "Generating Multi-Sentence Lingual Descriptions of Indoor Scenes". *British Machine Vision Conference (BMVC)[Oral],* 2015.

[13] Yuanjun Xiong, Kai Zhu, Dahua Lin, Xiaoou Tang. "Recognize Complex Events from Static Images by Fusing Deep Channels". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2015.

[14] Anitha Kannan, Simon Baker, Krishnan Ramnath, Juliet Fiss, Dahua Lin, Lucy Vanderwende, Rizwan Ansary, Ashish Kapoor, Qifa Ke, Matt Uyttendaele, Xin-Jing Wang, Lei Zhang. "Mining Text Snippets for Images on the Web". *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD),* 2014.

[15] Dahua Lin, Sanja Fidler, Chen Kong, Raquel Urtasun. "Visual Semantic Search: Retrieving Videos via Complex Textual Queries". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2014.

[16] Chen Kong, Dahua Lin, Mohit Bansal, Raquel Urtasun, Sanja Fidler. "What are you talking about? Text-to-Image Co-reference". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2014.

[17] Dahua Lin. "Online Learning of Nonparametric Mixture Models via Sequential Variational Approximation". *Annual Conference on Neural Information Processing Systems (NIPS),* 2013.

[18] Dahua Lin, Sanja Fidler, Raquel Urtasun. "Holistic Scene Understanding for 3D Object Detection with RGBD Cameras". *International Conference on Computer Vision (ICCV)[Oral],* 2013.

[19] Dahua Lin, Jianxiong Xiao. "Characterizing Layouts of Outdoor Scenes Using Spatial Topic Processes". *International Conference on Computer Vision (ICCV),* 2013.

[20] Dihong Gong, Zhifeng Li, Dahua Lin, Jianzhuang Liu, Xiaoou Tang. "Hidden Factor Analysis for Age Invariant Face Recognition". *International Conference on Computer Vision (ICCV),* 2013.

[21] Dahua Lin, John Fisher. "Coupling Nonparametric Mixtures via Latent Dirichlet Processes". *Annual Conference on Neural Information Processing Systems (NIPS),* 2012.

[22] Dahua Lin, John Fisher. "Coupled Dirichlet Processes: Beyond HDP". *NIPS Workshop on Bayesian Nonparametric Models For Reliable Planning And Decision-Making Under Uncertainty,* 2012.

[23] Donglai Wei, Dahua Lin, John Fisher. "Learning Deformations with Parallel Transport". *European Conference on Computer Vision (ECCV),* 2012.

[24] Ashish Kapoor, Dahua Lin, Simon Baker, Gang Hua, Amir Akbarzadeh. "How to Make Face Recognition Work: The Power of Modeling Context". *Proceedings of workshops at the 26th AAAI Conference,* 2012.

[25] Dahua Lin, John Fisher. "Manifold Guided Composite of Markov Random Fields for Image Modeling". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2012.

[26] Dahua Lin, John Fisher. "Low Level Vision via Switchable Markov Random Fields". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2012.

[27] Dahua Lin, John Fisher. "Efficient Sampling from Combinatorial Space via Bridging". *International Conference on Artificial Intelligence and Statistics (AISTATS),* 2012.

[28] Jingqing Zhang, Ardemis A. Boghossian, Paul W. Barone, Alina Rwei, Jong-Ho Kim, Dahua Lin, Daniel A. Heller, Andrew J. Hilmer, Nitish Nair, Nigel F. Reuel, Michael S. Strano. "Single Molecule Detection of Nitric Oxide Enabled by d(AT)15 DNA Adsorbed to Near Infrared Flurescent Single-Walled Carboon Nanotubes". *Journal of American Chemistry Society,* 2011.
- **I helped building the data analysis algorithm for this Chem.Eng paper, and was therefore listed as one of the authors.**

[29] Dahua Lin, Eric Grimson, John Fisher. "Construction of Dependent Dirichlet Processes based on Poisson Processes". *Annual Conference on Neural Information Processing Systems (NIPS)[Oral],* 2010.
- **Best student paper award (only two awarded out of about 1600 submissions).**

[30] Dahua Lin, Ashish Kapoor, Gang Hua, Simon Baker. "Joint People, Event, and Location Recognition in Personal Photo Collections Using Cross-Domain Context". *European Conference on Computer Vision (ECCV),* 2010.

[31] Dahua Lin, Eric Grimson, John Fisher. "Modeling and Estimating Persistent Motion with Geometric Flows". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2010.

[32] Dahua Lin, Eric Grimson, John Fisher. "Learning Visual Flows: A Lie Algebraic Approach". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2009.

[33] Zhifeng Li, Dahua Lin, Xiaoou Tang. "Nonparametric Discriminant Analysis for Face Recognition". *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI),* 2009.

[34] Dahua Lin, Xiaoou Tang. "Quality-Driven Face Occlusion Detection and Recovery". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2007.

[35] Zhifeng Li, Dahua Lin, Helen Meng, Xiaoou Tang. "Discriminant Mutual Subspace Learning for Indoor and Outdoor Face Recognition". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2007.

[36] Dahua Lin, Xiaoou Tang. "Recognize High Resolution Faces: From Macrocosm to Microcosm". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2006.

[37] Dahua Lin, Shuicheng Yan, Xiaoou Tang. "Pursuing Informative Projection on Grassmann Manifold". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)[Oral],* 2006.

[38] Dahua Lin, Xiaoou Tang. "Conditional Infomax Learning: An Integrated Framework for Feature Extraction and Fusion". *European Conference on Computer Vision (ECCV)[Oral],* 2006.

[39] Dahua Lin, Xiaoou Tang. "Inter-modality Face Recognition". *European Conference on Computer Vision (ECCV)[Oral],* 2006.

[40] Dahua Lin, Xiaoou Tang. "Coupled Space Learning for Image Style Transformation". *International Conference on Computer Vision (ICCV),* 2005.

[41] Wei Liu, Dahua Lin, Xiaoou Tang. "Hallucinating Faces: TensorPatch Super-Resolution and Coupled Residue Compensation". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2005.

[42] Zhifeng Li, Wei Liu, Dahua Lin, Xiaoou Tang. "Nonparametric Subspace Analysis for Face Recognition". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR),* 2005.

[43] Dahua Lin, Shuicheng Yan, Xiaoou Tang. "Feedback-based Dynamic Generalized LDA for Face Recognition". *IEEE International Conference on Image Processing (ICIP),* 2005.

[44] Dahua Lin, Shuicheng Yan, Xiaoou Tang. "Comparative Study: Face Recognition on Unspecific Persons using Linear Subspace Methods". *IEEE International Conference on Image Processing (ICIP),* 2005.

[45] Dahua Lin, Wei Liu, Xiaoou Tang. "Layered Local Prediction Network with Dynamic Learning for Face Superresolution". *IEEE International Conference on Image Processing (ICIP),* 2005.

[46] Dahua Lin, Yingqing Xu, Xiaoou Tang, Shuicheng Yan. "Tensor-based Face Decomposition for Relighting". *IEEE International Conference on Image Processing (ICIP),* 2005.

[47] Wei Liu, Dahua Lin, Xiaoou Tang. "Face Hallucination Through Dual Associative Learning". *IEEE International Conference on Image Processing (ICIP),* 2005.

[48] Wei Liu, Dahua Lin, Xiaoou Tang. "Neighbor Combination and Transformation for Hallucinating Faces". *International Conference on Multimedia and Expo,* 2005.