

Wei-Sheng Lai

Curriculum Vitae

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Education

- 2015–Present **Ph.D. Student**, *University of California, Merced, CA, USA.*
Electrical Engineering and Computer Science
Vision and Learning Lab [📄 link](#)
- 2012–2014 **Masters of Science**, *National Taiwan University, Taipei, Taiwan.*
Communication Engineering
- 2008–2012 **Bachelor of Science**, *National Taiwan University, Taipei, Taiwan.*
Electrical Engineering

Research Interests

Computer Vision, Computational Photography, Machine Learning

Publications [\(📄 Google Scholar profile\)](#)

- CVPR 2017 **Deep Laplacian Pyramid Networks for Fast and Accurate Single Image Super-Resolution.**
[Wei-Sheng Lai](#), Jia-Bin Huang, Narendra Ahuja, and Ming-Hsuan Yang
IEEE Conference on Computer Vision and Pattern Recognition, 2017
- CVPR 2017 **Learning Fully Convolutional Networks for Iterative Non-blind Deconvolution.**
Jiawei Zhang, Jinshan Pan, [Wei-Sheng Lai](#), Rynson Lau, Ming-Hsuan Yang
IEEE Conference on Computer Vision and Pattern Recognition, 2017
- CVPR 2016 **A Comparative Study for Single-Image Blind Deblurring.**
[Wei-Sheng Lai](#), Jia-Bin Huang, Zhe Hu, and Ming-Hsuan Yang
IEEE Conference on Computer Vision and Pattern Recognition, 2016 [📄 paper](#) [📄 project](#)
Spotlight Presentation [📄 link](#)
- CVPR 2015 **Blur Kernel Estimation using Normalized Color-Line Priors.**
[Wei-Sheng Lai](#), Jian-Jiun Ding, Yen-Yu Lin, and Yung-Yu Chuang
IEEE Conference on Computer Vision and Pattern Recognition, 2015 [📄 paper](#) [📄 project](#)
- PCM 2013 **High Quality Image Deblurring Scheme Using the Pyramid Hyper-Laplacian L2 Norm Priors Algorithm.**
Yu Chen, Jian-Jiun Ding, [Wei-Sheng Lai](#), Ying-Jou Chen, Chir-Wei Chang, and Chuan-Chung Chang
Pacific-Rim Conference on Multimedia [📄 paper](#)
- ISCAS 2013 **Improved Structural Similarity Measurement for Vocal Signals.**
[Wei-Sheng Lai](#), Chi-Jung Tseng, and Jian-Jiun Ding
IEEE International Symposium on Circuits and Systems, 2013 [📄 paper](#)

Research Experience

- May. 2016 - Aug. 2016 **Cognition Group, Microsoft Research, Redmond.**
Research Intern with Dr. Sing Bing Kang
- **Semantic-Driven Hyperlapse Generation from 360° Videos.**
This work aim to create hyperlapse videos that revolves around visual emphasis, e.g., landmarks, with variable speed and zoom from first-person 360° videos.
- Aug. 2015 – Present **Vision and Learning Lab, EECS, University of California, Merced.**
Graduate Research Assistant with Prof. Ming-Hsuan Yang
- **Unsupervised Learning of Optical Flow**
This work aims to solve optical flow estimation using deep convolutiona neural networks without leveraging ground truth data.
 - **Learning-based Video Frame Interpolation**
This work aims to solve frame interpolation by incorporate flow-based methods in deep convolutional neural networks.
 - **Single Image Super Resolution with Orientation Decomposition and Anti-Aliasing**
This work aims to solve the aliasing problem in image super-resolution using multi-orientations sub-band decomposition and data-driven anti-aliasing filters.
 - **Fast Image Super-Resolution Using Deep Convolutional Neural networks**
This work aims to accelerate CNN-based super-resolution using a Laplacian Pyramid CNN that progressively reconstructs the sub-band residuals in a coarse-to-fine manner.
 - **Convolutional Neural Networks for Natural Image Matting**
This work aims to solve image matting by extracting features from input images and trimaps with convolutional neural network (CNN).
 - **A Comparative Study of Single-Image Blind Deblurring**
This work aims to evaluate the performance of single-image blind deblurring algorithms on *real-world* images by utilizing large-scale human subject studies.
 - **Fast Direct Super-Resolution by Simple Function**
This work aims to solve single-image super-resolution by splitting input space and learn multiple regressors for each subspace.
- Jul. 2014 - Jul. 2015 **Communication and Multimedia Lab, CSIE, National Taiwan University.**
Research Assistant with Prof. Yung-Yu Chuang
- **Wide-angle Image Warping and Projection**
This work aims to design a content-aware wide-angle image projection model that unified several projections (e.g. stereographic, cylindrical and Pannini projection).
 - **Blur Kernel Estimation using Normalized Color-Line Priors**
This work aims to develop a single-image blur kernel estimation algorithm that utilizes the normalized color-line prior and MAP optimization framework.
- Jul. 2014 - Jun. 2015 **Computer Vision Lab, Academia Sinica, Taipei, Taiwan.**
Research Assistant with Dr. Yen-Yu Lin
- **Convolutional Neural Network for Dimensionality Reduction**
This work aims to propose a unified framework which integrates the Convolutional Neural Network (CNN) and dimensionality reduction methods.
- Jul. 2012 - Aug. 2012 **Yotta Lab, Taipei, Taiwan.**
Research Intern
- **Real-Time Video Conference on Embedding System**
This work aims to develop an real-time video conference embedded system on DE2.

Teaching Experience

Aug. 2015 – Present **EECS, University of California, Merced.**

- CSE 165 Object Oriented Programming [C++ Programming] (Spring 2017)
- CSE 030 Data Structure [C++ Programming] (Fall 2016)
- CSE 185 Introduction to Computer Vision [MATLAB programming] (Spring 2016)
- CSE 020 Introduction to Computing [Java Programming] (Fall 2015)

Sep. 2013 - Jun. 2015 **EE/CSIE, National Taiwan University, Taipei, Taiwan.**

- Digital Visual Effects (Spring 2015)
- Digital Image Synthesis (Fall 2014)
- Advanced Digital Signal Processing (Spring 2014)
- Time-Frequency Analysis and Wavelet Transform (Fall 2013)

Awards

Sep. 2013 **Class A Scholarship**, National Taiwan University.
Top 10% of students in one academic year

Jan. 2009, Jun. 2009 **Presidential Award**, National Taiwan University.
Top 5% of students in one semester

Academic Services

Conference Reviewer IEEE International Conference on Computer Vision, 2017 (**ICCV 2017**)
IEEE Conference on Computer Vision and Pattern Recognition, 2017 (**CVPR 2017**)
European Conference on Computer Vision, 2016 (**ECCV 2016**)
Asian Conference on Computer Vision, 2016 (**ACCV 2016**)
Neural Information Processing Systems, 2016 (**NIPS 2016**)
Pacific Graphics, 2016 (**PG 2016**)

Journal Reviewer Computer Vision and Image Understanding (**CVIU**)
Signal, Image and Video Processing (**SIVP**)

Technical Skills

Programming C/C++, Python
Toolbox / Software MATLAB, OpenCV, MatConvNet, Caffe, Torch

References

Ph.D. Advisor **Ming-Hsuan Yang**, *Associate Professor*, University of California, Merced.
✉ mhyang@ucmerced.edu [f](#) [homepage](#)

Research Mentor **Jia-Bin Huang**, *Assistant Professor*, Virginia Tech, Virginia.
✉ jbhuang@vt.edu [f](#) [homepage](#)

Research Mentor **Sing Bing Kang**, *Principal Researcher*, Microsoft Research, Redmond.
✉ sbkang@microsoft.com [f](#) [homepage](#)

Research Mentor **Yung-Yu Chuang**, *Professor*, National Taiwan University, Taiwan.
✉ cyy@csie.ntu.edu.tw [f](#) [homepage](#)

Research Mentor **Yen-Yu Lin**, *Associate Research Fellow*, Academia Sinica, Taiwan.
✉ yylin@citi.sinica.edu.tw [f](#) [homepage](#)