# Wei-Sheng Lai (Jason)

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## Education

- **University of California, Merced**, CA, USA — Aug. 2015 - present
  Ph.D. student, Electrical Engineering and Computer Science
- **National Taiwan University**, Taipei, Taiwan — Sep. 2012 - Jun. 2014
  M.S., Graduate Institute of Communication Engineering
- **National Taiwan University**, Taipei, Taiwan — Sep. 2008 - Jun. 2012
  B.S., Department of Electrical Engineering

## Research Interests

Computer Vision, Computational Photography, Machine Learning

## Publication

[1] <u>Wei-Sheng Lai</u>, Jian-Jiun Ding, Yen-Yu Lin, and Yung-Yu Chuang, "Blur Kernel Estimation using Normalized Color-Line Priors", In *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), 2015.

[2] Yu Chen, Jian-Jiun Ding, <u>Wei-Sheng Lai</u>, Ying-Jou Chen, Chir-Wei Chang, and Chuan-Chung Chang, "High Quality Image Deblurring Scheme Using the Pyramid Hyper-Laplacian L2 Norm Priors Algorithm," In *Proceedings of Pacific-Rim Conference on Multimedia* (PCM), pp. 134-145, 2013.

[3] <u>Wei-Sheng Lai</u>, Chi-Jung Tseng, and Jian-Jiun Ding, "Improved structural similarity measurement for vocal signals," In *Proceedings IEEE International Symposium on Circuits and Systems* (ISCAS), pp. 301-304, 2013.

## Research Experience

- **Wide-angle Image Warping and Projection**

  - Designed a content-aware wide-angle image projection model that unified several projection models (e.g. stereographic projection, cylindrical projection, and Pannini projection).

- **Natural Image Deblurring**

  - Utilized the statistic property of color image patches and proposed a normalized color-line prior for single-image blur kernel estimation

- **Deep Learning for Dimensionality Reduction**

  - Integrated Convolutional Neural Network (CNN) and dimensionality reduction methods which are expressible by graph embedding.

  - Proposed a unified framework, CNN-DR, which can be applied to supervised, unsupervised and semi-supervised learning problems.

- **Quality Assessment of Vocal Signals**

  - Proposed a vocal signal quality assessment metric by Structural Similarity (SSIM) and non-uniform sampling of Fourier Transform coefficients.

## Honors and Awards

- **Class A Scholarship** in Graduate Institute of Communication Engineering, NTU, 2013
  (top 10% of students in one academic year)
- **Presidential Award** in Electrical Engineering department, NTU, 2009
  (top 5% of students in one semester)

## Working and Teaching Experience

- **Teaching Assistant** at Computer Science Department, NTU          Sep. 2014 - Jun. 2015

  Digital Visual Effects (Spring 2014), Digital Image Synthesis (Fall 2014)
- **Research Assistant** at Academia Sinica, Taipei, Taiwan          Jul. 2014 - Jun. 2015
- **Teaching Assistant** at Electrical Engineering Department, NTU          Sep. 2013 - Jun. 2014

  Time-Frequency Analysis and Wavelet Transform (Fall 2013), Advanced Digital Signal Processing (Spring 2014)
- **Research Assistant** intern at Yotta Labs, Taipei, Taiwan          Jul. 2012 - Aug. 2012

  Designed and implemented an integration embedded system on DE2-115 for a real-time video conference project.

## Selected Term Projects

- **Machine Learning and having it Deep and Structured**          Feb. 2015 - Jun. 2015

  - Designed a ASR system by using DNN features, structure-SVM and RNNLM
- **Machine Learning**          Sep. 2013 - Jan. 2014

  - Designed a Chinese character recognition system by using libSVM and feature selection
- **3D Multimedia System Design**          Feb. 2013 - Jun. 2013

  - Used OpenCL to parallelize stereo matching algorithms and speeded up to 30 times faster than CPU version
- **Digital Visual Effect**          Feb. 2013 - Jun. 2013

  - Studied and implemented several image matting algorithms.

  - Designed a system that synthesizes motion blur background and keep foreground on fucus from two successive pictures by using grab cut and optical flow algorithms.
- **Digital Image Synthesis**          Sep. 2012 - Jan. 2013

  - Extended PBRT to render color dispersion effects, including refracted rainbows and camera color aberration.
- **Multimedia Analysis and Indexing**          Sep. 2012 - Jan. 2013

  - Designed a system to classify the painting style of animations and comics by using libSVM.

## Skills

- **Programming Languages**     C/C++, Python
- **Tools and Library**          MATLAB, OpenCV, LaTeX, scikit-learn
- **Languages**                  Chinese(native), English(fluent), Japanese(JLPT N2 passed, Jul. 2013)

## References

- Ming-Hsuan Yang

  Associate Professor, University of California, Merced

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- Yung-Yu Chuang

  Professor, National Taiwan University, Taiwan

  E-mail: cyy@csie.ntu.edu.tw


- Yen-Yu Lin

  Associate Research Fellow, Academia Sinica, Taiwan

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