

WEI-LUN CHAO

CONTACT INFORMATION

Room 8, 12 F., No. 447, Sec. 2, Chongde Rd., Beitun District,
Taichung City 40674, Taiwan (R. O. C.)
+886-912045272

weilunchao760414@gmail.com
<http://disp.ee.ntu.edu.tw/~pujols/>
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EDUCATION

National Chiao Tung University (NCTU), Hsinchu, Taiwan Sep. 2005 – Jun. 2009

- B.S., Department of Communication Engineering
- *GPA: 3.93/4.0 (90.82/100), Major GPA: 3.97/4.0 (93.20/100)*
- *Rank: 2/43 (in the class)*

University of Illinois at Urbana-Champaign (UIUC), IL, USA Jan. 2009 – Jun. 2009

- Exchange Student, College of Engineering
- Individual Study Advisor: Prof. Pierre Moulin
- *GPA: 4.0/4.0*

National Taiwan University (NTU), Taipei, Taiwan Sep. 2009 – Jun. 2011

- M.S., Graduate Institute of Communication Engineering
- Advisor: Prof. Jian-Jiun Ding
- *GPA: 4.0/4.0 (95.48/100)*
- *Rank: 1/122*

National Taiwan University (NTU), Taipei, Taiwan Sep. 2011 – Jul. 2012

- Ph.D., Graduate Institute of Communication Engineering (dropout)
- Advisor: Prof. Jian-Jiun Ding
- *GPA: 4.3/4.3*

University of Southern California (USC), Los Angeles, CA, U.S.A. Aug. 2013 – Present

- Ph.D., Department of Computer Science
- Advisor: Prof. Fei Sha

WORK EXPERIENCE

Military Service, Ministry of National Defense, Taiwan (R. O. C.) Aug. 2012 – Jul. 2013

- Second Lieutenant, Chief Counselor of Company

RESEARCH INTERESTS

Computer Vision, Machine Learning, Pattern Recognition, Multimedia Signal Processing & Retrieval

RESEARCH EXPERIENCE

UIUC:

- *Video Fingerprinting (Jan. 2009 – Jun. 2009)*
 - Implemented several popular algorithms (e.g. SIFT visual words) for comparison and analysis.

Digital Image and Signal Processing Laboratory (DISP Lab), NTU:

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- *Anti-symmetric Fourier Descriptor for Boundary Compression (Jan. 2010 – Jun. 2012)*
 - Proposed a warping & anti-symmetric extension scheme to first close and smooth the non-closed object contours. Therefore, the compressibility of the Fourier descriptors could be fully displayed.
 - Derived the proof of the exact end point preserving property under arbitrary compression rate.
 - Proposed a pre-segmentation procedure for improving the compressibility on closed contours.
 - *A Study on Face Detection and Recognition (Apr. 2010 – Sep. 2010)*
 - *Facial Age Estimation (Oct. 2010 – Sep. 2011)*
 - Combine distance metric and manifold learning for enhancing the feature discriminability.
 - Proposed the label-sensitive concept for considering the ordinal relationship among ages.
 - Proposed the local regressor KNN-SVR to match the local Euclidean space after manifold learning.
 - *A Study on Manifold and Distance Metric Learning (Jan. 2011 – May 2011)*
 - *Facial Expression Recognition (Oct. 2011 – Jul. 2012)*
 - Developed the expression-specific LBP by emphasizing the partial information of human faces.
 - Proposed the class-regularized locality preserving projection to maximize the class independence.

Other Research Projects in NTU:

- *Video Retargeting Based on Seam Carving (with Prof. Winston Hsu, May 2010 – Sep. 2011)*
 - Replaced the graph-cut algorithm in video seam carving by dynamic programming for speed-up.
 - Proposed an effective propagation scheme to guide the seam movements among consecutive frames.
- *Hashing for Large-Scale Image Retrieval (with Prof. Winston Hsu, Oct. 2011 – Jan. 2012)*
 - Designed a novel hashing algorithm via pair-wise ranking and AdaBoost.
 - Designed a bit selection strategy for each query by considering the decision margin.
- *Color Constancy and Color Correction (with Prof. Soo-Chang Pei, Jan. 2012 – Present)*
 - Modeled the optimization problems faced in illuminant estimation and illuminant combination.

PUBLICATION

M.S. Thesis

Wei-Lun Chao, “Integrated machine learning algorithm for human age estimation,” NTU, Jun., 2011.

International Journal (published)

- [1] Feng-Ju Chang, Soo-Chang Pei, and Wei-Lun Chao, “Color constancy by chromaticity neutralization,” *Journal of the Optical Society of America A*, vol. 10, no. 29, pp. 2217–2225, 2012
- [2] Wei-Lun Chao, Jun-Zuo Liu, and Jian-Jiun Ding, “Facial age estimation based on label-sensitive learning and age-oriented regression,” *Pattern Recognition*, vol. 46, issue 3, pp. 628–641, 2013

International Journal (submitted or under construction)

- [3] Jian-Jiun Ding, Wei-Lun Chao, Jiun-De Huang, and Cheng-Jin Kuo, “Anti-symmetric Fourier descriptor for non-closed segments,” submitted to *IEEE Trans. Image Processing*, Sep., 2012
- [4] Wei-Lun Chao, Jun-Zuo Liu, and Jian-Jiun Ding, “Facial expression recognition based on improved local binary pattern and class-regularized locality preserving projection,” to be submitted

International Conference

- [1] Jian-Jiun Ding, Wei-Lun Chao, Jiun-De Huang, and Cheng-Jin Kuo, “Asymmetric Fourier descriptor of non-

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- closed segments,” IEEE ICIP (**Oral presentation**), Sep., 2010 (Oral rate: 18%)
- [2] Wei-Lun Chao, Hsiao-Hang Su, Shao-Yi Chien, Winston Hsu, and Jian-Jiun Ding, “Coarse-to-fine temporal optimization for video retargeting based on seam carving,” IEEE ICME (**Oral presentation**), Jul., 2011 (Acceptance rate: 30%; oral rate: 7.5%)
- [3] Jian-Jiun Ding, Yu-Hsiang Wang, Lee-Lin Hu, Wei-Lun Chao, and Yio-Wha Shau, “Muscle injury determination by image segmentation,” IEEE VCIP (**Oral presentation**), Nov., 2011
- [4] Wei-Lun Chao, Jun-Zuo Liu, and Jian-Jiun Ding, “Facial age estimation based on label-sensitive learning and age-specific local regression,” IEEE ICASSP (**Oral presentation**), Mar., 2012 (Oral rate: 10%)

AWARDS AND HONORS

B.S. in National Chiao Tung University (NCTU)

- Avg. Score: Rank 3 in the Dept. Communication Engineering, NCTU (3/90; 2/43 in the class)
- President’s Award, NCTU (3 times)
 - Top 6% students per semester announced this award in the Dept. Communication Engineering.
- Exchange Student Scholarship to UIUC, 2009
 - Cash Prize, \$10,000. Cover the tuition and part of the living expense at UIUC.

M.S. in National Taiwan University (NTU)

- Avg. Score: Rank 1 in the Grad. Inst. Communication Engineering, NTU (1/122)
- Honor Student Member of the Phi Tau Phi Scholastic Honor Society of the Republic of China, 2011
 - Awarded for excellent academic performance.
 - Only 2 students per year announced this honor from the Grad. Inst. Communication Engineering.
- Graduate Student Scholarship, NTU, 2010 – 2011
 - Top 10% students per semester announced this award in the Grad. Inst. Communication Engineering.
- **Long-Term Scholarship for Talented Students, Hsing Tian Kong Culture & Education Development Foundation, 2010 – Present**
 - Awarded for excellent academic and research performance.
 - Each semester, only 3 students majoring in science or engineering announced this award nationwide.
 - Cover the tuition at NTU, and continue for the upcoming Ph.D. study if admitted.
- Student Travel Grant for ICME 2011, sponsored by Qualcomm
- Student Travel Grant for ICASSP 2012, sponsored by IEEE Signal Processing Society

Ph.D. in University of Southern California (USC)

- Viterbi Graduate School Ph.D. Fellowship, USC, 2013-Present

Other Scholarships for outstanding academic performance

- From Delta Electronics, Inc., 2006; Datatronics Technology, Inc., 2007; Chin-Chih, 2008; Dung Guang Education Foundation, 2010.

PROFESSIONAL EXPERIENCE

Teaching Assistant

- Time Frequency Analysis and Wavelet Transforms, NTU, Fall 2010
- Signals and Systems, NTU, Spring 2011

Guest Speaker

- On Dimensionality Reduction and Manifold Learning, in the Advance Multimedia Analysis and Indexing course instructed by Prof. Winston Hsu, NTU, 2011 – 2012 (totally 4 weeks)

Conference Attendance

- Oral Presentation: IEEE ICIP 2010, IEEE ICME 2011, and IEEE ICASSP 2012

Tutorial Report

- An Introduction to Video Fingerprinting, DISP Lab, NTU, 2009
- Face Recognition Survey, DISP Lab, NTU, 2010
- An Introduction to Machine Learning, DISP Lab, NTU, 2011
- An Introduction to Dimensionality Reduction, DISP Lab, NTU, 2011
- An Introduction to Support Vector Machine, DISP Lab, NTU, 2011

Journal Review

- ETRI Journal, Korea, 2010

PROFESSIONAL COURSE EXPERIENCE

Enrolled Courses (in course names)

- Image & Video Processing, Digital Image Processing
- Multimedia Analysis and Indexing, Advanced Multimedia Analysis and Indexing
- Machine Learning, Optimization and Machine Learning, Statistical Methods for Intelligent Information Processing (Probabilistic Graphical Models)
- Digital Signal Processing, Advanced Digital Signal Processing, Time Frequency Analysis and Wavelet Transforms, Data Compression

Audited Courses (in fields)

- Information Retrieval, Web Mining
- Digital Visual Effects, Computational Photography
- Artificial Neural Networks
- Image & Video Compression, Digital Speech Processing

Course Projects

- Baseball Game Event Detection, Fall 2009
- Image Segmentation Based on Normalized Cuts, Fall 2009
- Gabor Wavelets and Its Applications, Fall 2009
- Image and Video Retargeting Based on Seam Carving and Warping, Spring 2010
- Machine Learning Competition Using The Data of KDD Cup 2009, Fall 2010
- Age and Gender Classification Based on Probabilistic Graphical Models, Fall 2010