

Wei-Yu (Harvey) Chen

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RESEARCH INTERESTS

Machine learning, Computer vision, Robotics

EDUCATION

M.S. in Electrical Engineering, National Taiwan University

09/2015–01/2017

Computer Science Division, Network Database Lab. Co-advisor: Ming-Syan Chen, Yu-Chiang Frank Wang

Cumulative GPA :**4.22**/4.30

B.S. in Electrical Engineering, National Taiwan University

09/2011–06/2015

Cumulative GPA :**4.15**/4.30

Overall ranking: 7/205

PUBLICATIONS

[1] Yi-Hsin Chen, **Wei-Yu Chen**, Yu-Ting Chen, Bo-Cheng Tsai, Yu-Chiang Frank Wang, Min Sun, “No More Discrimination: Cross City Adaptation of Road Scene Segmenters”, in *ICCV 2017*. [\[PDF link\]](#)[\[Site\]](#)

[2] Wei-Jen Ko, Jheng-Ying Yu, **Wei-Yu Chen**, and Yu-Chiang Frank Wang, "Enhanced Canonical Correlation Analysis with Local Density for Cross-Domain Visual Classification", in *ICASSP 2017*. [\[PDF link\]](#)

[3] **Wei-Yu Chen**, Tzu-Ming Harry Hsu, Yao-Hung Hubert Tsai, Yu-Chiang Frank Wang, Ming-Syan Chen, “Transfer Neural Trees for Heterogeneous Domain Adaptation”, in *ECCV 2016*. [\[PDF link\]](#)

[4] Yao-Hung Hubert Tsai, Cheng-An Hou, **Wei-Yu Chen**, Yi-Ren Yeh and Yu-Chiang Frank Wang, “Domain-Constraint Transfer Coding for Imbalanced Unsupervised Domain Adaptation”, in *AAAI 2016*. [\[PDF link\]](#)

[5] Tzu-Ming Harry Hsu, **Wei-Yu Chen**, Cheng-An Hou, Yao-Hung Hubert Tsai, Yi-Ren Yeh and Yu-Chiang Frank Wang, “Unsupervised Domain Adaptation with Imbalanced Cross-Domain Data”, in *ICCV 2015*. [\[PDF link\]](#)

[6] **Wei-Yu Chen**, Tzu-Ming Harry Hsu, Cheng-An Hou, Yi-Ren Yeh and Yu-Chiang Frank Wang, “Connecting the dots without clues: Unsupervised domain adaptation for cross-domain visual classification.”, in *ICIP 2015*. [\[PDF link\]](#)

RESEARCH EXPERIENCE

Multimedia & Machine Learning Lab (Advisor: Dr. Yu-Chiang Frank Wang)

02/2014–present

Domain Adaptation of Road Scene Segmentation

Scene segmentation is the recognition and location of objects in a scene; road scene segmentation is the core technique in advanced driver assistance systems (ADAS). However, due to the diversity of city appearances around the world, it is difficult to segment scenes for all cities with training data from only one specific city. In this project, we solve this problem by using domain adaptation techniques to exploit information in unlabeled city scenes from Google Maps. [1]

Heterogeneous Domain Adaptation

Heterogeneous domain adaptation (HDA) focuses on transferring classifier knowledge to different problem domains, for instance using text features to enhance image recognition accuracy. To solve the challenging HDA problems, existing approaches typically choose a domain-invariant feature space. In our work [3], we jointly learn the feature space and recognition together by integrating with a neural network structure, and propose Transfer Neural Decision Forest and embedding loss to preserve structural consistency between cross-domain data.

(Imbalanced) Unsupervised Domain Adaptation

Unsupervised domain adaptation (UDA) concerns domain differences, such as discrepancies between real photos and internet images, by exceptionally observing unlabeled data in the target domain along with labeled data in the source domain. In our work [6], we exploit cross-domain data correspondences using both observed data similarity and labels transferred from the source domain.

However, most existing work assumes that the source domain consists of data from a single dataset, and that no more object classes are collected than are in the target domain. We propose two methods to remove the aforementioned assumptions: the first [5] is to use maximum mean discrepancy (MMD) to discover latent domains to exploit both label and structural information, the second [4] is to apply sparse coding with locality constraints to exploit subdomains.

Cross-Domain Visual Classification

Canonical correlation analysis (CCA) is a classical algorithm for cross-domain visual classification, such as person re-identification or recognition across different camera angles. To suppress outlier effects, we further exploit local density information observed from each domain. [2]

SELECTED TERM PROJECTS

Advanced Topics In Multimedia Analysis And Indexing

06/2016

Action recognition with SegNet [\[Video\]](#)

This project is an implementation of a convolutional neural network (CNN) based action recognition system. First we apply SegNet, a CNN structure for semantic segmentation, to segment human regions from images. Thereafter, we apply a model pre-trained on the PASCAL VOC action dataset to recognize human action.

Electrical Engineering Lab (Networking and Multimedia)

06/2015

Eureka [\[Video\]](#)

Eureka is a theft-proof device for bicycles. Using Wi-Fi, GPS and Bluetooth, the device informs your smartphone when your bicycle is moved and helps you to locate it. With Wi-Fi it sends messages, with GPS it locates the device, and with Bluetooth it can receive a signal from your smartphone to ring it.

Robotics

01/2014

Storage robot [\[PDF link\]](#)[\[Video\]](#)

This robot can understand simple command such as “deposit belongings” or “withdraw belongings”. On command, this robot moves to a shelf, grips a box, approaches users, and lets them deposit or withdraw their belongings. It then puts the box back and returns it to its original place. It integrates sound recognition, image processing, and robot arm control.

AWARDS & HONORS

Excellent Master Thesis Award

07/2017

Awarded for an excellent master thesis by The Chinese Image Processing & Pattern Recognition Society.

Garmin Scholarship

01/2017

Provided by Garmin to support EE/CS students; evaluated by Garmin engineers.

Viscovery Scholarship

09/2016

A scholarship won by popular vote upon presentation during the Viscovery Research Seminar on Computer Vision and Deep Learning.

IEEE Signal Processing Cup 2015, Tenth Place

02/2015

A competition to analyze heart rates during physical exercise using wrist-type photoplethysmographic (PPG) signals. Team **Taipei Amoeba** proposed an algorithm called the **Trajectory Space Circular Model** with an error of 4.89 beats per minute (BPM).

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| Department Representative to Receive Undergraduate Diploma Awarded to students with the top 5% GPA over all semesters. | 06/2015 |
| Presidential Award (2 times) , Department of Electrical Engineering, NTU Awarded to students with the top 5% GPA for the semester. | 09/2012, 02/2013 |
| EXTRACURRICULAR EXPERIENCE | |
| MSRA Summer Camp A summer camp held by Microsoft Research Asia. Participants selected from top universities in China and Taiwan. | 07/2014 |
| Book Editor Worked with Prof. Ping-Cheng Yeh to publish “Ping-Cheng Yeh’s Amazing Probability Course” (ISBN: 9789861371832). | 2014 Spring |
| RELEVANT COURSES | |
| Machine learning Artificial Intelligence (A+), Machine Learning (A-), Deep Learning (A+), Data Science (A+), Data Mining (A+), Genetic Algorithms (A+), Introduction to Digital Speech Processing (A+) | |
| Robotics Robotics (A+), Probabilistic Machine Perception (A+), Robot Perception and Learning (A+), Control Systems (A), Electrical Engineering Lab (Automatic Control) (A) | |
| Computer vision Digital Visual Effects (A), Rendering (A), Advanced Computer Vision (A+), Advanced Topics in Multimedia Analysis and Indexing (A) | |
| SKILLS | |
| Programming languages MATLAB, Python, C++, R | |
| Languages English (fluent, GRE 329, TOEFL 103), Mandarin Chinese (native), Japanese (moderate, JEPT N3) | |