

# YAO-HUNG HUBERT TSAI

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## RESEARCH INTERESTS

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I work on Deep Learning and its applications, especially on Mutli-Modal Statistical Learning, Transfer Learning, and Generative Learning.

## EDUCATION

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**Carnegie Mellon University**, Pittsburgh, PA, USA

Aug 2016 - May 2021

- Ph.D. in Machine Learning Department within School of Computer Science
- *Advised by Dr. Ruslan Salakhutdinov and Louis-Philippe Morency*
- GPA: 4.0/4.0

**National Taiwan University**, Taipei, Taiwan

Aug 2010 - Jun 2014

- B.S. in Electrical Engineering (graduated with Department Honors)
- Undergraduate Ceremony Representative
- *Advised by Dr. Yu-Chiang Frank Wang and Dr. Shao-Yi Chien*
- GPA: 4.17/4.3

## SELECTED PUBLICATIONS

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### Conference Publications

- [1] **Yao-Hung Hubert Tsai**, Liang-Kang Huang, and Ruslan Salakhutdinov. “Learning Robust Visual-Semantic Embeddings”, *International Conference on Computer Vision (ICCV)*, 2017.
- [2] Shih-Yen Tao, **Yao-Hung Hubert Tsai**, Yi-Ren Yeh, and Yu-Chiang Frank Wang. “Semantics-Preserving Locality Embedding for Zero-Shot Learning”, *British Machine Vision Conference (BMVC)*, 2017. (**Spotlight Presentation**)
- [3] Wei-Yu Chen, Tzu-Ming Harry Hsu, **Yao-Hung Hubert Tsai**, Yu-Chiang Frank Wang, and Ming-Syan Chen. “Transfer Neural Trees for Heterogeneous Domain Adaptation”, *European Conference on Computer Vision (ECCV)*, 2016.
- [4] **Yao-Hung Hubert Tsai**, Yi-Ren Yeh, and Yu-Chiang Frank Wang. “Learning Cross-Domain Landmarks for Heterogeneous Domain Adaptation”, *Computer Vision and Pattern Recognition (CVPR)*, 2016.
- [5] **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”, *Association for the Advancement of Artificial Intelligence (AAAI)*, 2016.
- [6] 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”, *International Conference on Computer Vision (ICCV)*, 2015.
- [7] Yuan-Ting Hsieh\*, Shih-Yen Tao\*, **Yao-Hung Hubert Tsai**, Yi-Ren Yeh, and Yu-Chiang Frank Wang. “Generalized Joint Distribution Adaptation on Heterogeneous Feature Space”, *International Conference on Multimedia & Expo (ICME)*, 2016. (\*equal contributions) (**Oral Presentation**)
- [8] **Yao-Hung Hubert Tsai**, Yi-Ren Yeh, and Yu-Chiang Frank Wang. “Heterogeneous Domain Adaptation with Label and Structure Consistency”, *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2016.
- [9] **Yao-Hung Tsai\***, Hung-Ming Hsu\*, Cheng-An Hou, and Yu-Chiang Frank Wang. “Person-specific Domain Adaptation with Applications to Heterogeneous Face Recognition”, *International Conference on Image Processing (ICIP)*, 2014. (\*equal contributions)
- [10] Po-Chen Wu, **Yao-Hung Tsai**, and Shao-Yi Chien. “Stable Pose Tracking from a Planar Target with an Analytical Motion Model in Real-time Applications”, *International Workshop on Multimedia Signal Processing (MMSP)*, 2014.

### Journal Publications

- [11] Wei-Yu Chen, Tzu-Ming Harry Hsu, **Yao-Hung Hubert Tsai**, Yu-Chiang Frank Wang, and Ming-Syan Chen. “Transfer Neural Trees: Heterogeneous Domain Adaptation and Beyond”, *IEEE Transactions on Image Processing (TIP)*, 2017.
- [12] Cheng-An Hou, **Yao-Hung Hubert Tsai**, Yi-Ren Yeh, and Yu-Chiang Frank Wang. “Unsupervised Domain Adaptation with Label and Structural Consistency”, *IEEE Transactions on Image Processing (TIP)*, 2016.

## Workshop and Preprints (Long Paper)

- [13] **Yao-Hung Hubert Tsai\***, Han Zhao\*, Ruslan Salakhutdinov, Geoff Gordon. “Learning from the Experience of Others: Approximate Empirical Bayes in Neural Networks”, *UAI Workshop on Uncertainty in Deep Learning (UAI UDL)/Submitted to International Conference on Learning Representations (ICLR)*, 2018. (\*equal contributions)
- [14] **Yao-Hung Hubert Tsai\***, Paul Pu Liang\*, Amir Zadeh, Louis-Philippe Morency, Ruslan Salakhutdinov. “Learning Factorized Multimodal Representations”, *arXiv:1806.06176 (arXiv)/Submitted to International Conference on Learning Representations (ICLR)*, 2018. (\*equal contributions)
- [15] Makoto Yamada\*, Denny Wu\*, **Yao-Hung Hubert Tsai**, Ichiro Takeuchi, Ruslan Salakhutdinov, Kenji Fukumizu. “Post Selection Inference with Incomplete Maximum Mean Discrepancy Estimator”, *arXiv:1802.06226 (arXiv)/Submitted to International Conference on Learning Representations (ICLR)*, 2018. (\*equal contributions)
- [16] **Yao-Hung Hubert Tsai**, Han Zhao, Ruslan Salakhutdinov, and Nebojsa Jojic. “Learning Markov Chain in Unordered Dataset”, *arXiv:1711.03167 (arXiv)/NIPS Time Series Workshop (NIPS TSW<sup>†</sup>)/Submitted to International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018. (†**Oral Presentation**)
- [17] **Yao-Hung Hubert Tsai** and Ruslan Salakhutdinov. “Improving One-Shot Learning through Fusing Side Information”, *arXiv:1710.08347 (arXiv)/NIPS Learning with Limited Labeled Data: Weak Supervision and Beyond (NIPS LLD)/Bay Area Machine Learning Symposium (BayLearn<sup>†</sup>)*, 2017. (†**Best Poster**)
- [18] Chih-Kuan Yeh, **Yao-Hung Hubert Tsai**, and Yu-Chiang Frank Wang. “Generative-Discriminative Variational Model for Visual Recognition”, *arXiv:1706.02295 (arXiv)*, 2017.

## Workshop and Preprints (Short Paper)

- [19] **Yao-Hung Hubert Tsai\***, Makoto Yamada\*, Denny Wu\*, Ruslan Salakhutdinov, Ichiro Takeuchi, Kenji Fukumizu. “Selecting the Best in GANs Family: a Post Selection Inference Framework”, *International Conference on Learning Representations Workshop (ICLRW)*, 2018. (\*equal contributions)
- [20] **Yao-Hung Hubert Tsai\***, Denny Wu\*, Yixiu Zhao\*, Makoto Yamada, Ruslan Salakhutdinov. “"Dependency Bottleneck" in Auto-encoding Architectures: an Empirical Study”, *arXiv:1802.05408 (arXiv)*, 2018. (\*equal contributions)

## RESEARCH & WORK EXPERIENCES

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Graduate Research Assistant</b> , Carnegie Mellon University                                                                                                                                                                                                                | <i>Aug 2016 - May 2021</i> |
| <ul style="list-style-type: none"><li>• Researching in Deep Learning and its applications, especially on Mutli-Modal Statistical Learning, Transfer Learning, and Generative Learning.</li><li>• <i>Advisor: Dr. Ruslan Salakhutdinov and Louis-Philippe Morency</i></li></ul> |                            |
| <b>Graduate Research Intern</b> , Allen Institute for Artificial Intelligence                                                                                                                                                                                                  | <i>May 2018 - Aug 2018</i> |
| <ul style="list-style-type: none"><li>• Working on Videos Common Sense Retrieval</li><li>• <i>Advisor: Dr. Santosh Kumar Divvala &amp; Dr. Ali Farhadi</i></li></ul>                                                                                                           |                            |
| <b>Visiting Scholar</b> , RIKEN AIP                                                                                                                                                                                                                                            | <i>Dec 2017 - Jan 2018</i> |
| <ul style="list-style-type: none"><li>• Researching in the intersection between Kernel and Deep Learning.</li></ul>                                                                                                                                                            |                            |
| <b>Graduate Research Intern</b> , Microsoft Research                                                                                                                                                                                                                           | <i>May 2017 - Aug 2017</i> |
| <ul style="list-style-type: none"><li>• Working on Deep Generative Models</li><li>• <i>Advisor: Dr. Nebojsa Jojic</i></li></ul>                                                                                                                                                |                            |
| <b>Research Assistant</b> , CITI, Academia Sinica                                                                                                                                                                                                                              | <i>Aug 2015 - Aug 2016</i> |
| <ul style="list-style-type: none"><li>• Working on Person Re-Identification, Domain Adaptation, and Transfer Learning</li><li>• <i>Advisor: Dr. Yu-Chiang Frank Wang</i></li></ul>                                                                                             |                            |
| <b>Second Lieutenant</b> , R.O.C. Air Force                                                                                                                                                                                                                                    | <i>Jul 2014 - Jul 2015</i> |
| <ul style="list-style-type: none"><li>• Compulsory Military Service in Taiwan</li></ul>                                                                                                                                                                                        |                            |
| <b>Undergraduate Research Assistant</b> , National Taiwan University                                                                                                                                                                                                           | <i>Sep 2012 - Jun 2014</i> |
| <ul style="list-style-type: none"><li>• Working on Heterogeneous Face Recognition, Augmented Reality, and Real-Time Pose Tracking</li><li>• <i>Advisor: Dr. Yu-Chiang Frank Wang and Dr. Shao-Yi Chien</i></li></ul>                                                           |                            |

## TEACHING EXPERIENCES

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|------------------------------------------------------------------------------------------|----------------------------|
| <b>Teaching Assistant</b> , Carnegie Mellon University                                   | <i>Aug 2017 - Jan 2018</i> |
| <ul style="list-style-type: none"><li>• Course: 10-707 Topics in Deep Learning</li></ul> |                            |

- *Instructor: Dr. Ruslan Salakhutdinov*

**Teaching Assistant**, CITI, Academia Sinica

*Aug 2015 - Aug 2016*

- Providing Deep Learning tutorials/short courses for undergrad/grad students

## ACADEMIC TALKS

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- [1] **Yao-Hung Hubert Tsai**. “Deep Multimodal Fusion for Time Series Data”, *Deep Purple Hackathon*, Jun 2018.
- [2] **Yao-Hung Hubert Tsai**. “Discover Orders in Unordered Datasets: Generative Markov Networks”, *NVIDIA GPU Technology Conference (GTC)*, Mar 2018.
- [3] **Yao-Hung Hubert Tsai**. “Beyonds Mutli-Modal Statistical Learning”, *MultiComp Lab Seminar*, Feb 2018.
- [4] **Yao-Hung Hubert Tsai**. “Improve Low-Shot Visual Recognition by Bridging Visual-Semantic Gap”, *RIKEN Machine Learning Seminar*, Jan 2018.
- [5] **Yao-Hung Hubert Tsai**. “Discovering Order in Unordered Datasets: Generative Markov Networks”, *Neural Information Processing Systems Time Series Workshop (NIPS TSW)*, Dec 2017.
- [6] **Yao-Hung Hubert Tsai et al.**. “Recover Temporal Information from Permuted RNA Sequences”, *Deep Purple Hackathon*, Nov 2017.
- [7] **Yao-Hung Hubert Tsai**. “Learning Visual and Semantic Embeddings for Low-Shot Setting”, *Taiwanese Computer Vision Online Meetup*, May 2017.

## ACADEMIC SERVICES

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**Reviewer:**

- Conferences: *ICML, NIPS, CVPR, AISTATS*
- Journals: *TIP*

## SELECTED HONORS & AWARDS

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<b>AI2 Intern Fellowship Award</b> , Allen Institute for Artificial Intelligence	<i>2018</i>
<b>Government Scholarship to Study Abroad (GSSA)</b> , Taiwan Ministry of Education	<i>2016/2017</i>
<b>Undergraduate Ceremony Representative</b> , National Taiwan University	<i>2014</i>
<b>Presidential Awards</b> , National Taiwan University	<i>2011/2012/2014</i>
<b>Best Tourism App Award</b> , Chunghwa Telecom Hami Apps Competition	<i>2014</i>
<b>Bronze Medal &amp; Outstanding Paper Award</b> , Altera Innovate Asia FPGA Design Competition	<i>2013</i>
<b>Direct Admission with Recommendation</b> , International Physics Olympiad Selection Camp	<i>2010</i>
<b>National Representative Honorable Mention</b> , International Physics Olympiad Selection Camp	<i>2009</i>
<b>1st Runner-Up/Third Prize</b> , Regional/National Physics Olympiad for Senior High School	<i>2009</i>
<b>Honorable Mention</b> , International Junior Science Olympiad Selection Camp	<i>2008</i>

## SKILLS

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<b>Toolbox/Software</b>	PyTorch, TensorFlow, Theano, Keras, Torch, Caffe, CUDA, cuDNN, L <sup>A</sup> T <sub>E</sub> X
<b>Programming Languages</b>	Python, MATLAB, R, C/C++, Lua, C#, JAVA, Verilog, JavaScript, HTML5