

Kuan-Hao Huang

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EDUCATION

- University of California, Los Angeles, CA, USA** Start From Sep. 2018
Ph.D. in Computer Science
– Advisor: Prof. Kai-Wei Chang
- National Taiwan University, Taipei, Taiwan** Sep. 2014 - Jun. 2016
M.S. in Computer Science and Information Engineering
– GPA: 4.11/4.3; Advisor: Prof. Hsuan-Tien Lin
- National Taiwan University, Taipei, Taiwan** Sep. 2010 - Jun. 2014
B.S. in Computer Science and Information Engineering
– GPA: 4.10/4.3 (major); 3.96/4.3 (overall)

RESEARCH INTERESTS

Machine Learning Algorithm and Theory

Designing machine learning algorithms with theoretical foundations

Machine Learning Applications

Designing practical machine learning approaches to specific applications

RESEARCH EXPERIENCE

- National Taiwan University - MSLab, Taipei, Taiwan** Sep. 2017 - Present
Research Assistant, Advisor: Prof. Shou-De Lin

Deep Generative Models for Images

- Design a novel framework of generative adversarial networks to generate images associated with multiple classes from images associated with only a single class

Memory-Augmented Neural Networks on One-Shot Learning

- Focus on new memory read and write mechanism for memory-augmented neural networks to improve performance on one-shot learning tasks

- National Taiwan University - CLLab, Taipei, Taiwan** Jun. 2012 - Jun. 2016
Research Assistant, Advisor: Prof. Hsuan-Tien Lin

Cost-Sensitive Multi-Label Classification

- The first work that studies the connection between cost-sensitive multi-label classification and non-linear embedding techniques
- Proposed an embedding that can represent the information of any given cost function to train a cost-sensitive multi-label classifier with better performance than state-of-the-art algorithms
- Derived the cost upper-bound to theoretically justify the proposed algorithm

Active Learning for Cost-Sensitive Multi-Class Classification

- Proposed an embedding view of multi-class classification that can consider all the boundaries from the *one-versus-all* view in the same time; adopted manifold learning to preserve the cost information in the distance measure of the embedding space
- Developed a method that can estimate the uncertainty of instance via embedding to formulate a new querying strategy that can query different instances according to different given costs

Contextual Bandit Problem under Piled-Reward Setting

- Converted the famous *linear upper confidence bound* algorithm to a more realistic algorithm under the piled-reward setting
- Designed the *pseudo rewards* to make the proposed algorithm achieve strategic exploration before receiving piled-rewards and have 5% improvement of rewards in the early rounds
- Analyzed the regret upper-bound under the piled-reward setting for the proposed algorithm

CONFERENCE PUBLICATIONS

- [1] Yao-Yuan Yang, **Kuan-Hao Huang**, Chih-Wei Chang, and Hsuan-Tien Lin. Cost-sensitive reference pair encoding for multi-label learning. In *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2018.
- [2] **Kuan-Hao Huang** and Hsuan-Tien Lin. A novel uncertainty sampling algorithm for cost-sensitive multiclass active learning. In *Proceedings of the IEEE International Conference on Data Mining (ICDM)*, 2016.
- [3] **Kuan-Hao Huang** and Hsuan-Tien Lin. Linear upper confidence bound algorithm for contextual bandit problem with piled rewards. In *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2016.

JOURNAL PUBLICATIONS

- [4] **Kuan-Hao Huang** and Hsuan-Tien Lin. Cost-sensitive label embedding for multi-label classification. *Machine Learning*, 2017. (*ECML PKDD 2017 Journal Track*).
- [5] Chun-Liang Li, Yu-Chuan Su, Ting-Wei Lin, Cheng-Hao Tsai, Wei-Cheng Chang, **Kuan-Hao Huang**, Tzu-Ming Kuo, Shan-Wei Lin, Young-San Lin, Yu-Chen Lu, Chun-Pai Yang, Cheng-Xia Chang, Wei-Sheng Chin, Yu-Chin Juan, Hsiao-Yu Tung, Jui-Pin Wang, Cheng-Kuang Wei, Felix Wu, Tu-Chun Yin, Tong Yu, Yong Zhuang, Shou-De Lin, Hsuan-Tien Lin, and Chih-Jen Lin. Combination of feature engineering and ranking models for paper-author identification in KDD Cup 2013. *Journal of Machine Learning Research*, 2015. (Extended first-place winner report of KDD Cup 2013 track 1).
- [6] Wei-Sheng Chin, Yong Zhuang, Yu-Chin Juan, Felix Wu, Hsiao-Yu Tung, Tong Yu, Jui-Pin Wang, Cheng-Xia Chang, Chun-Pai Yang, Wei-Cheng Chang, **Kuan-Hao Huang**, Tzu-Ming Kuo, Shan-Wei Lin, Young-San Lin, Yu-Chen Lu, Yu-Chuan Su, Cheng-Kuang Wei, Tu-Chun Yin, Chun-Liang Li, Ting-Wei Lin, Cheng-Hao Tsai, Shou-De Lin, Hsuan-Tien Lin, and Chih-Jen Lin. Effective string processing and matching for author disambiguation. *Journal of Machine Learning Research*, 2014. (Extended first-place winner report of KDD Cup 2013 track 2).

PREPRINTS

- [7] Hong-Min Chu, **Kuan-Hao Huang**, and Hsuan-Tien Lin. Dynamic principal projection for cost-sensitive online multi-label classification. *Preprint arXiv:1711.05060*, 2017. (under review of *ECML PKDD 2018 Journal Track*).

SELECTED AWARDS

Thesis Honorable Mention Award , Taiwanese Association for Artificial Intelligence	2016
Fourth Place , KDD Cup 2015	2015
Second Place , ICASSP Signal Processing Cup	2014
First Place , Track 1 of KDD Cup 2013	2013
First Place , Track 2 of KDD Cup 2013	2013
Presidential Award , National Taiwan University	2011

TEACHING EXPERIENCE

National Taiwan University , Taipei, Taiwan <i>Teaching Assistant, CSIE 5043: Machine Learning</i>	Fall 2013, Fall 2014, Fall 2015
National Taiwan University , Taipei, Taiwan <i>Teaching Assistant, CSIE 1212: Data Structure and Algorithm</i>	Spring 2013, Spring 2015

WORK EXPERIENCE

MixerBox, Taipei, Taiwan
Software Engineering Intern

Mar. 2016 - Jun. 2016

- Built a system that can automatically find popular singers based on recent search strings
- Improved the quality of auto-complete searching system by data cleaning

Appier, Taipei, Taiwan
Software Engineering Intern

Apr. 2015 - Jan. 2016

- Established a system that can automatically select attractive images of products for advertisement
- Used bandit algorithms to determine which ads should be displayed to improve *click-through rate*

MediaTek, Hsinchu, Taiwan
Software Engineering Intern

Jul. 2014 - Aug. 2014

- Trained an online multi-class classifier that can dynamically decide the best transmitting parameters of 4G LTE system to enhance 4% transmission quality