

# Hsuan-Tien Lin

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Last Updated: March 1, 2018

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## CURRENT POSITION

**Appier**, Taipei, Taiwan  
Chief Data Scientist February 2016–present

**National Taiwan University**, Taipei, Taiwan  
Professor, Department of Computer Science and Information Engineering August 2017–present  
Adjunct Professor, Graduate Institute of Networking and Multimedia August 2017–present

## PAST POSITION

**Appier**, Taipei, Taiwan  
Consultant May 2014–January 2016

**National Taiwan University**, Taipei, Taiwan  
Associate Professor, Department of Computer Science and Information Engineering August 2012–July 2017  
Adjunct Associate Professor, Graduate Institute of Networking and Multimedia August 2012–July 2017  
Assistant Professor, Department of Computer Science and Information Engineering August 2008–July 2012  
Adjunct Assistant Professor, Graduate Institute of Networking and Multimedia August 2008–July 2012

## EDUCATION

**California Institute of Technology**, Pasadena, CA, USA  
Ph.D. in Computer Science June 2008  
M.S. in Computer Science June 2005

**National Taiwan University**, Taipei, Taiwan  
B.S. in Computer Science and Information Engineering June 2001

## RESEARCH INTERESTS

- Machine Learning Theory: analyzing the generalization performance of learning systems
- Machine Learning Algorithms: improving existing algorithms including boosting, neural networks, support vector machines; proposing more efficient and more effective learning algorithms
- Machine Learning Applications: designing practical machine learning solutions that suit specific application needs

**BOOK**

- [1] Yaser S. Abu-Mostafa, Malik Magdon-Ismail, and **Hsuan-Tien Lin**, *Learning from Data: A Short Course* (AMLBook, March 2012), ISBN: 978-1600490064

**JOURNAL PAPERS**

- [13] Kuan-Hao Huang and **Hsuan-Tien Lin**, “Cost-Sensitive Label Embedding for Multi-Label Classification,” *Machine Learning* 106, nos. 9–10 (October 2017): 1725–1746
- [12] Yu-Ping Wu and **Hsuan-Tien Lin**, “Progressive  $k$ -Labelsets for Cost-Sensitive Multi-Label Classification,” *Machine Learning* 106, no. 5 (May 2017): 671–694
- [11] 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,” Extended first-place winner report of KDD Cup 2013 track 1, *Journal of Machine Learning Research* 16, no. 12 (December 2015): 2921–2947
- [10] Chun-Liang Li, Chun-Sung Ferng, and **Hsuan-Tien Lin**, “Active Learning Using Hint Information,” *Neural Computation* 27, no. 8 (August 2015): 1738–1765
- [9] Wei-Sheng Chin, Yu-Chin Juan, Yong Zhuang, 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,” Extended first-place winner report of KDD Cup 2013 track 2, *Journal of Machine Learning Research* 15, no. 10 (October 2014): 3037–3064
- [8] Yu-Xun Ruan, **Hsuan-Tien Lin**, and Ming-Feng Tsai, “Improving Ranking Performance with Cost-sensitive Ordinal Classification via Regression,” *Information Retrieval* 17, no. 1 (February 2014): 1–20
- [7] Chun-Sung Ferng and **Hsuan-Tien Lin**, “Multilabel Classification Using Error-correcting Codes of Hard or Soft Bits,” *IEEE Transactions on Neural Networks and Learning Systems* 24, no. 11 (November 2013): 1888–1900
- [6] Farbound Tai and **Hsuan-Tien Lin**, “Multilabel Classification with Principal Label Space Transformation,” *Neural Computation* 24, no. 9 (September 2012): 2508–2542
- [5] Yin-Hsi Kuo, Wen-Huang Cheng, **Hsuan-Tien Lin**, and Winston H. Hsu, “Unsupervised Semantic Feature Discovery for Image Object Retrieval and Tag Refinement,” *IEEE Transactions on Multimedia* 14, no. 4 (August 2012): 1079–1090
- [4] **Hsuan-Tien Lin** and Ling Li, “Reduction from Cost-sensitive Ordinal Ranking to Weighted Binary Classification,” *Neural Computation* 24, no. 5 (May 2012): 1329–1367

- [3] **Hsuan-Tien Lin** and Ling Li, “Support Vector Machinery for Infinite Ensemble Learning,” *Journal of Machine Learning Research* 9, no. 2 (February 2008): 285–312
- [2] **Hsuan-Tien Lin**, Chih-Jen Lin, and Ruby C. Weng, “A Note on Platt’s Probabilistic Outputs for Support Vector Machines,” *Machine Learning* 68, no. 3 (August 2007): 267–276
- [1] Shuo-Peng Liao, **Hsuan-Tien Lin**, and Chih-Jen Lin, “A Note on the Decomposition Methods for Support Vector Regression,” *Neural Computation* 14, no. 6 (June 2002): 1267–1281

## REFEREED CONFERENCE PAPERS

- [39] 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)*, accepted (2018)
- [38] Yong-Siang Shih, Kai-Yueh Chang, **Hsuan-Tien Lin**, and Min Sun, “Compatibility Family Learning for Item Recommendation and Generation,” in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)* (February 2018)
- [37] Cheng-Yu Hsieh, Yi-An Lin, and **Hsuan-Tien Lin**, “A Deep Model with Local Surrogate Loss for General Cost-sensitive Multi-label Learning,” in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)* (February 2018)
- [36] Kuo-Hsuan Lo and **Hsuan-Tien Lin**, “Cost-sensitive Encoding for Label Space Dimension Reduction Algorithms on Multi-label Classification,” in *Proceedings of the Conference on Technologies and Applications for Artificial Intelligence (TAAI)* (December 2017)
- [35] Yi-An Lin and **Hsuan-Tien Lin**, “Cyclic Classifier Chain for Cost-Sensitive Multilabel Classification,” in *Proceedings of the IEEE International Conference on Data Science and Advanced Analytics (DSAA)* (October 2017)
- [34] 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)* (December 2016), 925–930
- [33] Hong-Min Chu and **Hsuan-Tien Lin**, “Can Active Learning Experience Be Transferred?,” in *Proceedings of the IEEE International Conference on Data Mining (ICDM)* (December 2016), 841–846
- [32] Chih-Kuan Yeh and **Hsuan-Tien Lin**, “Automatic Bridge Bidding Using Deep Reinforcement Learning,” in *Proceedings of the 22nd European Conference on Artificial Intelligence (ECAI)* (September 2016), 1362–1369
- [31] Yu-An Chung, **Hsuan-Tien Lin**, and Shao-Wen Yang, “Cost-aware Pre-training for Multiclass Cost-sensitive Deep Learning,” in *Proceedings of the 25th International Joint Conference on Artificial Intelligence (IJCAI)* (July 2016), 1411–1417
- [30] Chun-Liang Li, **Hsuan-Tien Lin**, and Chi-Jen Lu, “Rivalry of Two Families of Algorithms for Memory-Restricted Streaming PCA,” in *Proceedings of the 19th*

- International Conference on Artificial Intelligence and Statistics (AISTATS)* (June 2016), 473–481
- [29] 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)*, vol. 1 (April 2016), 143–155
- [28] Sheng-Chi You and **Hsuan-Tien Lin**, “A Simple Unlearning Framework for Online Learning under Concept Drifts,” in *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, vol. 1 (April 2016), 115–126
- [27] Han-Jay Yang and **Hsuan-Tien Lin**, “A Practical Divide-and-Conquer Approach for Preference-Based Learning to Rank,” in *Proceedings of the Conference on Technologies and Applications for Artificial Intelligence (TAAI)*, Winner of best paper award (October 2015), 554–561
- [26] Wei-Ning Hsu and **Hsuan-Tien Lin**, “Active Learning by Learning,” in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)* (January 2015), 2659–2665
- [25] Ku-Chun Chou, Chao-Kai Chiang, **Hsuan-Tien Lin**, and Chi-Jen Lu, “Pseudo-reward Algorithms for Contextual Bandits with Linear Payoff Functions,” in *Proceedings of the Asian Conference on Machine Learning (ACML)*, vol. 39, JMLR Workshop and Conference Proceedings (November 2014), 344–359
- [24] **Hsuan-Tien Lin**, “Reduction from Cost-Sensitive Multiclass Classification to One-versus-One Binary Classification,” in *Proceedings of the Asian Conference on Machine Learning (ACML)*, vol. 39, JMLR Workshop and Conference Proceedings (November 2014), 371–386
- [23] Chun-Liang Li and **Hsuan-Tien Lin**, “Condensed Filter Tree for Cost-Sensitive Multi-Label Classification,” in *Proceedings of the International Conference on Machine Learning (ICML)* (June 2014), 423–431
- [22] Shang-Tse Chen, **Hsuan-Tien Lin**, and Chi-Jen Lu, “Boosting with Online Binary Learners for the Multiclass Bandit Problem,” in *Proceedings of the International Conference on Machine Learning (ICML)* (June 2014), 342–350
- [21] Yu-Cheng Chou and **Hsuan-Tien Lin**, “Machine Learning Approaches for Interactive Verification,” in *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), Part II*, vol. 8444, Lecture Notes in Computer Science (May 2014), 122–133
- [20] Ken-Yi Lin, Te-Kang Jan, and **Hsuan-Tien Lin**, “Data Selection Techniques for Large-scale RankSVM,” in *Proceedings of the Conference on Technologies and Applications for Artificial Intelligence (TAAI)* (December 2013), 25–30
- [19] Ya-Hsuan Chang and **Hsuan-Tien Lin**, “Pairwise Regression with Upper Confidence Bound for Contextual Bandit with Multiple Actions,” in *Proceedings of the Conference on Technologies and Applications for Artificial Intelligence (TAAI)* (December 2013), 19–24
- [18] Po-Lung Chen and **Hsuan-Tien Lin**, “Active Learning for Multiclass Cost-Sensitive Classification Using Probabilistic Models,” in *Proceedings of the Conference on*

- Technologies and Applications for Artificial Intelligence (TAAI)* (December 2013), 13–18
- [17] Wei-Yuan Shen and **Hsuan-Tien Lin**, “Active Sampling of Pairs and Points for Large-scale Linear Bipartite Ranking,” in *Proceedings of the Asian Conference on Machine Learning (ACML)*, vol. 29, JMLR Workshop and Conference Proceedings (November 2013), 388–403
- [16] Yao-Nan Chen and **Hsuan-Tien Lin**, “Feature-aware Label Space Dimension Reduction for Multi-label Classification,” in *Advances in Neural Information Processing Systems: Proceedings of the 2012 Conference (NIPS)* (December 2012), 1529–1537
- [15] Chun-Liang Li, Chun-Sung Ferng, and **Hsuan-Tien Lin**, “Active Learning with Hinted Support Vector Machine,” in *Proceedings of the Asian Conference on Machine Learning (ACML)*, vol. 25, JMLR Workshop and Conference Proceedings (November 2012), 221–235
- [14] Te-Kang Jan, Da-Wei Wang, Chi-Hung Lin, and **Hsuan-Tien Lin**, “A Simple Methodology of Soft Cost-sensitive Classification,” in *Proceedings of the 18th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)* (August 2012), 141–149
- [13] Shang-Tse Chen, **Hsuan-Tien Lin**, and Chi-Jen Lu, “An Online Boosting Algorithm with Theoretical Justifications,” in *Proceedings of the International Conference on Machine Learning (ICML)* (June 2012)
- [12] Chen-Wei Hung and **Hsuan-Tien Lin**, “Multi-label Active Learning with Auxiliary Learner,” in *Proceedings of the Asian Conference on Machine Learning (ACML)*, vol. 20, JMLR Workshop and Conference Proceedings (November 2011), 315–330
- [11] Chun-Sung Ferng and **Hsuan-Tien Lin**, “Multi-label Classification with Error-correcting Codes,” in *Proceedings of the Asian Conference on Machine Learning (ACML)*, vol. 20, JMLR Workshop and Conference Proceedings (November 2011), 281–295
- [10] Te-Kang Jan, **Hsuan-Tien Lin**, Hsin-Pai Chen, Tsung-Chen Chern, Chung-Yueh Huang, Bing-Cheng Wen, Chia-Wen Chung, Yung-Jui Li, Ya-Ching Chuang, Li-Li Li, Yu-Jiun Chan, Juen-Kai Wang, Yuh-Lin Wang, Chi-Hung Lin, and Da-Wei Wang, “Cost-sensitive Classification on Pathogen Species of Bacterial Meningitis by Surface Enhanced Raman Scattering,” in *Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine (BIBM)* (November 2011), 390–393
- [9] Yin-Hsi Kuo, **Hsuan-Tien Lin**, Wen-Huang Cheng, Yi-Hsuan Yang, and Winston H. Hsu, “Unsupervised Auxiliary Visual Words Discovery for Large-Scale Image Object Retrieval,” in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)* (June 2011), 905–912
- [8] Han-Hsing Tu and **Hsuan-Tien Lin**, “One-sided Support Vector Regression for Multiclass Cost-sensitive Classification,” in *Proceedings of the 27th International Conference on Machine Learning (ICML)* (June 2010), 1095–1102

- [7] Ling Li and **Hsuan-Tien Lin**, “Optimizing 0/1 Loss for Perceptrons by Random Coordinate Descent,” in *Proceedings of the 2007 International Joint Conference on Neural Networks (IJCNN)* (August 2007), 749–754
- [6] Ling Li and **Hsuan-Tien Lin**, “Ordinal Regression by Extended Binary Classification,” in *Advances in Neural Information Processing Systems : Proceedings of the 2006 Conference (NIPS)* (December 2006), 865–872
- [5] **Hsuan-Tien Lin** and Ling Li, “Large-Margin Thresholded Ensembles for Ordinal Regression: Theory and Practice,” in *Algorithmic Learning Theory (ALT)*, vol. 4264, Lecture Notes in Artificial Intelligence (October 2006), 319–333
- [4] **Hsuan-Tien Lin** and Ling Li, “Novel Distance-Based SVM Kernels for Infinite Ensemble Learning,” in *Proceedings of the 12th International Conference on Neural Information Processing (ICONIP)* (November 2005), 761–766
- [3] Ling Li, Amrit Pratap, **Hsuan-Tien Lin**, and Yaser S. Abu-Mostafa, “Improving Generalization by Data Categorization,” in *Knowledge Discovery in Databases (PKDD)*, vol. 3721, Lecture Notes in Computer Science (November 2005), 157–168
- [2] **Hsuan-Tien Lin** and Ling Li, “Infinite Ensemble Learning with Support Vector Machines,” in *Machine Learning: Proceedings of the 16th European Conference on Machine Learning (ECML)*, vol. 3720, Lecture Notes in Computer Science (October 2005), 242–254
- [1] Shuo-Peng Liao, **Hsuan-Tien Lin**, and Chih-Jen Lin, “A Note on the Decomposition Methods for Support Vector Regression,” in *Proceedings of the 2001 International Joint Conference on Neural Networks (IJCNN)* (July 2001), 1474–1479

## REFEREED WORKSHOP PAPERS

- [8] Chun-Yen Ho and **Hsuan-Tien Lin**, “Contract Bridge Bidding by Learning,” in *Proceedings of the Workshop on Computer Poker and Imperfect Information @ AAAI* (January 2015), 30–36
- [7] Todd G. McKenzie, Chun-Sung Ferng, Yao-Nan Chen, Chun-Liang Li, Cheng-Hao Tsai, Kuan-Wei Wu, Ya-Hsuan Chang, Chung-Yi Li, Wei-Shih Lin, Shu-Hao Yu, Chieh-Yen Lin, Po-Wei Wang, Chia-Mau Ni, Wei-Lun Su, Tsung-Ting Kuo, Chen-Tse Tsai, Po-Lung Chen, Rong-Bing Chiu, Ku-Chun Chou, Yu-Cheng Chou, Chien-Chih Wang, Chen-Hung Wu, **Hsuan-Tien Lin**, Chih-Jen Lin, and Shou-De Lin, “Novel Models and Ensemble Techniques to Discriminate Favorite Items from Unrated Ones for Personalized Music Recommendation,” in *Proceedings of the KDD Cup 2011 Workshop*, vol. 18, JMLR Workshop and Conference Proceedings, First-place winner report of KDD Cup 2011 track 2 (May 2012), 101–135
- [6] Po-Lung Chen, Chen-Tse Tsai, Yao-Nan Chen, Ku-Chun Chou, Chun-Liang Li, Cheng-Hao Tsai, Kuan-Wei Wu, Yu-Cheng Chou, Chung-Yi Li, Wei-Shih Lin, Shu-Hao Yu, Rong-Bing Chiu, Chieh-Yen Lin, Chien-Chih Wang, Po-Wei Wang, Wei-Lun Su, Chen-Hung Wu, Tsung-Ting Kuo, Todd G. McKenzie, Ya-Hsuan Chang, Chun-Sung Ferng, Chia-Mau Ni, **Hsuan-Tien Lin**, Chih-Jen Lin, and Shou-De Lin, “A Linear Ensemble of Individual and Blended Models for Music Rating Prediction,” in *Proceedings of the KDD Cup 2011 Workshop*, vol. 18, JMLR Workshop and

- Conference Proceedings, First-place winner report of KDD Cup 2011 track 1 (May 2012), 21–60
- [5] Hsiang-Fu Yu, Hung-Yi Lo, Hsun-Ping Hsieh, Jing-Kai Lou, Todd G. McKenzie, Jung-Wei Chou, Po-Han Chung, Chia-Hua Ho, Chun-Fu Chang, Yin-Hsuan Wei, Jui-Yu Weng, En-Syu Yan, Che-Wei Chang, Tsung-Ting Kuo, Yi-Chen Lo, Po Tzu Chang, Chieh Po, Chien-Yuan Wang, Yi-Hung Huang, Chen-Wei Hung, Yu-Xun Ruan, Yu-Shi Lin, Shou-De Lin, **Hsuan-Tien Lin**, and Chih-Jen Lin, “Feature Engineering and Classifier Ensemble for KDD Cup 2010,” in *Proceedings of the KDD Cup 2010 Workshop*, First-place winner report of KDD Cup 2010 (July 2010)
- [4] Farbound Tai and **Hsuan-Tien Lin**, “Multi-label Classification with Principle Label Space Transformation,” in *Proceedings of the 2nd International Workshop on learning from Multi-Label Data @ ICML ’10* (June 2010)
- [3] Hung-Yi Lo, Kai-Wei Chang, Shang-Tse Chen, Tsung-Hsien Chiang, Chun-Sung Ferng, Cho-Jui Hsieh, Yi-Kuang Ko, Tsung-Ting Kuo, Hung-Che Lai, Ken-Yi Lin, Chia-Hsuan Wang, Hsiang-Fu Yu, Chih-Jen Lin, **Hsuan-Tien Lin**, and Shou-De Lin, “An Ensemble of Three Classifiers for KDD Cup 2009: Expanded Linear Model, Heterogeneous Boosting, and Selective Naïve Bayes,” in *Proceedings of KDD-Cup 2009 competition*, vol. 7, JMLR Workshop and Conference Proceedings, Third-place winner report of KDD Cup 2009 slow track (June 2009), 57–64
- [2] **Hsuan-Tien Lin** and Ling Li, “Combining Ordinal Preferences by Boosting,” in *Proceedings of the Preference Learning Workshop in ECML/PKDD ’09* (September 2009), 69–83
- [1] **Hsuan-Tien Lin** and Ling Li, “Analysis of SAGE Results with Combined Learning Techniques,” in *Proceedings of the ECML/PKDD 2005 Discovery Challenge* (November 2005), 102–113

## OTHER PAPERS

- [9] Te-Kang Jan, Da-Wei Wang, Chi-Hung Lin, and **Hsuan-Tien Lin**, *Soft Methodology for Cost-and-error Sensitive Classification*, technical report (National Taiwan University and Academia Sinica, October 2017)
- [8] Wei-Yuan Shen and **Hsuan-Tien Lin**, *Active Sampling of Pairs and Points for Large-scale Linear Bipartite Ranking*, technical report (National Taiwan University, August 2017)
- [7] Kuan-Wei Wu, Chun-Sung Ferng, Chia-Hua Ho, An-Chun Liang, Chun-Heng Huang, Wei-Yuan Shen, Jyun-Yu Jiang, Ming-Hao Yang, Ting-Wei Lin, Ching-Pei Lee, Perng-Hwa Kung, Chin-En Wang, Ting-Wei Ku, Chun-Yen Ho, Yi-Shu Tai, I-Kuei Chen, Wei-Lun Huang, Che-Ping Chou, Tse-Ju Lin, Han-Jay Yang, Yen-Kai Wang, Cheng-Te Li, Shou-De Lin, and **Hsuan-Tien Lin**, *A Two-Stage Ensemble of Diverse Models for Advertisement Ranking in KDD Cup 2012*, technical report, First-place winner report of KDD Cup 2012 track 2 (National Taiwan University, August 2012)
- [6] Ku-Chun Chou and **Hsuan-Tien Lin**, *Balancing between Estimated Reward and Uncertainty during News Article Recommendation for ICML 2012 Exploration and*

- Exploitation Challenge*, technical report, First-place winner report of the Exploration and Exploitation Challenge @ ICML 2012 phase 1 (National Taiwan University, June 2012)
- [5] **Hsuan-Tien Lin**, Malik Madgon-Ismail, and Yaser S. Abu-Mostafa, *Teaching Machine Learning to a Diverse Audience: the Foundation-based Approach*, technical report, Presented in the Teaching Machine Learning Workshop @ ICML '12 (National Taiwan University, June 2012)
- [4] Ming-Feng Tsai, Shang-Tse Chen, Yao-Nan Chen, Chun-Sung Ferng, Chia-Hsuan Wang, Tzay-Yeu Wen, and **Hsuan-Tien Lin**, *An Ensemble Ranking Solution to the Yahoo! Learning to Rank Challenge*, technical report, Presented in the Workshop of Yahoo! Learning to Rank Challenge @ ICML '10 (National Taiwan University, June 2010)
- [3] **Hsuan-Tien Lin**, "From Ordinal Ranking to Binary Classification" (PhD diss., California Institute of Technology, 2008)
- [2] **Hsuan-Tien Lin**, "Infinite Ensemble Learning with Support Vector Machines" (master's thesis, California Institute of Technology, 2005)
- [1] **Hsuan-Tien Lin** and Chih-Jen Lin, *A Study on Sigmoid Kernels for SVM and the Training of non-PSD Kernels by SMO-type methods*, technical report (National Taiwan University, March 2003)

## SOFTWARE

- [1] Yao-Yuan Yang, Shao-Chuan Lee, Yu-An Chung, Tung-En Wu, Si-An Chen, and **Hsuan-Tien Lin**, *libact: Pool-based Active Learning in Python*, technical report (National Taiwan University, October 2017)

## TALKS

### Active Learning by Bandit Learning

A Symposium on Complex Data Analysis, Hsinchu, Taiwan May 2017

### Quick Tour of Machine Learning

Lecture Series of Data Science Enthusiasts in Taiwan, Taipei, Taiwan March 2017

Lecture Series of Data Science Enthusiasts in Taiwan, Taipei, Taiwan December 2015

### From Big Data to Artificial Intelligence

IEEE BigData 2016 Taipei Satellite Session (keynote talk), Taipei, Taiwan May 2016

### Learning for Big Data

Department of IM, National Taiwan University, Taipei, Taiwan April 2016

Annual Meeting of Data Science Enthusiasts in Taiwan, Taipei, Taiwan August 2015

IEEE BigData 2015 Taipei Satellite Session (keynote talk), Taipei, Taiwan, May 2015

### Machine Learning Overviews and Applications

Industrial Technology Research Institute, Hsinchu, Taiwan January 2016

Department of IM, Chang Jung Christian University, Tainan, Taiwan November 2015

Mediatek, Hsinchu, Taiwan April 2015

Marvell Taiwan, Hsinchu, Taiwan May 2014



**Active Learning by Learning**

Information Retrieval Workshop, Taipei, Taiwan December 2015  
 AI Forum, Kaohsiung, Taiwan, June 2015

**Label Space Coding for Multi-label Classification**

Institute of Statistical Science, Academia Sinica, Taipei, Taiwan September 2015  
 Intel Web Seminar, Taipei, Taiwan February 2015  
 Taiwan Society for Industrial and Applied Mathematics Annual Meeting, Kaohsiung, Taiwan, May 2015  
 Institute of Communications Engineering, National Tsing Hua University, Hsinchu, Taiwan April 2014  
 Department of CS, National Chiao Tung University, Hsinchu, Taiwan May 2013  
 Institute of Information Science, Academia Sinica, Taipei, Taiwan April 2012

**Competition-Based Final Projects for Enhancing Students' Motivations**

National Taiwan University Teaching Series, Taipei, Taiwan, June 2015

**Cost-sensitive Multiclass Classification Using One-versus-one Comparisons**

Institute of Statistics, National Tsing Hua University, Hsinchu, Taiwan December 2014  
 The 2nd International Conference on the Interface between Statistics and Engineering, Tainan, Taiwan June 2012  
 Institute of Information Science, Academia Sinica, Taipei, Taiwan August 2010  
 Department of EE, National Tsing Hua University, Hsinchu, Taiwan April 2010

**Basics of Machine Learning**

Big Data and Machine Learning Summer School, Hsinchu, Taiwan, July 2014

**Cost-sensitive Classification: Algorithms and Advances**

Asian Conference on Machine Learning 2013 Tutorial, Canberra, Australia  
 November 2013

**Cost-sensitive Multiclass Classification via Regression**

Department of Civil Engineering, National Taiwan University, Taipei, Taiwan  
 October 2013  
 Department of Computer Science and Information Engineering, National Central University, Taoyuan, Taiwan  
 October 2013  
 Department of Computer Science, National Cheng Chi University, Taipei, Taiwan  
 November 2011  
 Department of Computer Science and Information Engineering, National Taiwan Normal University, Taipei, Taiwan  
 December 2010  
 Research Center for Information Technology Innovation, Academia Sinica, Taipei, Taiwan  
 May 2010

**Feature-aware Label Space Dimension Reduction for Multi-label Classification**

AI Forum, Taipei, Taiwan, May 2013  
 Taiwan-Israel Joint Workshop on Artificial Intelligence, Tainan, Taiwan November 2012

**Deepening Learning Starts after Class**

National Taiwan University Teaching Series, Taipei, Taiwan, March 2013

**Research in the Computational Learning Laboratory: Ordinal Ranking, Cost-sensitive Classification and KDDCup 2011**

Plaxie, Taipei, Taiwan

November 2011

**Solutions and Experiences from KDD Cup 2011: A Linear Ensemble of Individual and Blended Models for Music Rating Prediction**

Research Center for Information Technology Innovation, Academia Sinica, Taipei, Taiwan

October 2011

**A Simple Algorithm for Cost-sensitive Classification**

Department of CSIE, National Taiwan University, Taipei, Taiwan

September 2008

**From Ordinal Ranking to Binary Classification**

Department of Applied Math, National Dong Hwa University, Hualian, Taiwan

February 2010

Department of CSIE, National Taiwan University of Science and Technology, Taipei, Taiwan

March 2009

Microsoft Research Asia, Beijing, China

February 2009

Department of CS, National Tsing Hua University, Hsinchu, Taiwan

March 2008

Department of CS, National Chiao Tung University, Hsinchu, Taiwan

March 2008

Department of CSIE, National Taiwan University, Taipei, Taiwan

March 2008

CS Department, California Institute of Technology, Pasadena, CA, USA

March 2008

**Automatic Ranking by Extended Binary Classification**

Institute of Information Science, Academia Sinica, Taipei, Taiwan

March 2007

EE Department, California Institute of Technology, Pasadena, CA, USA

November 2006

**Introduction to Support Vector Machines**

Speech Processing Laboratory, National Taiwan University, Taipei, Taiwan

November 2005

**Infinite Ensemble Learning with Support Vector Machinery**

Caltech 2nd Symposium on Vision and Learning,

California Institute of Technology, Pasadena, CA, USA

September 2005

**Introduction to Boosting and Joint Boosting**

Guest Lecture for EE148 Class: "Machine Learning for Computer Vision",

California Institute of Technology, Pasadena, CA, USA

April 2005

**TEACHING EXPERIENCE****National Taiwan University, Taipei, Taiwan***—with performance recognized by winning the outstanding teaching award of the university in 2011, see Selected Honors*

Instructor: Machine Learning Foundations—Algorithmic Foundations (Mandarin-teaching Massive Open Online Course on Coursera)

November 2017–present

Instructor: Machine Learning Foundations—Mathematical Foundations (Mandarin-teaching Massive Open Online Course on Coursera)

June 2017–present

Instructor: Machine Learning Foundations

Fall 17-18, Fall 16-17

Instructor: Machine Learning Techniques Spring 16-17

Instructor: Data Structures and Algorithms

Spring 15-16 (classes 01 & 02 as Guest Lecturer), Spring 14-15 (class 01),  
Spring 13-14 (classes 01 & 02), Spring 12-13 (class 01),  
Spring 11-12 (class 01), Spring 10-11 (classes 01 & 02)

Instructor: Fundamendal Object-Oriented Programming Fall 15-16

Instructor: Machine Learning

Fall 15-16, Fall 14-15, Fall 13-14, Fall 12-13, Fall 11-12, Fall 10-11, Fall 09-10, Fall 08-09

Instructor: Machine Learning Techniques (Mandarin-teaching Massive Open Online Course on Coursera) November 2015, December 2014

Instructor: Machine Learning Foundations (Mandarin-teaching Massive Open Online Course on Coursera) September 2015, September 2014, November 2013

Co-instructor: Computer Science and Information Technology

Spring 14-15 (Machine Learning session), Spring 13-14 (Machine Learning session),  
Fall 12-13 (Machine Learning session), Fall 09-10 (Machine Learning session)

Instructor: Object-Oriented Software Design

Spring 12-13, Spring 09-10 (classes 01 & 02), Spring 08-09 (class 02)

Co-instructor: Data Mining and Machine Learning: Theory and Practice

Spring 12-13, Spring 11-12, Spring 10-11, Spring 09-10

**Academia Sinica**, Taipei, Taiwan

Invited Lecturer on Kernel Machines (TIGP program)

Spring 13-14, Spring 12-13, Spring 11-12, Spring 10-11, Spring 09-10, Spring 08-09

## OTHER EXPERIENCE

**California Institute of Technology**, Pasadena, CA, USA

Research Assistant to Professor Yaser S. Abu-Mostafa July 2003–July 2008

**California Institute of Technology**, Pasadena, CA, USA

Teaching Assistant to Professor Yaser S. Abu-Mostafa: Learning Systems (CS156b)  
Winter 07-08

**California Institute of Technology**, Pasadena, CA, USA

Teaching Assistant to Professor Erik Winfree: Information and Complexity (CS129b)  
Winter 06-07

**California Institute of Technology**, Pasadena, CA, USA

Teaching Assistant to Professor Yaser S. Abu-Mostafa: Information and Complexity (CS129a)  
Fall 04-05, Fall 06-07

**National Taiwan University**, Taipei, Taiwan

Research Assistant to Professor Chih-Jen Lin March 2003–June 2003

<b>Defense Office</b> , Kinmen, Taiwan Personnel Officer (Second Lieutenant)	July 2001–March 2003
<b>National Taiwan University</b> , Taipei, Taiwan Research Assistant to Professor Chih-Jen Lin	September 2000–June 2001
<b>Websurf Company</b> , Taipei, Taiwan Project Manager	June 2000–May 2001
<b>Professional Technology Temple BBS System (PTT)</b> , Taipei, Taiwan Root and Core Administrator	January 1998–May 2001
<b>Attila Company</b> , Taipei, Taiwan Chief Technology Officer	December 1999–October 2000

## SELECTED HONORS

<b>Creative Young Scholar Award, Foundation for the Advancement of Outstanding Scholarship in Taiwan</b>	2017
<b>Outstanding Teaching Award, National Taiwan University</b>	2016, 2017
<b>Academic Contribution Award, EECS College of National Taiwan University</b>	2016
<b>Best Paper Award, TAAI 2015</b> (with H.-J. Yang)	2015
<b>T.-Y. Wu Memorial Award, National Science Council of Taiwan</b>	2013
<b>Outstanding Mentoring Award, National Taiwan University</b> (the most prestigious mentoring award in the university)	2013
<b>First Place, Track 2 of KDD Cup 2013</b> (with C.-L. Li, Y.-C. Su, T.-W. Lin, C.-H. Tsai, W.-C. Chang, K.-H. Huang, T.-M. Kuo, S.-W. Lin, Y.-S. Lin, Y.-C. Lu, C.-P. Yang, C.-X. Chang, W.-S. Chin, Y.-C. Juan, H.-Y. Tung, J.-P. Wang, C.-K. Wei, F. Wu, T.-C. Yin, T. Yu, Y. Zhuang, S.-D. Lin and C.-J. Lin)	2013
<b>First Place, Track 1 of KDD Cup 2013</b> (with W.-S. Chin, Y.-C. Juan, Y. Zhuang, F. Wu, H.-Y. Tung, T. Yu, J.-P. Wang, C.-X. Chang, C.-P. Yang, W.-C. Chang, K.-H. Huang, T.-M. Kuo, S.-W. Lin, Y.-S. Lin, Y.-C. Lu, Y.-C. Su, C.-K. Wei, T.-C. Yin, C.-L. Li, T.-W. Lin, C.-H. Tsai, S.-D. Lin and C.-J. Lin)	2013
<b>First Place, Track 2 of KDD Cup 2012</b> (with K.-W. Wu, C.-S. Ferng, C.-H. Ho, A.-C. Liang, C.-H. Huang, W.-Y. Shen, J.-Y. Jiang, M.-H. Yang, T.-W. Lin, C.-P. Lee, P.-H. Kung, C.-E. Wang, T.-W. Ku, C.-Y. Ho, Y.-S. Tai, I.-K. Chen, W.-L. Huang, C.-P. Chou, T.-J. Lin, H.-J. Yang, Y.-K. Wang, C.-T. Li and S.-D. Lin)	2012
<b>K.-T. Li Young Researcher Award, ACM Taipei Chapter and IICM</b>	2012
<b>Distinguished Teaching Award, National Taiwan University</b> (the most prestigious teaching award given to only 1% of the total faculty members in the university with a duration of five years)	2011

- First Place, Track 2 of KDD Cup 2011** 2011  
(with T. G. McKenzie, C.-S. Ferng, Y.-N. Chen, C.-L. Li, C.-H. Tsai, K.-W. Wu, Y.-H. Chang, C.-Y. Li, W.-S. Lin, S.-H. Yu, C.-Y. Lin, P.-W. Wang, C.-M. Ni, W.-L. Su, T.-T. Kuo, C.-T. Tsai, P.-L. Chen, R.-B. Chiu, K.-C. Chou, Y.-C. Chou, C.-C. Wang, C.-H. Wu, C.-J. Lin and S.-D. Lin)
- First Place, Track 1 of KDD Cup 2011** 2011  
(with P.-L. Chen, C.-T. Tsai, Y.-N. Chen, K.-C. Chou, C.-L. Li, C.-H. Tsai, K.-W. Wu, Y.-C. Chou, C.-Y. Li, W.-S. Lin, S.-H. Yu, R.-B. Chiu, C.-Y. Lin, C.-C. Wang, P.-W. Wang, W.-L. Su, C.-H. Wu, T.-T. Kuo, T. G. McKenzie, Y.-H. Chang, C.-S. Ferng, C.-M. Ni, C.-J. Lin and S.-D. Lin)
- First Place, KDD Cup 2010** 2010  
(with H.-F. Yu, H.-Y. Lo, H.-P. Hsieh, J.-K. Lou, T. G. McKenzie, J.-W. Chou, P.-H. Chung, C.-H. Ho, C.-F. Chang, Y.-H. Wei, J.-Y. Weng, E.-S. Yan, C.-W. Chang, T.-T. Kuo, Y.-C. Lo, P.-T. Chang, C. Po, C.-Y. Wang, Y.-H. Huang, C.-W. Hung, Y.-X. Ruan, Y.-S. Lin, S.-D. Lin and C.-J. Lin; also first place of all student teams)
- Third Place, Slow Track of KDD Cup 2009** 2009  
(with H.-Y. Lo, K.-W. Chang, S.-T. Chen, T.-H. Chiang, C.-S. Ferng, C.-J. Hsieh, Y.-K. Ko, T.-T. Kuo, H.-C. Lai, K.-Y. Lin, C.-H. Wang, H.-F. Yu, C.-J. Lin and S.-D. Lin)
- President's Award, National Taiwan University** 1997–2001  
(7 times, i.e., within the top 5% of the class consecutively in all 7 semesters)
- Second Prize, Trend Million-Dollar Internet Programming Contest** 2000  
(with L.-C. Kung, K.-P. Chen, G.-W. Liu, C.-Y. Wu, and J. Lin)
- Asia Champion, ACM International Collegiate Programming Contest** 1999  
(also worldwide 10th prize, with L.-C. Kung and K.-P. Chen)

## PROFESSIONAL ACTIVITIES

### Journal Paper Reviewer

- ACM Transactions on Intelligent Systems and Technology
- ACM Transactions on Knowledge Discovery from Data
- Advances in Artificial Neural Systems
- Advances in Operations Research
- Applied Stochastic Models in Business and Industry
- Artificial Intelligence
- Cognitive Computation
- Computational Statistics and Data Analysis
- Data Mining and Knowledge Discovery
- IEEE Computational Intelligence Magazine
- IEEE Transactions on Image Processing
- IEEE Transactions on Information Forensics and Security

- IEEE Transactions on Information Technology in Biomedicine
- IEEE Transactions on Knowledge and Data Engineering
- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Systems, Man and Cybernetics—Part B
- Journal of Artificial Intelligence Research
- Journal of Information Fusion
- Journal of Information Science and Engineering
- Journal of Machine Learning Research
- Knowledge-Based Systems
- Machine Learning
- Neural Networks
- Neurocomputing Journal
- International Journal of Business Intelligence and Data Mining
- International Journal of Computational Intelligence Research
- International Journal of Computational Vision and Robotics
- International Journal of Electrical Engineering
- International Journal of Remote Sensing
- Information Processing Letters
- Information Sciences
- Science China—Information Sciences
- Sensors
- The Computer Journal

#### **Conference Paper Meta Reviewer**

- International Joint Conferences on Artificial Intelligence (IJCAI) 2018
- Asian Conference on Machine Learning (ACML) 2014, 2015, 2016, 2017
- Conference on Neural Information Processing Systems (NIPS) 2015

#### **Conference Paper Reviewer**

- International Conference on Machine Learning (ICML) 2015, 2016, 2017, 2018
- Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)  
2014, 2015, 2016, 2017, 2018
- Artificial Intelligence and Statistics Conference (AISTATS) 2017, 2018
- AAI Conference on Artificial Intelligence (AAAI) 2016, 2017, 2018
- Conference on Neural Information Processing Systems (NIPS)  
2007, 2008, 2009, 2010, 2011, 2013, 2014, 2016, 2017
- Conference on Technologies and Applications of Artificial Intelligence (TAAI)  
2004, 2010, 2011, 2013, 2015, 2016, 2017

- ACM International Conference on Information and Knowledge Management (CIKM) 2017
- IEEE International Conference on Data Science and Advanced Analytics (DSAA) 2015, 2016, 2017
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2014, 2015, 2016, 2017
- International Joint Conferences on Artificial Intelligence (IJCAI) 2011, 2013, 2015, 2016
- International Conference on Big Data and Smart Computing (BigComp) 2014, 2015, 2016
- International Joint Conferences on Neural Networks (IJCNN) 2016
- International Conference on Data Mining (ICDM) 2015
- ASE International Conference on Social Informatics 2015
- European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD) 2011, 2014, 2015
- International Workshop on Machine Learning, Optimization and Big Data (MOD) 2015
- International Conference on Neural Information Processing (ICONIP) 2006, 2011, 2013, 2014
- Asian Conference on Machine Learning (ACML) 2011, 2012, 2013
- International Computer Symposium (ICS) 2012
- Annual Data Mining and Knowledge Discovery Competition (KDDCup) 2011
- Symposium on Cloud and Services Computing (SC2) 2011
- International Symposium on Information Theory and its Applications (ISITA) 2010
- Conference on Empirical Methods in Natural Language Processing (EMNLP) 2009
- IEEE World Congress on Computational Intelligence (WCCI) 2008
- IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2006
- International Conference on Intelligent Sensors, Sensor Network and Information Processing (ISSNIP) 2005

**Editor**

- Associate Editor, Journal of Information Science and Engineering (JISE) 2013–2015

**Proposal Reviewer**

- Research Projects of Ministry of Science and Technology of Taiwan (MOST) 2015, 2016, 2017
- Academia Collaboration Projects of Industrial Technology Research Institute of Taiwan (ITRI) 2017
- Research Projects of National Science Council of Taiwan (NSC) 2010, 2011, 2013, 2014

- Undergraduate Research Projects of National Science Council of Taiwan (NSC) 2013, 2014

### Conference Organizer

- Publicity Co-Chair, Asian Conference on Machine Learning (ACML) 2017
- Program Co-Chair, Conference on Technologies and Applications of Artificial Intelligence (TAAI) 2014
- Tutorial Co-Chair, Asian Conference on Machine Learning (ACML) 2014
- Registration Co-Chair, Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2014
- Registration Chair, Conference on Technologies and Applications of Artificial Intelligence (TAAI) 2013
- Local Arrangement Co-Chair, Symposium on Cloud and Services Computing (SC2) 2011

### Workshop Organizer

- Machine Learning Research in Taiwan: Challenges and Directions @ TAAI 2010  
(with Jane Hsu)

### Services for Taiwanese Association for Artificial Intelligence

- Council Member February 2015–present
- Secretary General January 2013–January 2015
- Thesis Award Reviewer 2009, 2012, 2013, 2015

### Services Related to Programming Contests

- Host Scientific Committee Member,  
International Olympiad in Informatics (IOI) 2014
- Program Committee Member,  
National Contest of High School Students on Informatics 2013
- Invited Lecturer,  
Training Camp of International Olympiad in Informatics (TOI) 2009, 2010, 2011, 2012
- Program Committee Member,  
National Contest for Private Universities (NCPU) 2012
- Program Committee Member,  
Cross-strait Programming Contest at NTHU 2009, 2012
- Program Committee Member,  
Project of Collegiate Programming: Practice, Training, Contest (PTC2),  
Ministry of Education of Taiwan (MOE) 2011-2012
- Program Committee Member,  
Asian Regional Site of International Collegiate Programming Contest (ICPC),  
National Sun Yat-Sen University 2010  
National Chiao-Tung University 2009  
National Taiwan University 2008



- Problem Designer and Reviewer,  
Project of Collegiate Programming: Practice, Training, Contest (PTC),  
Ministry of Education of Taiwan (MOE) 2009-2010

**Other Services**

- Organizing Committee Member, National Computer Science Forum 2012
- White Paper Co-author, AI sub-area, National Science Council of Taiwan 2010

**MEMBERSHIPS**

**The Institute of Electrical and Electronics Engineers (IEEE) and Computational Intelligence Society**

**Association for Computing Machinery (ACM) and Special Interest Group on Knowledge Discovery in Data (SIGKDD)**

**Institute of Information and Computing Machinery (IICM)**

**Taiwanese Association for Artificial Intelligence (TAAI)**