# Hsiao-Yu Fish Tung

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## Objective

Internship. Machine learning, Data analysis, Algorithm.

## Research Experience

**Spectral Methods for Indian Buffet Process Inference.**
*Hsiao-Yu Fish Tung, Alexander J. Smola (NIPS 2014) [5]*
Proposed an efficient spectral algorithm for non-parametric model inference. The algorithm provides superior accuracy and cheaper computation than comparable Variational Bayesian approach on a number of problems.Tensors for the Indian Buffet Process is derived and applied on different models. Reconstruction guarantees of the method is also provided.

**2013 KDD Cup Award, Track1&2 Champion.** [1] [3] [2]
*Algorithm@National Taiwan University, Advisor: Chih-Jen Lin*
Large-scale datasets which includes 250K authors and 2.5M papers from Microsoft Academic Search is used in the competition. Track1 aims at distinguishing whether the assigned papers are truly written by a given author with some training data. Track2 focuses on determining duplicated authors which is a unsupervised learning task.

**Novel Traffic Light Timing Adjustment Strategy Based On Genetic Algorithm.** [4]
*Hsiao-Yu Tung, Wei-Chiu Ma, and Tian-Li Yu (CEC 2013, Oral)*
Solved traffic signal timing optimization problem which aims at shortening the average traffic time using linear regression to learn from the global optimal solution obtained by GA. The new adjustment strategy outperforms recent optimization methods.

## Selected Projects

**Spectral Method for Hierarchical Dirichlet Processes.**
*Advisor: Alexander J. Smola*
Introduced a computationally and statistically efficient spectral algorithm for inferring parameters in HDPs using tensor decomposition. The generalized moments of multi-layer HDP are derived with theoretical guarantees for recovery accuracy. The algorithm is applied on large dataset: Wiki, News, Enron Email and proved to have better performance than standard spectral LDA.

**Identification of Songbird Species in Field Recordings**
*CMU ML Course Project, Advisor: Jeff Schneider*
Developed a software that will be used by the Carnegie Museum of Natural History, and possibly shared with other researchers, and educators to enhance the use of flight calls as a method to study the patterns of migratory songbirds.

**Kinect Game: Soup-Or-Fish-All**
*Attended 2013 Microsoft Imagine Cup, YouTube: goo.gl/OP1rJG*
Developed a multi-player posture-controlled Kinect fishing game with beautiful interface and different level of challenges.

**Android Game: CASTLE BUSTLE**
*NTU Networking and Multimedia Lab, YouTube: goo.gl/OP1rJG*
A multi-player tower defense games on nexus 7. My contribution is mainly on the professionally-designed interface and characters.

## Education

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| 2013 – 2015 (Expected) | **Carnegie Mellon University**<br>M.S. in Computer Science<br>Ave. GPA:4.0<br>Advisor: Prof. Alexander J. Smola |
| 2009-2013 | **National Taiwan University**<br>B.S. in Electrical Engineering<br>Ave. GPA: 3.95/4.0; Rank: 9% |

## Awards

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|---|---|
| 2014 | NIPS Travel Award |
| 2013 | KDD Cup Award, Track1& 2 Champion |
| 2013 | NTU Student Outstanding Performance Scholarship |
| 2012 | NTU President Award, rank 1/245 |
| 2011 | NTU President Award |

## Professional Service & Affiliation

- Reviewer of IEEE Transactions on Signal Processing
- Volunteer of Machine Learning Summer School 2014
- Member of Eta Kappa Nu

## Working Experience

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| 2013-present | **Research Assistant, CMU**<br>Advisor:Alexander J. Smola |
| 2014 summer | **Research Assistant, CMU**<br>Advisor:Aarti Singh |
| 2012 summer | **Software Engineer, MediaTek**<br>Home Entertainment group |
| 2011-2013 | **Research Assistant, NTU**<br>Advisor: Soo-Chang Pei, Tian-Li Yu |

## Coursework

**CMU selected courses**
Machine Learning, Statistical Machine Learning, Intermediate Statistics, Multimedia Database, Advanced Optimization and Randomized Methods

**NTU selected courses(Graduate Level)**
Machine Learning, Machine Learning Theorem and Implementation, Artificial Intelligence, Speech Signal Processing, Digital Signal Processing

## Skills

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|---|---|
| Programming | C • C++ • Matlab • Python • Java<br>JavaScript • HTML • CSS • PHP<br>Shell • MySQL • Hadoop • LaTeX |
| Language | Chinese(native), English (fluent),<br>Japanese, Korean |

## References


[1] W.-S. Chin, Y.-C. Juan, Y.-Zhuang, H.-Y. Tung Felix Wu, 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, H.-T. Lin, and C.-J. Lin. Effective string processing and matching for author disambiguation. *KDD CUP 2013 workshop, KDD*, 2013.

[2] W.-S. Chin, Y.-C. Juan, Y.-Zhuang, H.-Y. Tung Felix Wu, 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, H.-T. Lin, and C.-J. Lin. Effective string processing and matching for author disambiguation. *Journal of Machine Learning Research*, 2014.

[3] 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, Felix Wu, T.-C. Yin, T. Yu, Y. Zhuang, S. d. Lin, H.-T. Lin, and C.-J. Lin. Combination of feature engineering and ranking models for paper-author identification in kdd cup 2013. *KDD CUP 2013 workshop, KDD*, 2013.

[4] Hsiao-Yu Tung, Wei-Chui Ma, and Tian-Li Yu. Novel traffic light timing adjustment strategy based on genetic algorithm. *IEEE Congress on Evolutionary Computation*, 2014.

[5] Hsiao-Yu F. Tung and Alexander J. Smola. Spectral methods for indian buffet process inference. *NIPS*, 2014.