Haw-Shiuan Chang — Curriculum Vitae/Résumé

Information Extraction and Synthesis Laboratory (IESL) — *E-mail: hschang@cs.umass.edu*
Advisor: Andrew McCallum — *Website:* `http://people.umass.edu/hawshiuancha/`

Education

University of Massachusetts, Amherst (UMass Amherst), USA **Sept. 2015 – Current**
MS/PhD Student, Computer Science

- GPA: 3.98/4.00

National Yang Ming Chiao Tung University (NYCU), Taiwan **Sept. 2007 – June 2011**
Bachelor of Science, EECS Undergraduate Honors Program

- GPA: 95.25/100 (3.99/4.00)

System Development

OpenReview Reviewer-Paper Affinity Estimation **Feb. 2020 – Oct. 2020**

- My ensemble model is adopted by NeurIPS 2020-2021, ICLR 2021-2022, ICML, ACL ARR, ...

UMass TAC 2016 (Team Leader) **May 2016 – Sept. 2016**

- First place in TAC 2016 Spanish KBC (Knowledge Base Construction) and SF (Slot Filling)
- Outperform Stanford TAC 2016 English system in their crowdsourcing evaluation platform (`https://twitter.com/stanfordnlp/status/914256758482153472`)

Selected Publications

Multi-facet Embedding for Language Modeling

[1] H.-S. Chang*, R.-Y. Sun*, K. Ricci*, and A. McCallum, "Efficient BERT Ensemble using Multiple [CLS] Embeddings" *In preparation (Got positive experimental results)*

[2] H.-S. Chang*, Z. Yao*, A. Gon, and A. McCallum, "Softmax Bottleneck Makes GPT-2 Generate Incoherent and Repeated Text" *In preparation (Got positive experimental results)*

[3] H.-S. Chang, N. Agarwal, T. Wang, and A. McCallum, "Modeling Multi-mode Item Distributions in Sequential Recommendation" *In preparation (Got positive experimental results)*

[4] H.-S. Chang, and A. McCallum, "Softmax Bottleneck Makes Language Models Unable to Represent Multi-mode Word Distributions," *Annual Meeting of the Association for Computational Linguistics (ACL), 2022*

[5] H.-S. Chang, J. Yuan, M. Iyyer, and A. McCallum, "Changing the Mind of Transformers for Topically-Controllable Language Generation," *Conference of the European Chapter of the Association for Computational Linguistics (EACL Oral)*, 2021.

[6] R. Paul*, H.-S. Chang*, and A. McCallum, "Multi-facet Universal Schema," *Conference of the European Chapter of the Association for Computational Linguistics (EACL Oral)*, 2021.

[7] H.-S. Chang, A. Agrawal, and A. McCallum, "Extending Multi-Sense Word Embedding to Phrases and Sentences for Unsupervised Semantic Applications," *AAAI Conference on Artificial Intelligence (AAAI)*, 2021.

Active Learning and Crowdsourcing

[8] H.-S. Chang, S. Vembu, S. Mohan, R. Uppaal, and A. McCallum, "Using Error Decay Prediction to Overcome Practical Issues of Deep Active Learning for Named Entity Recognition," *Machine Learning*, 109, 1749–1778, 2020

[9] X.L. Dong, X. He, A. Kan, X. Li, Y. Liang, J. Ma, ... , H.-S. Chang, ... , "AutoKnow: Self-driving Knowledge Collection for Products of Thousands of Types," *ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD)*, 2020

[10] H.-S. Chang, C.-F. Hsu, T. Hoßfeld, and K.-T. Chen, "Active Learning for Crowdsourcing Multidimensional-QoE Modeling," *IEEE Transactions on Multimedia (TMM)*, 2018

[11] H.-S. Chang, E. Learned-Miller, and A. McCallum, "Active Bias: Training a More Accurate Neural Network by Emphasizing High Variance Samples," *Advances in Neural Information Processing Systems (NeurIPS)*, 2017

[12] H.-S. Chang, H.-J. Hsu and K.-T. Chen, "Modeling Exercise Relationships in E-Learning: A Unified Approach," *Int'l Conference on Educational Data Mining (EDM short)*, 2015.

Other Natural Language Processing Applications

[13] R. Seoh*, I. Birle*, M. Tak*, H.-S. Chang*, B. Pinette, and A. Hough, "Open Aspect Target Sentiment Classification with Natural Language Prompts," *Conference on Empirical Methods in Natural Language Processing (EMNLP short*), 2021.

[14] H.-S. Chang, Z. Wang, L. Vilnis, and A. McCallum, "Distributional Inclusion Vector Embedding for Unsupervised Hypernymy Detection," *Human Language Technology Conference of the North American Chapter of the Association of Computational Linguistics (HLT/NAACL)*, 2018

[15] H.-S. Chang, A. Agrawal, A. Ganesh, A. Desai, V. Mathur and A. McCallum, "Efficient Graph-based Word Sense Induction by Distributional Inclusion Vector Embeddings," *TextGraphs-12: the Workshop on Graph-based Methods for Natural Language Processing*, 2018.

[16] S. Mysore, E. Kim, E. Strubell, A. Liu, H.-S. Chang, S. Kompella, K. Huang, A. McCallum, and E. Olivetti, "Automatically Extracting Action Graphs from Materials Science Synthesis Procedures," *NIPS Workshop on Machine Learning for Molecules and Materials*, 2017.

[17] H.-S. Chang, A. Munir, A, Liu and J. T.-Z. Wei, A. Traylor, A. Nagesh, N. Monath, P. Verga, E. Strubell, A. McCallum "Extracting Multilingual Relations under Limited Resources: TAC 2016 Cold-Start KB Construction and Slot-Filling using Compositional Universal Schema," *TAC*, 2016

Computer Vision (Unsupervised Clustering and Matching)

[18] H.-S. Chang and Y.-C. F. Wang, "Optimizing the Decomposition of Multiple Foreground Cosegmentation," *Computer Vision and Image Understanding (CVIU)*, 141 pp. 18-27, 2015.

[19] H.-S. Chang and Y.-C. F. Wang, "Simple-to-Complex Discriminative Clustering for Hierarchical Image Segmentation," *Asian Conference on Computer Vision (ACCV)*, 2014.

[20] H.-S. Chang and Y.-C. F. Wang, "Superpixel-Based Large Displacement Optical Flow," *IEEE International Conference on Image Processing (ICIP)*, 2013.

[21] W.-T. Li, H.-S. Chang, K.-C. Lien, H.-T. Chang, and Y.-C. F. Wang, " Exploring Visual and Motion Saliency for Automatic Video Object Extraction," *IEEE Transactions on Image Processing (TIP)*, 22(7), pp. 2600-2610, 2013.

Service

Research Mentor of more than 40 students in UMass

- The collaboration leads to publication in EMNLP, NAACL, EACL, AAAI, TAC, Machine Learning, and 2 workshops
- Drafting the recommendation letters for 9 students

Reviewer

- Top reviewers in NeurIPS 2020 and ICLR 2021
- Reviewers in NIPS*3, ICLR*4, AAAI, ACL ARR, ACL, EMNLP, NAACL, SIGIR, TPAMI, Machine Learning, TMM, QoMEX, ICASSP, ICIP, ICPR, ...

Project Coordinator for IESL's $5.5m grant from the Chan Zuckerberg Initiative

Work Experience

Intern, *Amazon*, USA — **June 2019 – Sept. 2019**

- Project: Product Attribute Importance Estimation

Consultant - Researcher, *Chan Zuckerberg Initiative*, USA — **June 2018 – Sept. 2018**

- Project: Practical Active Learning

Teaching Assistant, *UMass Amherst*, USA — **Sept 2015 – June 2016**

Research Assistant, *CITI/IIS, Academia Sinica*, Taiwan — **July 2012 – July 2015**

- Research areas: Computer Vision, Active Learning, Educational Data Mining

Second Lieutenant, *Ministry of National Defense of Taiwan* — **Aug. 2011 – July 2012**

Undergraduate Honors

2011 Honorary Member of the Phi Tau Phi Scholastic Honor Society (top 1% in NYCU)
2007-2011 Exceptional Academic Performance Awards (7 times) (top 3% in EECS)
2010 Exchange Student Scholarship (26,000 USD) (top 1% in NYCU)
2010 Zhu Shun Zyxel Academic Merit Scholarship (4,000 USD) (top 1% in NYCU)
2007 Outstanding Incoming Student Scholarship (10,000 USD)

- Awarded for performing in top 0.2% out of ∼40,000 people on the college entrance examination