Bert Huang, Ph.D.

Assistant Professor, Department of Computer Science
Assistant Professor, Data Intensive Studies Center
Tufts University, Medford, MA 02155
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Research Interests

Machine learning, structured output learning, algorithmic fairness, weak supervision, probabilistic inference, graph mining, social media analysis, data science, big data, computational social science.

Education

Doctor of Philosophy, Computer Science — Columbia University, 2011

Thesis: *Learning with Degree-Based Subgraph Estimation*

Advised by Tony Jebara and Ansaf Salleb-Aouissi

Master of Science, Computer Science — Columbia University, 2006

Bachelor of Science, Computer Science, Philosophy — Brandeis University, 2004

Employment History

Assistant Professor. Tufts University Department of Computer Science. Tufts University Data Intensive Studies Center. — Summer 2020–Present

Assistant Professor. Virginia Tech Department of Computer Science. — Spring 2015–Spring 2020

Postdoctoral Research Associate. University of Maryland Dept. of Computer Science. — Fall 2011–Fall 2014

Graduate Research Assistant. Columbia University Dept. of Computer Science. — Fall 2006–Summer 2011

Research Intern. IBM Research, Thomas J. Watson Research Center. — Summer 2010

Lecturer. Columbia University Department of Computer Science. — Fall 2008–Spring 2010

Awards

Amazon Research Award. Measuring and Mitigating Intersectional Unfairness of Recommendation, 2019.

Excellence in Access and Inclusion Award. Virginia Tech Office of Services for Students with Disabilities, 2018.

Best Paper Award. IEEE/ACM Intl. Conference on Social Networks Analysis and Mining (ASONAM), 2017.

Best Paper Award. NeurIPS Workshop on Learning with Limited Labeled Data, 2017.

Reviewer Award. International Conference on Machine Learning (ICML), 2015.

Deployed Application Award. Conference on Innovated Applications of Artificial Intelligence (IAAI), 2015.

Andrew P. Kosoresow Memorial Award for Excellence in Teaching and Service. Columbia University Department of Computer Science, 2010. Granted for outstanding teaching of four undergraduate classes.

Service Award. Columbia University Department of Computer Science, 2009. Granted for serving as graduate student liaison to faculty.

Teaching

Tufts University Data Intensive Studies Center

Fall 2021. *Artificial Intelligence: Algorithms, Ethics, and Policy* — 67 students (undergrad and grad)
Spring 2021. *Machine Learning with Limited Annotation* — 19 students (undergrad and grad)
Fall 2020. *Fairness in Machine Learning*
Fall 2020. *From Basic Modeling to Deep Learning in PyTorch*

Virginia Tech Department of Computer Science: Classroom Courses

Spring 2020. *Causal Reasoning*	19 graduate students
Fall 2019. *Advanced Machine Learning*	125 graduate students
Spring 2019. *Machine Learning*	120 undergrad students
Fall 2018. *Introduction to Artificial Intelligence*	93 undergrad students
Spring 2018. *Optimization in Machine Learning*	31 graduate students
Fall 2017. *Machine Learning*	73 graduate and undergrad students
Spring 2017. *Data Analytics II*	49 graduate students
Fall 2016. *Introduction to Artificial Intelligence*	57 undergrad students
Spring 2016. *Graphical Models and Structured Prediction*	21 graduate students
Fall 2015. *Machine Learning*	27 graduate and undergrad students
Spring 2015. *Introduction to Artificial Intelligence*	32 graduate students

Virginia Tech Department of Computer Science: Independent Studies

Fall 2019. *Independent Study: Machine Learning Research*	2 undergrad students
Spring 2018. *Independent Study: Machine Learning Research*	1 undergrad student
Fall 2017. *Independent Study: Machine Learning Research*	2 undergrad students
Independent Study: AutoDrive Competition Team (co-supervised with Profs. Alfred Wicks, Steve Southward, and Lynn Abbott)	
Fall 2019	3 undergrad students
Spring 2019	3 undergrad students
Fall 2018	8 undergrad students
Spring 2018	9 undergrad students
Fall 2017	8 undergrad students

University of Maryland Department of Computer Science

Spring 2012. *Link Mining* (co-taught with Prof. Lise Getoor)	16 graduate students

Columbia University Department of Computer Science

Spring 2010. *Object Oriented Programming and Design in Java*	47 undergrad students
Fall 2009. *Data Structures in Java*	41 undergrad students
Spring 2009. *Data Structures and Algorithms*	52 undergrad students
Fall 2008. *Introduction to Computer Science and Programming in C*	51 undergrad students
Spring 2007. *Machine Learning* (as teaching assistant)	70 graduate students
Spring 2006. *Intro. to Computer Science and Programming in C* (as teaching assistant)	43 undergrad students

Publications

Asterisk (*) indicates author is a student researcher directly under my supervision.

Refereed Full Conference Papers

Heavily refereed papers in archival conference proceedings. Acceptance rates are listed where available.

1. *Constrained Label Learning for Weakly Supervised Learning*
   Chidubem Arachie, Bert Huang. International Conference on Uncertainty in Artificial Intelligencem 2021.

2. *Personalized Regularization Learning for Fairer Matrix Factorization*
   Sirui Yao, Bert Huang. Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), 2021. Acceptance rate: 20%.

3. *Woodbury Transformations for Deep Generative Flows*
   You Lu*, Bert Huang. Advances in Neural Information Processing Systems (NeurIPS), 2020. Acceptance rate: 20%.

4. *Attention-Based Graph Evolution*
   Shuangfei Fan*, Bert Huang. Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD). Pages 436–447. Acceptance rate: 21%.

5. *Structured Output Learning with Conditional Generative Flows*
   You Lu*, Bert Huang. AAAI Conference on Artificial Intelligence 2020. Pages 5005–5012. Acceptance rate: 20.6%.

6. *Adversarial Label Learning*
   Chidubem Arachie*, Bert Huang. AAAI Conference on Artificial Intelligence 2019. Pages 3183–3190. Acceptance rate: 16.2%.

7. *Block Belief Propagation for Parameter Learning in Markov Random Fields*
   You Lu*, Zhiyuan Liu, Bert Huang. AAAI Conference on Artificial Intelligence 2019. Pages 4448–4455. Acceptance rate: 16.2%.

8. *Reduced-Bias Co-Trained Ensembles for Weakly Supervised Cyberbullying Detection*
   Elaheh Raisi*, Bert Huang. International Conference on Computational Data and Social Networks (CSoNet) 2019. Oral presentation. Pages 293–306.

9. *Best-Choice Edge Grafting for Efficient Structure Learning of Markov Random Fields*
   Walid Chaabene*, Bert Huang. IEEE International Conference on Big Data 2018. Pages 16–25. Acceptance rate: 19%.

10. *Weakly Supervised Cyberbullying Detection using Co-trained Ensembles of Embedding Models*
    Elaheh Raisi*, Bert Huang. IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM) 2018. Oral presentation. Pages 479–486. Acceptance rate: 15%.

11. *Sparse-Matrix Belief Propagation*
    Reid Bixler*, Bert Huang. International Conference on Uncertainty in Artificial Intelligence (UAI) 2018. Pages 611–620. Acceptance rate: 31%.

12. *Beyond Parity: Fairness Objectives for Collaborative Filtering*
    Sirui Yao*, Bert Huang. Advances in Neural Information Processing Systems (NeurIPS) 2017. Pages 2921–2930. Acceptance rate: 21%.

13. *Cyberbullying Detection with Weakly Supervised Machine Learning*
    Elaheh Raisi*, Bert Huang. IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM) 2017. Oral presentation. Pages 409–416. Acceptance rate: 19%. **Best Paper Award**.

14. *Paired-Dual Learning for Training Hinge-Loss MRFs with Latent Variables*
    Stephen Bach, Bert Huang, Jordan Boyd-Graber, Lise Getoor. International Conference on Machine Learning (ICML) 2015. Oral presentation. Pages 381–390. Acceptance rate: 26%.

15. *The Benefits of Learning with Strongly Convex Approximate Inference*
    Ben London, Bert Huang, Lise Getoor. International Conference on Machine Learning (ICML) 2015. Oral presentation. Pages 410–418. Acceptance rate: 26%.

16. *Joint Models of Disagreement and Stance in Online Debate*
    Dhanya Sridhar, James Foulds, Bert Huang, Lise Getoor, Marilyn Walker. International Joint Conference on Natural Language Processing (ACL) 2015. Oral presentation. Pages 116–125. Acceptance rate: 25%.

17. *Unifying Local Consistency and MAX SAT Relaxations for Scalable Inference with Rounding Guarantees*
    Stephen Bach, Bert Huang, Lise Getoor. International Conference on Artificial Intelligence and Statistics (AISTATS) 2015. Pages 46–55. Oral presentation. Acceptance rate: 6%.

18. *Planned Protest Modeling in News and Social Media*
    Sathappan Muthiah, Bert Huang, Jaime Arredondo, David Mares, Lise Getoor, Graham Katz, Naren Ramakrishnan. Conference on Innovated Applications of Artificial Intelligence (IAAI) 2015. Pages 3920–3927. **Deployed Application Award**.

19. *Discovering Evolving Political Vocabulary in Social Media*
    Aravindan Mahendiran, Wei Wang, Jaime Arredondo, Bert Huang, Lise Getoor, David Mares, Naren Ramakrishnan. International Conference on Behavioral, Economic, and Socio-Cultural Computing (BESC) 2014. Pages 1–7. Acceptance rate: 16%.

20. *'Beating the News' With EMBERS: Forecasting Civil Unrest Using Open Source Indicators*
    Naren Ramakrishnan, Patrick Butler, Nathan Self, Rupinder Khandpur, Parang Saraf, Wei Wang, Jose Cadena, Anil Vullikanti, Gizem Korkmaz, Chris Kuhlman, Achla Marathe, Liang Zhao, Ting Hua, Bert Huang, Aravind Srinivasan, Khoa Trinh, Lise Getoor, Graham Katz, Andy Doyle, Chris Ackermann, Ilya Zavorin, Jim Ford, Kristen Summers, Youssef Fayed, Jaime Arredondo, Dipak Gupta, David Mares. ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2014. Pages 1799–1808. Acceptance rate: 15%.

21. *Learning Latent Engagement Patterns of Students in Online Courses*
    Arti Ramesh, Dan Goldwasser, Bert Huang, Hal Daumé III, Lise Getoor. AAAI Conference on Artificial Intelligence 2014. Oral presentation. Pages 1272–1278. Acceptance rate: 28%.

22. *PAC-Bayesian Collective Stability*
    Ben London, Bert Huang, Ben Taskar, Lise Getoor. International Conference on Artificial Intelligence and Statistics (AISTATS) 2014. Pages 585–594. Acceptance rate: 36%.

23. *A Hypergraph-Partitioned Vertex Programming Approach for Large-Scale Consensus Optimization*
    Hui Miao, Xiangyang Liu, Bert Huang, Lise Getoor. IEEE International Conference on Big Data 2013. Pages 563–568. Acceptance rate: 20%.

24. *Hinge-Loss Markov Random Fields: Convex Inference for Structured Prediction*
    Stephen Bach, Bert Huang, Ben London, Lise Getoor. Conference on Uncertainty in Artificial Intelligence (UAI) 2013. Pages 32–41. Acceptance rate: 31%.

25. *Collective Stability in Structured Prediction: Generalization from One Example*
    Ben London, Bert Huang, Ben Taskar, Lise Getoor. International Conference on Machine Learning (ICML) 2013. Oral presentation. Pages 828–836. Acceptance rate: 24%.

26. *A Flexible Framework for Probabilistic Models of Social Trust*
    Bert Huang, Angelika Kimmig, Lise Getoor, Jennifer Golbeck. International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP) 2013. Pages 265–273. Oral presentation. Acceptance rate: 24%.

27. *Learning a Distance Metric from a Network*
    Blake Shaw, Bert Huang, Tony Jebara. Neural Information Processing Systems (NeurIPS) 2011. Pages 1899–1907. Acceptance rate: 22%.

28. *Fast b-Matching via Sufficient Selection Belief Propagation*.
    Bert Huang, Tony Jebara. International Conference on Artificial Intelligence and Statistics (AISTATS) 2011. Pages 361–369. Acceptance rate: 28%.

29. *Collaborative Filtering via Rating Concentration*
    Bert Huang, Tony Jebara. International Conference on Artificial Intelligence and Statistics (AISTATS) 2010. Pages 334–341. Acceptance rate: 40%.

30. *Exact Graph Structure Estimation with Degree Priors*
    Bert Huang, Tony Jebara. International Conference on Machine Learning and Applications (ICMLA) 2009. Oral presentation. Pages 111–118. Acceptance rate 46%.

31. *Alive on Back-Feed Culprit Identification via Machine Learning*
    Bert Huang, Ansaf Salleb-Aouissi, Phil Gross. International Conference on Machine Learning and Applications (ICMLA) 2009. Special Session on Machine Learning in Energy Applications. Pages 725–730. Acceptance rate: 46%.

32. *Discovering Characterization Rules from Rankings*
    Ansaf Salleb-Aouissi, Bert Huang, David Waltz. International Conference on Machine Learning and Applications (ICMLA) 2009. Oral presentation. Pages 154–161. Acceptance rate: 46%.

33. *Maximum Entropy Density Estimation with Incomplete Presence-Only Data*
    Bert Huang, Ansaf Salleb-Aouissi. International Conference on Artificial Intelligence and Statistics (AISTATS) 2009. Acceptance rate: 40%.

34. *Vers des Machines Vecteurs Support "Actionnables": Une Approche Fonde sur le Classement*
    Ansaf Salleb-Aouissi, Bert Huang, David Waltz. Extraction et Gestion des Connaissances (EGC) 2008. Oral presentation. **Best Paper Award** (Prix EGC "Meilleur article académique").

35. *Loopy Belief Propagation for Bipartite Maximum Weight b-Matching*
    Bert Huang, Tony Jebara. International Conference on Artificial Intelligence and Statistics (AISTATS) 2007. Oral presentation. Pages 195–202. Acceptance rate: 13%.

Refereed Journal Papers

1. *A General Framework for Adversarial Label Learning*
   Chidubem Arachie, Bert Huang. Journal of Machine Learning Research, 2021.

2. *Preconditions for Guardianship Interventions in Cyberbullying: Incident Interpretation, Collective and Automated Efficacy, and Relative Popularity of Bullies*
   Leanna Ireland, James Hawdon, Bert Huang, Anthony Peguero. Computers in Human Behavior. Accepted for publication 2020.

3. *Machine Learning Applications in Orthopaedic Imaging*
   Vincent Wang, Carrie Cheung, Albert Kozar, Bert Huang. Journal of the American Academy of Orthopaedic Surgeons. Publish Ahead of Print.

4. *Recurrent Collective Classification*
   Shuangfei Fan*, Bert Huang. Knowledge and Information Systems. Vol. 60, No. 2. August 2019 (accepted May 2018, online August 2018). Pages 741–755.

5. *Interpretable Engagement Models for MOOCs using Hinge-loss Markov Random Fields*
   Arti Ramesh, Dan Goldwasser, Bert Huang, Hal Daumé III, Lise Getoor. IEEE Transactions on Learning Technologies. Online December 2018. Pages 1–15.

6. *Weakly Supervised Cyberbullying Detection with Participant-Vocabulary Consistency*
   Elaheh Raisi*, Bert Huang. Social Network Analysis and Mining. Vol. 8, No. 1. June 2018. Pages 1–17.

7. *Hinge-Loss Markov Random Fields and Probabilistic Soft Logic*
   Stephen H. Bach, Matthias Broecheler, Bert Huang, Lise Getoor. Journal of Machine Learning Research (JMLR). Vol. 18, No. 109. 2017. Pages 1–67.

8. *Capturing Planned Protests from Open Source Indicators*
   Sathappan Muthiah, Bert Huang, Jaime Arredondo, David Mares, Lise Getoor, Graham Katz, Naren Ramakrishnan. Artificial Intelligence Magazine. Vol. 37, No. 2, Summer Issue. 2016. Pages 63–75.

9. *Stability and Generalization in Structured Prediction*
   Ben London, Bert Huang, Lise Getoor. Journal of Machine Learning Research (JMLR). Vol. 17, No. 222. 2016. Pages 1–52.

10. *Network-Based Drug-Target Interaction Prediction with Probabilistic Soft Logic*
Shobeir Fakhraei, Bert Huang, Louiqa Raschid, Lise Getoor. IEEE/ACM Transactions on Computational Biology and Bioinformatics. Vol. 11, No. 5, October 2014. Pages 775–787. **Featured Article**.

11. *Semantic Model Vectors for Complex Video Event Recognition*
Michele Merler, Bert Huang, Lexing Xie, Gang Hua, Apostol Natsev. IEEE Transactions on Multimedia. Vol. 14, No. 1, February 2012. Pages 88–101.

12. *Machine Learning for the New York City Power Grid*
Cynthia Rudin, David Waltz, Roger Anderson, Albert Boulanger, Ansaf Salleb-Aouissi, Maggie Chow, Haimonti Dutta, Philip Gross, Bert Huang, Steve Ierome, Delfina Isaac, Arthur Kressner, Rebecca Passonneau, Axinia Radeva, and Leon Wu. IEEE Transactions on Pattern Analysis and Machine Intelligence. Vol. 34, No. 2, February 2012. Pages 328–345.

Book Chapters

1. *Weak Supervision and Machine Learning for Online Harassment Detection*
Bert Huang, Elaheh Raisi*. Editor: Jennifer Golbeck. *Online Harassment* (2018). Pages 5–28. Springer.

Refereed Papers at Workshops or Non-Archival Papers at Conferences

1. *Woodbury Transformations for Deep Generative Flows*
You Lu*, Bert Huang. ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models, 2020.

2. *Structured Output Learning with Conditional Generative Flows*
You Lu*, Bert Huang. ICML Workshop on Invertible Neural Networks and Normalizing Flows, 2019.

3. *Deep Generative Models for Generating Labeled Graphs*
Shuangfei Fan*, Bert Huang. ICLR Workshop on Deep Generative Models for Highly Structured Data, 2019.

4. *Conditional Labeled Graph Generation with GANs*
Shuangfei Fan*, Bert Huang. ICLR Workshop on Representation Learning on Graphs and Manifolds, 2019.

5. *An Adversarial Labeling Game for Learning from Weak Supervision*
Chidubem Arachie*, Bert Huang. NeurIPS Workshop on Smooth Games Optimization and Machine Learning, 2018.

6. *On the Need for Fairness in Financial Recommendation Engines*
Sirui Yao*, Bert Huang. NeurIPS Workshop on Challenges and Opportunities for AI in Finance, 2018.

7. *Smart HVAC Systems—Adjustable Airflow Direction*
Milad Abedi, Farrokh Jazizadeh, Bert Huang, Francine Battaglia. International Workshop on Intelligent Computing in Engineering, 2018.

8. *Co-trained Ensemble Models for Weakly Supervised Cyberbullying Detection*
Elaheh Raisi*, Bert Huang. NeurIPS Workshop on Learning with Limited Labeled Data: Weak Supervision and Beyond, 2017. **Best Paper Award**.

9. *New Fairness Metrics for Recommendation that Embrace Differences*
Sirui Yao*, Bert Huang. Workshop on Fairness, Accountability, and Transparency in Machine Learning (FATML), KDD 2017 Workshop.

10. *Training Iterative Collective Classifiers with Back-Propagation*
Shuangfei Fan*, Bert Huang. KDD Workshop on Mining and Learning with Graphs, 2016.

11. *Cyberbullying Identification Using Participant-Vocabulary Consistency*
Elaheh Raisi*, Bert Huang. #Data4Good: Machine Learning in Social Good Applications, ICML Workshop, 2016.

12. *Rounding Guarantees for Message-Passing MAP Inference with Logical Dependencies*
Stephen Bach, Bert Huang, Lise Getoor. NeurIPS Workshop on Discrete and Combinatorial Problems in Machine Learning (DISCML) 2014.

13. *On the Strong Convexity of Variational Inference*
Ben London, Bert Huang, Lise Getoor. NeurIPS Workshop on Advances in Variational Inference 2014.

14. *Probabilistic Soft Logic for Social Good*
Stephen Bach, Bert Huang, Lise Getoor. KDD Workshop on Data Science for Social Good 2014.

15. *Understanding MOOC Discussion Forums using Seeded LDA*
Arti Ramesh, Dan Goldwasser, Bert Huang, Hal Daumé III, Lise Getoor. ACL Workshop on Innovated Use of NLP for Building Educational Applications 2014.

16. *Uncovering Hidden Engagement Patterns for Predicting Learner Performance in MOOCs*
Arti Ramesh, Dan Goldwasser, Bert Huang, Hal Daume III, Lise Getoor. ACM Conference on Learning at Scale 2014. Work-in-Progress paper.

17. *PAC-Bayes Generalization Bounds for Randomized Structured Prediction*
Ben London, Bert Huang, Ben Taskar, Lise Getoor. NeurIPS 2013 Workshop on Perturbations, Optimization, and Statistics. Oral presentation.

18. *Large-Margin Structured Learning for Link Ranking*
Stephen Bach, Bert Huang, Lise Getoor. NeurIPS 2013 Workshop on Frontiers of Network Analysis. **Best Paper Award**.

19. *Collective Inference and Multi-Relational Learning for Drug-Target Interaction Prediction*
Shobeir Fakhraei, Bert Huang, Lise Getoor. NeurIPS 2013 Workshop on Machine Learning in Computational Biology.

20. *Modeling Learner Engagement in MOOCs using Probabilistic Soft Logic*
Arti Ramesh, Dan Goldwasser, Bert Huang, Hal Daumé III, Lise Getoor. NeurIPS 2013 Workshop on Data Driven Education.

21. *Collective Activity Detection Using Hinge-Loss Markov Random Fields*
Ben London, Samis Khamis, Stephen Bach, Bert Huang, Lise Getoor, Larry Davis. CVPR 2013 Workshop on Structured Prediction. Oral presentation.

22. *Fairness in Assignment Markets with Dual Decomposition*
Bert Huang. ICML 2013 Workshop on Peer Reviewing and Publication Models. Oral presentation.

23. *Learning Latent Groups with Hinge-Loss Markov Random Fields*
Stephen Bach, Bert Huang, Lise Getoor. ICML 2013 Workshop on Interactions between Inference and Learning (Inferning).

24. *Empirical Analysis of Collective Stability*
Bert Huang, Ben London, Ben Taskar, Lise Getoor. ICML 2013 Workshop on Structured Learning (SLG).

25. *Social Group Modeling with Probabilistic Soft Logic*
Bert Huang, Stephen Bach, Eric Norris, Jay Pujara, Lise Getoor. NeurIPS 2012 Workshop on Social Network and Social Media Analysis: Methods, Models, and Applications.

26. *Improved Generalization Bounds for Large-Scale Structured Prediction*
Ben London, Bert Huang, Lise Getoor. NeurIPS 2012 Workshop on Algorithmic and Statistical Approaches for Large Social Networks.

27. *Multi-Relational Weighted Tensor Decomposition*
Ben London, Thodoris Rekatsinas, Bert Huang, Lise Getoor. NeurIPS 2012 Workshop on Spectral Learning.

28. *A Short Introduction to Probabilistic Soft Logic*
    Angelika Kimmig, Stephen Bach, Matthias Broecheler, Bert Huang, Lise Getoor. NeurIPS 2012 Workshop on Probabilistic Programming: Foundations and Applications. Oral presentation.

29. *Probabilistic Soft Logic for Trust Analysis in Social Networks*
    Bert Huang, Angelika Kimmig, Lise Getoor, Jennifer Golbeck. UAI 2012 Workshop on Statistical Relational Artificial Intelligence (StaRAI).

30. *Query-Driven Active Surveying for Collective Classification*
    Galileo Namata, Ben London, Lise Getoor, Bert Huang. ICML 2012 Workshop on Mining and Learning with Graphs (MLG). Oral presentation.

31. *Learning a Degree-Augmented Distance Metric from a Network*
    Bert Huang, Blake Shaw, Tony Jebara. NeurIPS 2011 Workshop, Beyond Mahalanobis: Supervised Large-Scale Learning of Similarity. Oral presentation.

Refereed Workshop Presentations Accepted Based on Abstracts

1. *Machine Learning Approach For The Objective Sonographic Assessment Of Patellar Tendons In Collegiate Basketball Athletes*
   Carrie Cheung, You Lu, Al Kozar, Mary Mitchell, Jacob Turnbull, Bert Huang, Vincent Wang. Biomedical Engineering Society Annual Meeting, 2020, and Orthopaedic Research Society Annual Meeting, 2020.

2. *Using Hierarchical Clustering and Hoeffding Sampling to Label an Unlabeled Dataset*
   Alyssa Herbst*, Bert Huang. Women in Machine Learning Workshop, 2018.

3. *What Aspects of Training Data Affect Recommendation Fairness?*
   Sirui Yao*, Bert Huang. Women in Machine Learning Workshop, 2018.

4. *Adversarial Learning for Weak Supervision*
   Chidubem Arachie*, Bert Huang. Black in Artificial Intelligence Workshop, 2018.

5. *Machine Learning of a Priori Information in Optimal Estimation of Atmospheric Composition*
   Yun Dong, Bert Huang, Chidubem Arachie*, Elena Spinei, Natalya Kramarova, Krzysztof Wargan. American Geophysical Union (AGU) Fall Meeting, 2018.

6. *Integrating Machine Learning to Improve Optimal Estimation of Atmospheric Composition*
   Bert Huang, Chidubem Arachie*, Elena Spinei, Natalya Kramarova, Krzysztof Wargan. NASA Goddard Workshop on Artificial Intelligence, 2018.

7. *Machine Learning Approaches for Automated Detection of Cyberviolence*
   Elaheh Raisi*, Leanna Ireland, Bert Huang, James Hawdon, Anthony Peguero. Southern Sociological Society Annual Meeting, 2018.

8. *Establishing a Virtual Social Laboratory for Investigating Cyberviolence*
   Bert Huang, Anthony Peguero, James Hawdon. Southern Sociological Society Annual Meeting, 2018.

9. *The Detection of Patellar Tendinopathy Using Machine Learning Analysis of Ultrasound Images*
   Ellen Hammet, Grady Iliff, Sabeh Rezvani, Bert Huang, Al Kozar, Vincent Wang. Orthopaedic Research Society Annual Meeting, 2018.

10. *A Weakly Supervised Deep Model for Cyberbullying Detection*
    Elaheh Raisi*, Bert Huang. Women in Machine Learning Workshop, 2017.

11. *Fairness and Accuracy in Recommendation with Imbalanced Data Sparsity*
    Sirui Yao*, Bert Huang. Women in Machine Learning Workshop, 2017.

12. *Recurrent Collective Classification*
    Shuangfei Fan*, Bert Huang. International School and Conference on Network Science (NetSci) and Satellite on Machine Learning in Network Science (MLNS), 2017.

13. *Machine Learning for Detecting Detrimental Online Social Behavior*
Bert Huang, Elaheh Raisi*. Computing Community Consortium (CCC) Symposium on Computing Research: Addressing National Priorities and Societal Needs. May 2016.

14. *Collective Classification of Stance and Disagreement in Online Debate Forums*
Dhanya Sridhar, James Foulds, Bert Huang, Marilyn Walker, Lise Getoor. Bay Area Machine Learning Symposium 2014.

15. *Network Prediction with Degree Distributional Metric Learning*
Bert Huang, Blake Shaw, Tony Jebara. Interdisciplinary Workshop on Information and Decision in Social Networks (WIDS) 2011.

16. *Learning with Subgraph Estimation and Degree Priors*
Bert Huang, Tony Jebara. New York Academy of Sciences Machine Learning Symposium 2009.

17. *Maximum Likelihood Graph Estimation with Degree Priors*
Bert Huang, Tony Jebara. NeurIPS 2008 Workshop on Analyzing Graphs. Oral presentation.

18. *Approximating the Permanent with Belief Propagation*
Bert Huang, Tony Jebara. New York Academy of Sciences Machine Learning Symposium 2007.

19. *Maximum Entropy Density Estimation with Incomplete Data*
Bert Huang, Ansaf Salleb-Aouissi. New York Academy of Sciences Machine Learning Symposium 2007.

20. *Maximum Weight b-Matching via Belief Propagation*
Bert Huang, Tony Jebara. New York Academy of Sciences Machine Learning Symposium 2006.

Select Unrefereed Technical Reports

1. *Graph-Based Generalization Bounds for Learning Binary Relations*
Ben London, Bert Huang, Lise Getoor. University of Maryland Department of Computer Science Technical Report, 2013. http://arxiv.org/abs/1302.5348

2. *Multi-Relational Learning Using Weighted Tensor Decomposition with Modular Loss*
Ben London, Thodoris Rekatsinas, Bert Huang, Lise Getoor. University of Maryland Department of Computer Science Technical Report, 2013. http://arxiv.org/abs/1303.1733

3. *IBM Research TRECVID-2010 Video Copy Detection and Multimedia Event Detection System*
Apostol Natsev, John Smith, Matthew Hill, Gang Hua, Bert Huang, Michele Merler, Lexing Xie, Hua Ouyang, Mingyuan Zhou. Notebook Paper, National Institute of Standards and Technology, 2010.

4. *Approximating the Permanent with Belief Propagation*
Bert Huang, Tony Jebara. Columbia University Department of Computer Science Technical Report, 2009. http://arxiv.org/abs/0908.1769

Student Mentoring

As Advisor

Elaheh Raisi. Computer Science PhD student (**graduated 2019**). Now postdoc at Brown University.
Chidubem Arachie. Computer Science PhD student.
Shuangfei Fan. Computer Science PhD student.
You Lu. Computer Science PhD student.
Sirui Yao. Computer Science PhD student.

Reid Bixler. Computer Science MS student (**graduated 2018**). Now software engineer at Amazon.
Walid Chaabene. Computer Science MS student (**graduated 2017**). Now applied scientist at Amazon.
Alyssa Herbst. Computer Science BS/MS student.

As Independent Study Director

Alyssa Herbst. Fall 2017 and Spring 2018. Computer Science BS/MS student.
Andrew Marmon. Fall 2017. Computer Science BS student. Now data scientist for Slalom Consulting.
Colin Peppler. Fall 2019. Computer Science BS student.
Brook Tamir. Fall 2019. Computer Science BS student.

As Advising Committee Chair

Patrick Sullivan. CS MS. Graduated 2019. Joint committee with Lee Cooper and Tanushree Mitra.

As Advising Committee Member (Only completed degrees are listed.)

Saurabh Chakravarty. CS MS. Graduated 2017. Advised by Ed Fox.
Frank Claytor. CS MS. Graduated 2018. Advised by Francisco Servant.
Michael Cogswell. CS MS. Graduated 2016. Advised by Dhruv Batra.
Fatma Elzahraa Sobhy Eid. CS PhD. Graduated 2017. Advised by Lenwood Heath.
Jason Granstedt. ECE MS. Graduated 2017. Advised by Dhruv Batra.
Prakriti Gupta. ECE MS. Graduated 2017. Advised by Haibo Zeng.
Mohammad Shabbir Hasan. Graduated 2019. CS PhD. Advised by Liqing Zhang.
Ahmed Sobhy Elnady Ibrahim. ECE PhD. Graduated 2017. Advised by Lynn Abbott.
Spencer Jenkins. CS MS. Graduated 2019. Advised by Benjamin Jantzen.
Xiao Lin. ECE PhD. Graduated 2017. Advised by Devi Parikh.
Sanket Lokegaonkar. CS MS. Graduated 2018. Advised by Jia-Bin Huang and Naren Ramakrishnan.
Yufeng Ma. CS PhD. Graduated 2019. Advised by Patrick Fan and Ed Fox.
Aroma Mahendru. ECE MS. Graduated 2017. Advised by Dhruv Batra.
Azam Sadat Zavar Moosavi. CS PhD. Graduated 2018. Advised by Adrian Sandu.
Colin Shea-Blymyer. CS MS. Graduated 2019. Advised by Benjamin Jantzen.
Ali Asgar Ali Akbar Sohanghpurwala. ECE PhD. Graduated 2018. Advised by Peter Athenas.
Joseph Stamenkovich. ECE MS. Graduated 2019. Advised by Cameron Patterson.
Kayla Straub. ECE MS. Graduated 2016. Advised by Robert McGwier.
Xinfeng Xu. CS MS. Graduated 2019. Advised by Aditya Prakash.
Peng Zhang. ECE PhD. Graduated 2017. Advised by Devi Parikh.
Xuan Zhang. CS PhD. Graduated 2018. Advised by Patrick Fan and Ed Fox.
Yao Zhang. CS PhD. Graduated 2017. Advised by Aditya Prakash.
Wenjie Zhuang. CS MS. Graduated 2017. Advised by Patrick Fan.

Other Advising Roles

AutoDrive Challenge Faculty Mentor. SAE International's Collegiate Design Series three-year autonomous vehicle competition. 2017–present
PhD qualifying committee chair for data, information, knowledge, and libraries, 2017–2018, 2018–2019.
Virginia Tech Undergraduate Research in Computer Science (VTURCS) Symposium Faculty Judge, 2016.

Funded Projects

Data Mining Twitter to Improve Automated Vehicle Safety.
Funded through **U.S. Department of Transportation** Safe-D Program. $137,477. Additional matched funds from Virginia Tech.
PI: Anthony McDonald (Texas A&M). Co-PI: Bert Huang. 03/01/19–06/01/20

Measuring and Mitigating Intersectional Unfairness of Recommendation.
Amazon Research Award. $65,048.
PI: Bert Huang. 06/01/19–05/31/20

Development of Machine Learning Algorithms for Assessment of Tendon Injury from Ultrasound Images.
Virginia Tech Data and Decisions Seed Grant. $30,000.
PI: Vincent Wang. Co-PIs: Bert Huang and Albert Kozar. 03/01/19–09/01/19

Deep Learning Infrastructure for Precision Medicine with Multi-Omics Data.
Virginia Tech Data and Decisions Seed Grant. $30,000.
PI: Liqing Zhang. Co-PIs: Bert Huang and Zhi Sheng. 01/01/19–06/01/19

High-Performance Data Mining via Machine Learning for Analyzing Ultrasound Images
Virginia Tech Institute for Critical Technology and Applied Science Targeted Opportunity for Proposals. $150,000
PI: Vincent Wang. Co-PIs: Bert Huang, Wu Feng, and Albert Kozar.

Machine Learning Approaches for Automated Detection of Cyberviolence.
Virginia Tech Data and Decisions Seed Funding. $25,000.
PI: Bert Huang. Co-PIs: James Hawdon and Anthony Peguero. 01/01/18–06/01/18

Characterization of Adaptive Thermal Capacity for Energy Management in Smart Buildings.
Virginia Tech Institute for Critical Technology and Applied Science Junior Faculty Award. $40,000.
PI: Farrokh Jazizadeh. Co-PI: Bert Huang. 01/01/17–12/31/19

Equipment and Computing Grants

New General-Purpose Methods to Alleviate the Practical Costs of Machine Learning.
NVIDIA GPU Grant Program. One Titan V GPU worth $3,000. PI: Bert Huang. 2019

Integrating Deep Learning Concepts with Structured Prediction, Graph Mining, and Relational Learning.
Amazon AWS Cloud Credits for Research. $11,000 in AWS Cloud Computing Credits. PI: Bert Huang. 2018–2019

Machine Learning for Cyberbullying Detection.
CrowdFlower AI for Everyone Program. $5,000 in crowdsourced annotation credits on CrowdFlower platform (now Figure Eight). PI: Bert Huang. 2018

Research Talks

1. *Surviving the Growing Data Cost of Machine Learning*
   University of Virginia. Human Machine Intelligence Seminar. Online. September 2020.

2. *Speeding up Markov Random Field Inference and Learning*
   Northeastern University. DATA Lab Seminar. Online. September 2020.

3. *Surviving the Growing Data Cost of Machine Learning*
   American University Computer Science Seminar. Washington, D.C. October 2019.

4. *Adversarial Label Learning*
   Google Research Talk. Online and multiple locations, including Pittsburgh, PA, and Mountain View, CA. October 2019.

5. *Weakly Supervised Cyberbullying Detection using Co-trained Ensembles of Embedding Models*
   IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM). Barcelona, Spain. August, 2018.

6. *Detecting Cyberbullying with Low-Cost Machine Learning*
   Virginia Tech Discovery Analytics Center Innovation Seminar. April 2018.

7. *Weakly Supervised Learning for Detection of Online Harassment*
   Charlottesville Mobile App Designers and Developers MeetUp, hosted by WillowTree. December 2017.

8. *Weakly Supervised Learning for Detection of Online Harassment*
   University of Maryland Computational Linguistics and Information Processing Seminar. College Park, MD. November 2017.

9. *Cyberbullying Detection with Weakly Supervised Machine Learning*
   IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM) **Best Paper Presentation**. Sydney, Australia. August, 2017.

10. *A Weakly Supervised Approach for Adaptive Detection of Cyberbullying Roles*
    Invited talk for the International Workshop on Cybersafety, CIKM Workshop. Indianapolis, IN. October 2016.

11. *Cyberbullying Identification Using Participant-Vocabulary Consistency*
    #Data4Good: Machine Learning in Social Good Applications, ICML Workshop. June 2016.

12. *Paired-Dual Learning for Circumventing the Inference Bottleneck*
    New Perspectives for Relational Learning Workshop. Banff International Research Station. April 2015.

13. *Structured Machine Learning for the Complex World*. Virginia Tech Center for Embedded Systems for Critical Applications (CESCA) Seminar. April 2015.

14. *Probabilistic Soft Logic*. Virginia Tech Northern Virginia Campus Seminar. October 2014.

15. *Using Probabilistic Soft Logic to Model Group Behavior*. INFORMS Annual Meeting 2013. Invited Speaker Session on Virtual Communities and Collective Action. Minneapolis, MN. October 2013.

16. *Fairness in Assignment Markets with Dual Decomposition*. ICML Workshop on Peer Reviewing and Publishing Models, Atlanta, GA. June 2013.

17. *A Flexible Framework for Probabilistic Models of Social Trust*. International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP), Washington, DC. April 2013.

18. *Learning a Degree-Augmented Distance Metric from a Network*. NeurIPS Workshop, Beyond Mahalanobis: Supervised Large-Scale Learning of Similarity, Sierra Nevada, Spain. December 2011.

19. *Learning with Degree-Based Subgraph Estimation*. University of Maryland Department of Computer Science, College Park, MD. June 2011.

20. *Learning with Degree-Based Subgraph Estimation*. Auton Lab, Carnegie Mellon University Robotics Institute, Pittsburgh, PA. June 2011.

21. *Exact Graph Structure Estimation with Degree Priors*. International Conference on Machine Learning and Applications (ICMLA), Miami, FL. December 2009.

22. *Loopy Belief Propagation for Bipartite Maximum Weight b-Matching*. International Conference on Artificial Intelligence and Statistics (AISTATS), San Juan, Puerto Rico. March 2007.

Patents

1. *Machine Learning for Power Grids*
   Roger Anderson, Albert Boulanger, Cynthia Rudin, Ansaf Salleb-Aouissi, David Waltz, Maggie Chow, Haimonti Dutta, Philip Gross, Bert Huang, Steve Ierome, Delfina Isaac, Arthur Kressner, Rebecca Passonneau, Axinia Radeva, Leon Wu, Peter Hofmann, Frank Dougherty. The Trustees of Columbia University in the City of New York, 2012.

2. *b-Matching Using Sufficient Selection Belief Propagation*
   Tony Jebara, Bert Huang. The Trustees of Columbia University in the City of New York, 2012.

3. *Systems and Methods for Analyzing Spatiotemporally Ambiguous Events*
   Arun Hampapur, Bert Huang, Lexing Xie, Yada Zhu. International Business Machines Corporation (IBM), 2012.

4. *Network Information Methods Devices and Systems*
   Tony Jebara, Blake Shaw, Bert Huang. The Trustees of Columbia University in the City of New York, 2011.
5. *Belief Propagation for Generalized Matching*
   Tony Jebara, Bert Huang. The Trustees of Columbia University in the City of New York, 2010.
6. *Machine Optimization Devices, Methods, and Systems*
   Tony Jebara, Bert Huang. The Trustees of Columbia University in the City of New York, 2008.

Academic Service

Action Editor Assigning and managing reviewers for papers submitted to a journal.

Journal of Machine Learning Research (JMLR), 2015–2021.

Organizer

Fourth International Workshop on Computational Methods for Cybersafety. Co-located with The WebConference (WWW) 2019.

Third International Workshop on Computational Methods for Cybersafety. Co-located with The WebConference (WWW) 2018.

Second International Workshop on Computational Methods for Cybersafety. Co-located with WWW 2017.

Workshop on Deep Structured Prediction. Co-located with ICML 2017.

Eleventh Workshop on Mining and Learning with Graphs (MLG). Co-located with KDD 2013.

Conference Area Chair / Senior Program Committee Member Assigning and managing reviewing for papers submitted to a conference.

Neural Information Processing Systems (NeurIPS) 2014, 2017, 2018, 2019, 2020.

International Conference on Machine Learning (ICML) 2014, 2019, 2020, 2021.

Conference Program Committee Member Reviewing papers submitted to a conference.

International Conference on Machine Learning (ICML) 2012, 2013, 2015, 2016.

Uncertainty in Artificial Intelligence (UAI) 2010, 2011, 2012, 2013, 2014, 2015, 2016.

Neural Information Processing Systems (NeurIPS) 2010, 2016.

International Conference on Artificial Intelligence and Statistics (AISTATS) 2013, 2014, 2015.

ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2015.

International Joint Conference on Artificial Intelligence (IJCAI) 2015.

International Conference on Web Search and Data Mining (WSDM) 2014.

International Conference on Pattern Recognition Applications and Methods (ICPRAM) 2012.

IEEE International Symposium on Information Theory (ISIT) 2011.

National Science Foundation Peer Review Panelist

Division of Information and Intelligent Systems (IIS) 2013, 2014, 2016, 2019, 2021.

Journal Reviewer

Journal of Personalization Research; User Modeling and User-Adaptive Interaction, 2019.

Information Systems Frontiers, 2017, 2018.

Data Mining and Knowledge Discovery (DAMI) 2014, 2018.

Journal of Machine Learning Research (JMLR) 2011, 2012, 2013.

IEEE Transactions on Knowledge and Data Engineering (TKDE) 2011, 2012.

IEEE Transactions on Information Theory (T-IT) 2011.

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) 2011.

International Journal on Computational Statistics (CompStat) 2010, 2011.

Workshop Program Committee Member

Workshop on Bridging Game Theory and Deep Learning. Co-located with NeurIPS 2019.

Twelfth International Workshop on Mining and Learning with Graphs (MLG). Co-located with KDD 2016 and ICML 2018.

International Workshop on Learning Tractable Probabilistic Models (LTPM) 2014, 2018.

Conference External Reviewer

Symposium on Theoretical Aspects of Computer Science (STACS) 2013.

Extraction et Gestion des Connaissances (EGC) 2010.

Neural Information Processing Systems (NeurIPS) 2009.

Knowledge Discovery and Data Mining (KDD) 2009.

European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD) 2008.

Artificial Intelligence and Statistics (AISTATS) 2007.

Computer Vision and Pattern Recognition (CVPR) 2007.

Invited Workshop Discussant

Google Fairness in Machine Learning Workshop, 2018.

Activities Promoting Inclusion and Diversity in Computer Science

Department Diversity Committee Member. Served on a committee whose mission is to foster an inclusive and diverse community in the Department of Computer Science. My role included developing and conducting a climate survey to measure perceptions of inclusion within the department. Fall 2016–Spring 2019 (Virginia Tech). Fall 2020–present (Tufts).

Faculty Panelist. Society of Asian Scientists and Engineers Meet & Greet. Spoke to undergraduate students about careers in machine learning and computing. Spring 2018, Spring 2019, and Fall 2019.

Black in AI Graduate Application Mentor. Participated in an online panel with 48 students on advice for graduate school applications, led a breakout session on writing research statements, and provided one-on-one mentoring to one student preparing his application. Fall 2019.

Welcome Space Organizer. Co-organized a series of department open forums for students to discuss issues of feeling welcome or unwelcome in the department and its surrounding community. Led student discussion on videos created by Facebook on unconscious bias. Fall 2017 and Spring 2018.

Application Reviewer. National Center for Women & Information Technology (NCWIT) Award for Aspirations in Computing. Reviewed applications from women high school students to be recognized for their "aptitude and aspirations in technology and computing," providing them scholarship and internship opportunities and membership in the Aspirations in Computing network of peers. 2016, 2017, 2018, and 2019.

Guest Lecturer. Philosophy & Physical Computing Workshop. Presented about bias in machine learning to philosophy students interested in computing at a summer camp program organized by Prof. Benjamin Jantzen. Summers of 2017 and 2018.

STEP Luncheon Host. Hosted luncheons for incoming students in the Student Transition Engineering Program (STEP) of the Center for the Enhancement of Engineering Diversity (CEED). Summers of 2015 and 2018.

STEP Program Faculty Presenter. Gave presentations on machine learning, its role in modern society, and research directions for students in STEP. Summers of 2015 and 2018.

Galipatia Research Speaker. Spoke to first-year undergraduates about machine learning research. Fall 2017.

Hypatia-Galileo Slush Rush Mentoring. Met with first-year undergraduate women and men in a living-learning community to discuss their interest in computer science and STEM. Fall 2016.

Hypatia Research Speaker. Spoke to first-year undergraduate women about my experience in my career as a scientist, highlighting women in science who have had profound impacts on my career. Fall 2016.

Appearances in Popular Press and Other Media

YouTube video lecture channel. More than 500,000 views of my video lectures from graduate level courses on machine learning and artificial intelligence.

Los Angeles Police Department Opens Inquiry About Breitbart Ad
Sandra E. Garcia, The New York Times, September 2019.

Amazon Research Award Supports Developing Algorithms that Tackle Unfairness in Recommendation Engines
Barbara L. Micale, Virginia Tech Daily. April 2019.

Artificial Intelligence and the Future of Humans
Janna Anderson and Lee Rainie, Pew Research Center. December 2018.

AI Advancements Raise Questions
Gary Robertson, Virginia Business Magazine. June 2018.

Cambridge Analytica: Five Things to Watch
Morgan Chalfant and Ali Breland, The Hill. March 2018.

Virginia Tech Professor Builds Algorithm to Detect Traces of Cyberbullying
Izzy Rossi, News Editor, Collegiate Times. April 2017.

Detecting Cyber Bullying: But Can it Be Stopped?
Robbie Harris, WVTF Public Radio Interview. Radio Interview. March 2017.

Dispelling Five Common Myths About Cyberbullying
Ceci Leonard, Media Relations, Virginia Tech. February 2017.

Great Innovative Idea—Weakly Supervised Cyberbullying Detection in Social Media
Helen Wright, Computing Community Consortium (CCC) Blog. September 2016.