SHUAI HUANG

Curriculum Vitæ

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EDUCATIONAL HISTORY

Arizona State University, Tempe, AZ
Ph.D. Industrial Engineering
July 2012
Dissertation: Novel Statistical Models for Complex Data Structures

University of Science and Technology of China, Hefei, Anhui
School of Gifted Young
B.S. Statistics
July 2007

EMPLOYMENT HISTORY

University of Washington
Seattle, WA, USA
Associate Professor, Industrial and Systems Engineering, 09/2019 - present

University of Washington
Seattle, WA, USA
Assistant Professor, Industrial and Systems Engineering, 08/2014 – 09/2019

University of South Florida
Tampa, FL, USA
Assistant Professor, Industrial and Management Systems Engineering, 08/2012 – 07/2014

Arizona State University
Tempe, AZ, USA
Research Assistant, Industrial Engineering, 09/2007 – 07/2012

AWARDS AND HONORS

Best Paper Award (First Runner-up), for paper "Optimal Expert Knowledge Elicitation for Bayesian Network Structure Identification", IEEE Transactions on Automation Science and Engineering, 2019.

Award of Merit, Amazon Catalyst, for "Magic Mirror: A Smart Camera that Reads Your Face Everyday", 2017.

Honorable Mention, for paper "High-dimensional Process Monitoring and Change Point Detection using Embedding Distributions in Reproducing Kernel Hilbert Space (RKHS)", IIE Transactions Focused Issue on Quality and Reliability Engineering Best Applications Paper Award Competition, 2016.

Best Paper Award, for paper "A Transfer Learning Approach for Network Modeling", IIE Transactions Focused Issue on Quality and Reliability Engineering Best Paper Award Competition, 2014.

Outstanding Graduate Award, School of Computing, Informatics, and Decision Systems Engineering, Arizona State University, 2012.

University Graduate Fellowship Award, School of Computing, Informatics, and Decision Systems Engineering, Arizona State University, 2012.

AFFILIATIONS AND OTHER APPOINTMENTS

Adjunct Faculty in Department of Biomedical Informatics and Medical Education (*University of Washington*), 2016 – present

Member, eScience Institute (*University of Washington*), 2015 - present

Member, Integrated Brain Imaging Center (IBIC) (*University of Washington*), 2014 - 2018

RESEARCH INTEREST

Methodology: Machine learning; artificial intelligence; graphical models for complex system modeling; sparse learning; Bayesian deep models and variational inference; rule-based interpretable learning methods; collaborative learning; selective and adaptive sensing

Application: Healthcare and biomedicine, manufacturing, transportation.

TEACHING INTEREST

Big data analytics; deep learning; Bayesian computation; Graphical models; biomedical data analysis and informatics; healthcare decision making; and other statistics and machine learning-related classes.

PUBLICATIONS

Refereed archival journal publications
(Footnote: graduate students under my supervision[1])

1. Dang, X., **Huang, S**. and Qian, X., "Penalized Cox's Proportional Hazards Model for High-dimensional Survival Data with Grouped Predictors," *Statistics and Computing*, Vol. 31 (6), 1-27, 2021.

2. Yang, Y., **Huang, S**., Huang, W. and Chang, X., "Privacy Preserving Cost-Sensitive Learning," *IEEE Transactions on Neural Network and Learning Systems*, Vol. 32 (5), 2105-2116, 2021.

3. **Shakur, A**[1]., **Huang, S.**, Qian, X. and Chang, X., "SURVFIT: Doubly Sparse Rule Learning from Survival Data," *Journal of Biomedical Informatics* 117, 103691.

4. **Feng, J**[1]., **Zhu, X**[1]., Wang, F., **Huang, S**. and C, Chen., "A Learning Framework for Personalized Random Utility Maximization (RUM) Modeling of User Behavior," *IEEE Transactions on Automation Science and Engineering*, In press, 2021.

5. Xuan, D., **Huang, S.** and Qian, X., "Risk Factor Identification in Heterogeneous Disease Progression with L1-regularized Multi-State Models," *Journal of Health Informatics Research*, Vol. 5(1), 20-53, 2021.

6. **Zhu, X**[1]., **Feng, J**[1]., **Huang, S**. and C, Chen., "An online Updating Method for Time-Varying Preference Learning," *Transportation Research Part C: Emerging Technologies*, In press, 2020.

7. **Feng, J**[1]., **Huang, S.** and C, Chen., "Modeling User Interaction with app-based Reward System: A Graphical Model Approach Integrated with Max-margin Learning," *Transportation Research Part C: Emerging Technologies*, In press, 2020.

8. Li, M., Wu, Y., **He, Y**[1]., **Huang, S**. and Nair, A., "Sparse Inverse Covariance Estimation: A Data Mining Technique to Unravel Holistic Patterns among Business Practices in Firms", *Decision Sciences*, Vol. 51(4), 1046-1073, 2020.

9. He, K., **Huang, S.** and Qian, X., "Early Detection and Risk Assessment for Chronic Disease with Irregular Longitudinal Data Analysis", *Journal of Biomedical Informatics*, accepted, 2019.

10. **Samareh, A**[1]., Chang, X., Lober, B., Evans, H., Wang, Z., Qian, X. and **Huang, S**., "Artificial Intelligence Methods for Surgical Site Infection: Impacts on Detection, Monitoring, and Decision Making", *Surgical Infections*, Vol. 20(7), 546-554, 2019.

11. Jiang, Z., Ardywibowo, R., **Samareh, A**[1]., Evans, H., Lober, B., Chang, X., Qian, X., Wang, Z. and **Huang, S**., "A Roadmap for Automatic Surgical Site Infection Detection and Evaluation using User-Generated Incision Images", *Surgical Infections*, Vol. 20(7), 555-565, 2019.

12. **Feng, T**[1]., Davila, J., Liu, Y., Lin, S., Huang, S. and Wang, C., "Semi-supervised Topological Analysis for Elucidating Hidden Structures in High-Dimensional Transcriptome Datasets", *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, accepted, 2019.

13. **Feng, T**[1]., Qian, X., Liu, K. and **Huang, S**., "Dynamic Inspection of Latent Variables in State-Space Systems", *IEEE Transactions on Automation Science and Engineering*, Vol. 16(3), 1232-1243, 2019.

14. Wu, Z., **Huang, S**. and Xu, J., "Multi-stage Optimization Models for Individual Consistency and Group Consensus with Preference Relations", *European Journal of Operations Research*, Vol. 275(1), 182-194, 2019.

15. **Lin, Y**[1]., **Huang, S**., Simon, G. and Liu, S., "Cost-Effectiveness Analysis of Prognostics-based Depression Monitoring", *IIE Transactions on Healthcare Systems Engineering*, Vol. 9(1), 41-54, 2019.

16. **Lin, Y**[1]., Liu, S. and **Huang, S**., "Selective Sensing of a Heterogeneous Population of Units with Dynamic Health Conditions", *IISE Transactions*, Vol. 50(12), 1076-1088, 2018.

17. **Samareh, A**[1]., **Jin, Y**[1]., Wang, Z., Chang, X. and **Huang, S**., "Detect Depression from Communication: How Computer Vision, Signal Processing, and Sentiment Analysis Join Forces", *IIE Transactions on Healthcare Systems Engineering*, Vol. 8(3), 196-208, 2018.

18. Yang, H., Ke, C., Zhao, Y., **Huang, S**., Liu, J., "A Robust AUC Maximization Framework with Simultaneous Outlier Detection and Feature Selection for Positive-Unlabeled Classification", *IEEE Transactions on Neural Network and Learning Systems*, in press, 2018.

19. Ren, S., **Huang, S.**, Ye, J. and Qian, X., "Safe Feature Screening for Generalized Fused LASSO", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 40(12), 2992-3006, 2018.

20. **Lin, Y[1]**., **Huang, S**., Simon, G. and Liu, S., "Data-based Decision Rules to Personalize Depression Follow-up", *Scientific Report 8*, Article number: 5064, 2018.

21. Ardywibowo, R., **Huang, S**., Gui, S., **Xiao, C[1]**., Cheng, Y., Liu, J. and Qian, X., "Switching-State Dynamical Modeling of Daily Behavioral Data", *Journal of Health Informatics Research*, 2018, 2018.

22. **Samareh, A[1]**. and **Huang, S**., "DL-CHI: A Dictionary Learning based Contemporaneous Health Index for Degenerative Disease Monitoring", *EURASIP Journal of Advances in Signal Processing*, 2018: 17. 2018.

23. Chang, X., Sheng, J. and **Huang, S**., "Statistical Patterns of Human Mobility in Emerging Bicycle Sharing Systems", *PLoS ONE* 13(3): e0193795, 2018.

24. **Lin, Y[1]**., Liu, K., Byon, E., Liu, S. and **Huang, S**., "A Collaborative Learning Framework for Estimating A Heterogeneous Population of Regression Models", *IEEE Transactions on Reliability,* Vol. 67 (1), 328-341, 2018.

25. **Xiao, C[1]**., **Yan, J[1]**., Liu, J., Zeng, B. and **Huang, S**., "Optimal Expert Knowledge Elicitation for Bayesian Network Structure Identification", *IEEE Transactions on Automation Science and Engineering,* Vol. 15(3), 1163-1177, 2018.

26. Yu, M., Liu, B., Byon, E., **Huang, S**. and Jin, J.J., "Direction-dependent Power Curve Modeling for Multiple Interacting Wind Turbines", *IEEE Transactions on Power Systems*, Vol. 33 (12), 1725-1733, 2018.

27. Huang, Y.J., **Meng, Q[1]**., Evans, H., Lober, B., Cheng, Y., Qian, X., Liu, J. and **Huang, S**., "CHI: A Contemporary Health Index for Degenerative Disease Monitoring using Longitudinal Measurements", *Journal of Biomedical Informatics,* Vol. 73, 115-124, 2017.

28. Lu, W., Cheng, Y., **Xiao, C[1]**., Chang, S., **Huang, S**., Liang, B. and Huang, T., "Unsupervised Sequential Outlier Detection with Deep Architectures", *IEEE Transactions on Image Processing*, Vol. 26 (9), 4321-4330, 2017.

29. **Jin, Y[1]**., **Huang, S**., Wang, G. and Deng, H., "Diagnostic Monitoring of Multivariate Process via a LASSO-BN Formulation", *IISE Transactions*, Vol. 49 (9), 874-884, 2017.

30. Sun, H., **Huang, S**. and Jin, R., "Modeling of Complex Manufacturing Processes with Functional Variables via Novel Graphical Models", *IEEE Transactions on Automation Science and Engineering*, Vol. 14 (4), 1612-1621, 2017.

31. Ke, C., **Jin, Y[1]**., Evans, H., Lober, B., and **Huang, S**., Prognostics of Surgical Site Infections using Dynamic mHealth Data, *Journal of Biomedical Informatics*, Vol. 65, 22-33, 2017.

32. Acevedo-Calado, M., James, E.A., Morran, M., Pietropaolo, S., Ouyang Q., Arribas-Layton, D., Songini, M., Liguori, M., Casu, A., Auchus, R.J., **Huang, S**., Yu, L., Michels, A., Gianani, R. and Pietropaolo, M., "Identification of Unique Antigenic Determinants in the Amino Terminus of IA-2 (ICA512) in Childhood and Adult Autoimmune Diabetes: New Biomarker Development", *Diabetes Care*, Vol. 40 (4), 561-568, 2017.

33. **Jin, Y[1]**., Su, Y., Zhou, XH. and **Huang, S**., "Heterogeneous Multimodal Biomarker Analysis for Alzheimer's Disease via Bayesian Network", *EURASIP Journal of Bioinformatics and Systems Biology*, 2016:12, doi:10.1186/s13637-016-0046-9, 2016.

34. **Haghighi, M[1]**., Johnson, S., Qian, X., Lynch, K., Vehik, K., **Huang, S** and the TEDDY Study Group,. "A Comparison of Rule-based Analysis with Regression Methods in Understanding the Risk Factors for Study Withdrawal in a Pediatric Study", *Scientific Report*, doi:10.1038/srep30828, 2016.

35. **Lin, Y[1]., Huang. S**., Simon, G. and Liu, S., "Analysis of Depression Trajectory Patterns using Collaborative Learning", *Mathematical Bioscience*, Vol. 282, 191-203, 2016.

36. Grewal, R., **Haghighi, M[1]**., **Huang, S**., Smith, A., Cao, C., Lin, X., Lee, D., Teten, N., Pharm, H. and Selenica. "Identifying Biomarkers of Dementia Prevalent Among Amnestic MCI Ethnic Female Patients", *Alzheimer's Research & Therapy,* 8:43, , 2016.

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37. Sanger, P., van Ramshorst, G., Mercan, E., **Huang, S.**, Hartzler, A., Armstrong, C., Lordon, R., Lober, W. and Evans, H., "A Prognostic Model of Surgical Site Infection Incorporating Daily Objective Wound Assessments using Machine Learning", *Journal of the American College of Surgeons*, Vol. 223 (2), 259-270, 2016.

38. Rico, F., **Liu, Y**[1]., Martinez, D., **Huang, S.**, Zayas-Castro, J. and Fabri, P., "Preventable Readmission Risk Factors for Patients with Chronic Conditions", *Journal of Healthcare Quality*, Vol. 38 (3), 127-142, 2016.

39. Li, M., **Lin, Y**[1]., **Huang, S.**, Crossland, C., "The Use of Sparse Inverse Covariance Estimation for Relationship Detection and Theory Building in Strategic Management", *Strategic Management Journal*, Vol. 37 (1), 86-97, 2016.

40. **Haghighi, M**[1]., Smith, A., Morgan, D., Brent, S. and **Huang, S.**, "Identifying Cost-Effective Predictive Rules of Amyloid-Beta Level by Integrating Neuropsychological Tests and Plasma-based Markers", *Journal of Alzheimer's Disease*, Vol. 43(4), 1261-1270, 2015.

41. Xu, P., Liu, X., Hadley, D., **Huang, S.**, Krischer, J. and Beam, C., "Feature Selection using Bootstrapped ROC Curves", *Journal of Proteomics and Bioinformatics*, S9: 006. doi:10.4172/jpb.S9-006, 2014.

42. Hartney, M., **Liu, Y**[1]., Velanovich, V., Fabri, P., Marcet, J., Grieco, M., **Huang, S**. and Zayas-Castro, J., "Bounceback Branchpoints: Using Conditional Inference Trees to Analyze Readmissions", *Surgery*, Vol. 156 (4), 842-847, 2014.

43. Wang, R., **Huang, S.**, Li, J. and Chae, J., "Probing Thyroglobulin in Undiluted Human Serum based on Pattern Recognition and Competitive Adsorption of Proteins," *Applied Physics Letters*, Vol. 105 (14), 143703-143705, 2014.

44. Liu, K. and **Huang, S.**, "Integration of Data Fusion Methodology with Degradation Modeling Process to Improve Prognostics", *IEEE Transactions on Automation Science and Engineering*, Vol. 13 (1), 344-354, 2014.

45. **Liu, Y**[1]., Fabri, P., Zayas-Castro, J. and **Huang, S.**, "Learning High-dimensional Networks with Nonlinear Interactions by a Novel Tree-Embedded Graphical Model", *Pattern Recognition Letters*, Vol. 49(1), 207-213, 2014.

46. **Lin, Y**[1]., Qian, X., Krischer, J., Vehik, K., Lee, H.S. and **Huang, S.**, "A Rule-Based Prognostic Model for Type 1 Diabetes by Identifying and Synthesizing Baseline Profile Patterns", *PLoS ONE*, Vol. 9(6):e91095, 2014.

47. **Huang, S.**, Kong, Z.Y. and Huang, W.Z., "High-Dimensional Process Monitoring and Change Point Detection Using Embedding Distributions in Reproducing Kernel Hilbert Space (RKHS)", *IISE Transactions*, Vol. 46 (10), 999-1016, 2014.

48. Yampikulsakul, N., Byon, E., **Huang, S**. and Sheng, S.W., "Condition Monitoring of Wind Power System with Non-Parametric Regression Analysis", *IEEE Transactions on Energy Conversion*, Vol. 29(2), 288-299, 2014.

49. **Huang, S.**, Ye, J., Fleisher, A., Chen, K., Reiman, E., Wu, T., and Li, J., "A Sparse Structure Learning Algorithm for Bayesian Network Identification from High-dimensional Data", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 35(6), 1328-1342, 2013.

50. **Huang, S.**, Li, J., Chen, K., Wu, T., Ye, J., Wu, X., and Li, Y., "A Transfer Learning Approach for Network Modeling", *IIE Transactions,* 44, 915-931, 2012.

51. **Huang, S.**, Li, J., Sun, Li., Ye, J., Fleisher, A., Wu, T., Chen, K., and Reiman, E., "Learning Brain Connectivity of Alzheimer's Disease by Sparse Inverse Covariance Estimation", *NeuroImage*, 50, 935-949, 2011.

52. **Huang, S.**, Li, J., Lamb, G., Schmitt, M., and Fowler, J., "Multi-data Fusion for Enterprise Quality Improvement by a Multilevel Latent Response Model", *IISE Transactions*, 46 (5), 512-525, 2011.

53. Choi, S., **Huang, S.**, Li, J. and Chae, J., "Monitoring Protein Distributions based on Pattern Generated by Protein Adsorption Behavior in a Microfluidic Channel", *Lab-on-a-Chip*, 11, 3681-3688, 2011.

54. **Huang, S.**, Pan, R., and Li, J., "A Graphical Technique and Penalized Likelihood Method for Identifying Infant Failures", *IEEE Transactions on Reliability*, 59(4), 650-660, 2010.

55. Li, J., and **Huang, S.**, "Regression-based Process Monitoring with Consideration of Measurement Errors", *IISE Transactions*, 42(2), 146-160, 2009.

Conference proceedings and other non-journal articles

Fully refereed publications

1. **Shakur, A**[1]., Qian, X., Wang, Z., Mortazavi, B. and **Huang, S.**, "GPSRL: Learning Semi-parametric Bayesian Survival Rule Lists from Heterogeneous Patient Data," *The 25th International Conference on Pattern Recognition (ICPR 2020), 2020.*

2. Huo, Z., Pakbin, A., Chen, X., Hurley, N., Yuan, Y., Qian, X., Wang, Z., **Huang, S**. and Bobak, M., "Uncertainty Quantification for Deep Context-Aware Mobile Activity Recognition and Unknown Context Discovery", *The 23rd International Conference on Artificial Intelligence and Statistics (AISTAT 2020)*.

3. Ardywibowo, R., Zhao, G., Wang, Z., Mortazavi, B., **Huang, S**. and Qian, X., "Adaptive Activity Monitoring with Uncertainty Quantification in Switching Gaussian Process Models", *The 22nd International Conference on Artificial Intelligence and Statistics (AISTAT 2019), (paper acceptance rate 32.4 %).*

4. Wang, Z., **Huang, S.**, Zhou, J. and T, Huang., "Doubly Sparsifying Network and Its Applications in Brain Signal Processing", *Proceedings of International Joint Conference on Artificial Intelligence (IJCAI) 2017. (paper acceptance rate 21.8 %).*

5. Nie, Z., Lin, B., **Huang, S.**, Ramakrishnan, N., Fan, W. and Ye, J. "Pruning Decision Trees via Max-Heap Projection", *The SIAM International Conference on Data Mining (SDM 2017),* Apr. 27 – Apr. 29, 2017, Vancouver, CA. *(paper acceptance rate 25.9 %).*

6. Cheng, B., Wang, Z., Zhang, Z., Li, Z., Liu, D., Yang, J., **Huang, S**. and Huang, T.S., "Robust Emotion Recognition from Low Quality and Low Bit Rate Video: A Deep Learning Approach", *The Seventh International Conference on Affective Computing and Intelligent Interaction (ACII 2017),* Oct 23-26, San Antonio, Texas, 2017.

7. Yang, H., Huang, Y., Tran, L., Liu, J. and **Huang, S**. "On Benefits of Diversity Selection via Bilevel Exclusive Sparsity," *Conference on Computer Vision and Pattern Recognition (CVPR 2016),* June 27 – June 30, Las Vegas, Nevada, 2016. *(paper acceptance rate 29.9 %).*

8. **Lin, Y**[1]., Liu, K., Byon, E., Qian, X., **Huang, S**., "Domain-Knowledge Driven Cognitive Degradation Modeling for Alzheimer's Disease", *The SIAM International Conference on Data Mining (SDM 2015),* Apr. 30 – May 2, 2015, Vancouver, CA. *(invited for poster presentation, historical paper acceptance rate < 25 %).*

9. Ren, S., **Huang, S.**, Papademetris, X., Onofrey, J. and Qian, X., "A Scalable Algorithm for Structured Kernel Feature Selection," *The 18th International Conference on Artificial Intelligence and Statistics (AISTAT 2015), May. 9 -12, 2015, San Diego, USA. (invited for oral presentation, paper acceptance rate 6 %).*

10. **Huang, S.**, Li J., Ye, J., Chen, L., Wu, T., Fleisher, A. and Reiman, E., "Identifying Alzheimer's Disease-Related Brain Regions from Multi-Modality Neuroimaging Data using Sparse Composite Linear Discrimination Analysis," *Proceedings of Neural Information Processing Systems Conference (NIPS)*, Dec. 12-17, 2011, Granada, Spain. *(invited for oral presentation, paper acceptance rate 4.8%).*

11. **Huang, S.**, Li, J., Ye, J., Fleisher, A., Chen, K. and Wu, T., "Brain Effective Connectivity Modeling for Alzheimer's Disease by Sparse Bayesian Network," *The 17th ACM SIGKDD*

Conference on Knowledge Discovery and Data Mining (KDD 2011), Aug. 21-24, 2011, San Diego, USA. *(invited for poster presentation, paper acceptance rate 17.5%).*

12. **Huang, S**., Li, J., Sun, L., Ye, J., Chen, K. and Wu, T., "Learning Brain Connectivity of Alzheimer's Disease from Neuroimaging Data," *Proceedings of Neural Information Processing Systems Conference (NIPS)*, Dec. 7-9, 2009, Vancouver, B.C., Canada. *(invited for oral presentation, acceptance rate 8%).*

Abstract paper (peer-reviewed)

1. **Samareh, A**[1]., **Jin, Y**[1]., Wang, Z., Chang, X. and **Huang, S**., "Predicting Depression Severity by Multi-Modal Feature Engineering and Fusion", *The Thirty-Second AAAI Conference on Artificial Intelligence (AAAI 18)*, 2 pages.

Workshop paper (peer-reviewed)

1. Pakbin, A., **Samareh, A**[1]., Chen, X., Hurley, N., Yuan, Y., Qian, X., Wang, Z., **Huang, S**. and Mortazavi, B., "Uncertainty Quantification for Deep Context-Aware Mobile Activity Recognition and Unknown Context Discovery", *Workshop on Uncertainty and Robustness in Deep Learning in the Proc. of 2019 International Conference on Machine Learning (ICML)*, Long Beach, CA, Jun 2019.

2. Lu, M., **Huang, S**., Odegard, J., Speake, C., Huang, J.Z. and Qian, X. "EigenBiomarker: A Method for Composite Biomarker Detection with Applications in Type 1 Diabetes (T1D)", *Proc. 14th International Workshop on Data Mining in Bioinformatics (BIOKDD)*, Sydney, Australia, August 2015.

3. Lu, M., **Huang, S**., Odegard, J., Speake, C., Huang, J.Z. and Qian, X. "A Model for Scoring Candidate Biomarker Utility in High-Dimensional Datasets with Replicate Tests", *Proc. Workshops on Machine Learning in Computational Biology (MLCB) & Machine Learning in Systems Biology (MLSB) 2015, in conjunction with the Annual Conference on Neural Information Processing Systems (NIPS) 2015*, Montreal, Canada, December 2015.

Book

1. **Huang, S**. and Deng, H. *Data Analytics: A Small Data Approach*. Chapman and Hall/CRC, 1st Edition, 2021.

Journal issues edited

1. EURASIP Journal of Advances in Signal Processing, for the special issue: Biomedical Informatics with Optimization and Machine Learning, 2019
2. IIE Transactions on Healthcare Systems Engineering, for the special issue: Artificial Intelligence in Healthcare Informatics: Learning, Optimization, and Decision Making, 2018
3. EURASIP Journal of Advances in Signal Processing, for the special issue: Biomedical Informatics with Optimization and Machine Learning, 2017
4. EURASIP Journal of Advances in Signal Processing, for the special issue: Biomedical Informatics with Optimization and Machine Learning, 2016
5. Brain Informatics, for the special issue: Computational Methods for Neuroimaging Data Analytics, 2015

Abstracts, letters, non-refereed papers, technical reports

Editorial Note
1. **Huang, S**., Zhou, J., Wang, Z, Ling, Q. and Shen, Y. "Biomedical Informatics with Optimization and Machine Learning", *EURASIP Journal of Advances in Signal Processing*, Editorial Note for the Special Issue of Biomedical Informatics with Optimization and Machine Learning, 2017.

Tutorial
1. **Huang, S**. and W. Art Chaovalitwongse., "Computational Optimization and Statistical Methods for Big Data Analytics: Applications in Neuroimaging", *INFORMS Tutorial*, Vol. 5, 71-88, 2015.

Technical Report
1. **Feng, T.**, Vehik, K., Lynch, K., Hagopian, W., Galas, D., Sakhanenko, N., Das, S., Lernmark, A., Ziegler, A., Toppari, J., Rewers, M., She, J.X., Schatz, D., Akolkar, B., Krischer, J., Qian, X., **Huang, S**. and the TEDDY Study Group., "Discovery of Gene-Environmental Interaction Patterns toward Persistent Autoimmunity via a Rule-based Method in the Environmental Determinants of Diabetes in the Young (TEDDY) Study", TEDDY Study, 2016.

OTHER SCHOLARLY ACTIVITY

Invited lectures and seminars.
1. University of Arizona, Tucson, AZ, "New Analytics Models in the Era of Internet of Things (IoT): An Example about Crowdsourcing", Sep 26, 2019.
2. University of Michigan, Ann Arbor, MI, "Smartphones Medicalized, with Data Analytics for Complex Diseases Management", Sep 16, 2019.
3. North Carolina State University, Raleigh, NC, "Smart Monitoring for Complex Diseases via Collaborative Learning and Selective Sensing", Oct 16, 2018.
4. Xi'an Jiaotong University, Xi'an, China, "Detect Depression from Communication: How Computer Vision, Signal Processing, and Sentiment Analysis Join Forces", Sep 16, 2018.
5. Xi'an Jiaotong University, Xi'an, China, "System Workshop: An Industrial Engineering Perspective of Data Science", June 21, 2017.
6. Virginia Tech, Blacksburg, VA, "Smart Monitoring for Complex Diseases via Collaborative Learning and Selective Sensing", April 19, 2017.
7. Georgia Institute of Technology, Atlanta, GA, "Smart Monitoring for Complex Diseases via Collaborative Learning and Selective Sensing", Feb 23, 2017.
8. Juvenile Diabetes Research Foundation Biomarker Working Group, online seminar, "Interactions Discovery for Better Understanding of Type 1 Diabetes", Jan 21, 2017.
9. Texas A&M University, College Station, TX, "Optimal Expert Knowledge Elicitation for Bayesian Network Structure Identification", Oct 21 2016.
10. Chinese Academy of Science, Beijing, China. "Optimal Expert Knowledge Elicitation for Bayesian Network Structure Identification", June 7 2016.
11. Tsinghua University, Beijing, China, "Optimal Expert Knowledge Elicitation for Bayesian Network Structure Identification", June 2 2016.
12. Benaroya Research Institute, Seattle, WA, "Complex Biomarker Discovery from Big Omics Data for Alzheimer's Disease and Type 1 Diabetes", Feb 9 2016.
13. University of Washington Biomedical and Health Informatics (BHI), "Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing", Jan 29 2016.

14. Chinese Academy of Science, "Towards Mechanistic Understanding of Complex Healthcare Problems", Dec 18 2015.
15. University of Wisconsin at Madison, "Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing", Dec 4 2015.
16. Benaroya Research Institute, Seattle, WA, "EigenBiomarker: A Method for Composite Biomarker Detection with Applications in Type 1 Diabetes", Nov 19 2015.
17. Integrated Brain Imaging Center at University of Washington, Seattle, WA, "Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing", Nov 13 2015.
18. Juvenile Diabetes Research Foundation Biomarker Working Group, online seminar, "From Correlations to Mechanism to Systems", Sep 12, 2015.
19. Center of Process Analytics, Seattle, WA, "Diagnosis-Oriented Monitoring of High-Dimensional Manufacturing Processes", May 18, 2015.
20. Benaroya Research Institute, Seattle, WA, "Discover Complex Biomarkers via Machine Learning Models", December 16 2014.
21. Integrated Brain Imaging Center at University of Washington, Seattle, WA, "From Brain Connectivity to Smart Monitoring of Alzheimer's", Oct 22 2014.

Presentations given at conferences.
1. "Data Science for Healthcare Automation", IEEE CASE 2019 Workshop on Data Science for Engineering Automation, Vancouver, Canada, August 22, 2019.
2. "Data Science for Complex Disease Research and Management", IEEE CASE 2019 Workshop on Healthcare 4.0: Smart and Interconnected Healthcare Systems, Vancouver, Canada, August 22, 2019.
3. "Predictive Analysis of Type 1 Diabetes", Big Data in T1D Workshop by Juvenile Diabetes Research Foundation and Helmsley Trust, Reston, VA, Aug 15, 2018.
4. "Mental Health Monitoring using Dynamic Vocal Biomarkers", INFORMS Annual Conference, Houston, Oct 2017.
5. "Interaction Patterns between Fatty Acids and SNPs via Rule-based Analysis", TEDDY conference, Arlington, VA, Oct 2016.
6. "Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing", China R Conference, June 2016.
7. "CHI: A mHealth Application for Aging Monitoring, Intervention and Evaluation with Contemporaneous Health Index", ISERC, May, 2016.
8. "High-dimensional Process Monitoring using Embedding Distribution in RKHS", ISERC, May, 2016.
9. "Discovery of Progression Patterns towards Autoimmunity for Type 1 Diabetes: A Rule-based Method for TEDDY Data Analysis", TEDDY conference, Arlington, VA, April. 2016.
10. "Analysis of Electronic Health Record Based Depression Trajectory and Monitoring", INFORMS Annual Conference, Philadelphia, Nov. 2015.
11. "Diagnostic Monitoring of Multivariate Process via a LASSO-BN Formulation", INFORMS Annual Conference, Philadelphia, Nov. 2015.
12. "High-throughput Screening for Rule Discovery from High-dimensional Database", INFORMS Annual Conference, Philadelphia, Nov. 2015.
13. "Large-Scale Personalized Health Surveillance by Selective Sensing", INFORMS Annual Conference, Philadelphia, Nov. 2015.
14. "Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing", Nashville, ISERC, May 2015.
15. "Domain Knowledge-Driven Degradation Modeling of Alzheimer's Disease", SDM 2015, Vancouver, Canada, 2015.

16. "A Joint Spectral Decomposition Method for Time-Dependent Network Data", INFORMS Annual Conference, San Francisco, Nov. 2014.
17. 'Collaborative Degradation Modeling by Fusing Data on a Networked Structure", INFORMS Annual Conference, San Francisco, Nov. 2014.
18. "A Transfer Learning Approach for Network Modeling", ISERC, Montreal, May. 2014.
19. "High-dimensional Process Monitoring and Change Point Detection Using Embedding Distributions in Reproducing Kernel Hilbert Space (RKHS)", ISERC, Montreal, May. 2014.
20. Invited Session sponsored by IIE Transactions at INFORMS Annual Meeting in 2014, San Francisco, *High-dimensional Process Monitoring and Change Point Detection Using Embedding Distributions in Reproducing Kernel Hilbert Space (RKHS)*, November 12 2014.
21. Invited Session sponsored by IIE Transactions at INFORMS Annual Meeting in 2013, Minneapolis, *A Transfer Learning Approach for Network Modeling*, October 8 2013.
22. "High-dimensional Process Monitoring and Change Point Detection Using Embedding Distributions in Reproducing Kernel Hilbert Space (RKHS)", the 9th Annual IEEE Conference on Automation Science and Engineering (CASE 2013), Madison, Wisconsin, Aug. 2013.
23. "Multi-Modality Data Fusion using Sparse Composite Linear Discriminant Analysis," INFORMS Annual Conference, Phoenix, AZ, Oct. 2012.
24. "Regression-based Process Monitoring with Consideration of Measurement Errors", NSF CMMI Grantee Conference, Boston, 2012.
25. "Brain Effective Connectivity Modeling for Alzheimer's Disease by Sparse Gaussian Bayesian Network," INFORMS Annual Conference, Charlotte, NC, Nov. 2011.
26. "Hypergraph-based Gaussian Process Models with Both Qualitative and Quantitative Inputs," INFORMS Annual Conference, Charlotte, NC, Nov. 2011.
27. "Brain Effective Connectivity Modeling for Alzheimer's Disease by Sparse Gaussian Bayesian Network", KDD, San Diego, CA, Aug. 2011.
28. "A Graphical Technique for Identifying and Estimating Infant Failures", IERC, Reno, NV, May. 2011.
29. "Regression-based Process Monitoring with Consideration of Measurement Errors", IERC, Reno, NV, May. 2011.
30. "Sparse Bayesian Network for Brain Connectivity Modeling of Alzheimer's Disease", IERC, Reno, NV, May. 2011.
31. "Sparse Graphical Models with Applications in Alzheimer's Disease," SIAM International Conference on Data Mining, Phoenix, AZ, Apr. 2011.
32. "Linking Nursing Care Coordination with Patient Care Quality, " INFORMS Annual Conference, Austin, TX, Nov. 2010.
33. "Learning Brain Connectivity of Alzheimer's Disease by Exploratory Graphical Models, " INFORMS Annual Conference, San Diego, CA, Oct. 2009.
34. "Learning Brain Connectivity of Alzheimer's Disease by Exploratory Graphical Models," INFORMS Western Regional Conference, Tempe, AZ, Apr. 2009.

GRADUATE STUDENTS

Chaired Doctoral Degrees
At the University of Washington

1. Ying Lin (Graduated in 2017, co-advise with Dr. Shan Liu)
   o Dissertation topic: Large-Scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing

- o The Lee B. Lusted Student Prize from the Society for Medical Decision Making (SMDM) in 2016
- o Finalist of the Best Student Paper Competition of the QCRE Subdivision at ISERC, 2017
- o First position: Assistant Professor in the Department of Industrial Engineering at the University of Houston.

2. Cao Xiao (Graduated in 2016, co-advise with W. Art Chaovalitwongse)
   - o Dissertation topic: "Optimization and Machine Learning Methods for Medical and Healthcare Applications"
   - o Finalist of IIE-CIS Mobile App Competition in 2016 (Team lead of UW-CHI app)
   - o First position: Research Scientist at the Center of Computational Health at IBM T.J. Watson
   - o Current position: Director of Machine Learning at Analytics Center of Excellence, IQVIA

3. Yan Jin (Graduated in 2017)
   - o Dissertation topic: Diagnostic Monitoring of Complex High-dimensional Networked Systems
   - o Finalist of the Best Student Paper Competition of the QSR Division at INFORMS, 2015
   - o First position: Research Scientist at JD.com (San Francisco Lab)

4. Aven Samareh (Graduated in 2019)
   - o Dissertation topic: Contemporaneous Health Monitoring and Biomarker Discovery by Integration of Patient Data and Disease Knowledge
   - o Outstanding Female Engineer Award, University of Washington, 2019
   - o First position: Research Scientist at Convey

5. Xi Zhu (Graduated in June 2020, co-advised with Cynthia Chen)
   - o Dissertation topic: Individual Preference Learning with Collaborative Learning Framework

6. Jingshuo Feng (Graduated in May 2021)
   - o Dissertation topic: Modeling Heterogeneous User Behavior in Interactive Systems by Graphical Model and Collaborative Learning Framework

At the University of South Florida

7. Yazhuo Liu (graduated in 2015, co-advised with Dr. Jose Zayas-Castro)
   - o Dissertation: Patient Population, Clinical Associations, and System Efficiency in Healthcare Delivery System

8. Mona Haghighi (Graduated in 2016)
   - o Dissertation topic: High-throughput Rule Discovery from Complex Biomedical Data
   - o First position: Optimization Statistician at Citi

Current Doctoral Students
At department of Industrial and Systems Engineering at the University of Washington

9. Ameer Hamza Shakur (2019 – present)
   - o General exam passed on 04/2021
   - o Dissertation topic: "Learning Rule-based Decision Making Systems for Heterogeneous Longitudinal Survival Data"

10. Wengeng Pan (2019 – present)

    - o Qualify exam passed in 02/2021

11. Feng Lin (2020 – present)

Masters Students Supervision

- Yi He (UW ISE, 2014 – 2016), Junfan Tian (UW ISE, 2014 – 2016), Xiao Tan (UW ISE, 2015-2016), Xiaojin Zhu (2016-2017, UW Stat), Runsheng Liu (2018-2019, UW Stat)

Undergraduate Research Supervision

- Eric Kammers (2015-2017, UW ISE), Chuyang Ke (2015-2017, U of Rochester), Borui Li (2015-2016, UW CSE), Xu Fan (2018 – 2019, UW ISE), Tianyi Wang (2018 – 2019, UW ISE), Michael Chou (2019 - 2020)

Other significant student supervision

- PhD. Committee member for Xingwei Wu (ISE), Jue Gong (ISE), Kevin Liu (ISE), Ning Li (ISE), Tim Wu (Biomedical informatics and medical education), Ahmad Ajdari (Biomedical informatics and medical education), Pan Li (ECE)

- Visiting PhD students: Shaogang Ren (EECS@Texas A&M University) in Summer 2016; Randy Ardywibowo (EECS@Texas A&M University) in Summer 2018. Yi Yang (Xi'an Jiaotong University) from 2019 – 2021

RESEARCH ACTIVITIES

Funded Research (as PI, co-PI, or co-Investigator)

Total funding amount:$7M. My responsibility: $2.5M.

External Support

Funding Agency	*Title*	Your role with other PI's and co-PI's	Total Amount, Your Amount, (Subcontracts if any, University Matching if any)	Dates (start - finish)
NSF	Collaborative Research: A Whole-Community Effort to Understand Biases and Uncertainties in Using Emerging Big Data for Mobility Analysis	Co-PI PI: Cynthia Chen (UW CEE) In collaboration with Ryan Wang (PI at Northeastern University)	$542,476/ $258,371	09/2021-08/2024
NSF	Effective Risk-based Monitoring Strategies for Depression	Co-PI PI: Shan Liu (UW ISE)	$463,229/ $210,324	08/2018-07/2021
USDOT	Teaching Old Model New Tricks (TOMNET)	Co-PI PI: Cynthia Chen (UW Civil Engineering)	$178,580/ $6,017	08/2018-07/2019

DARPA	Context-Aware Biomarker Discovery and Health Monitoring by Adaptive Integration of Heterogeneous Smartphone Signals	PI at UW Subcontract from Texas A&M University (PI: Zhangyang Wang)	$1,956,729/ $671,620	04/2018 – 03/2022
NSF	AF: Small: Collaborative Research: Personalized Environmental Monitoring of Type 1 Diabetes: A Dynamic System Perspective	PI (under grant no. CCF-1715027). In collaboration with Xiaoning Qian (Texas A&M University) (under grant no. CCF-1718513) and Ji Liu (University of Rochester) (under grant no. CCF-1714136).	$158,300/ $158,300	08/2017 – 07/2020
AFOSR	Dynamic Data-Driven Modeling, Sampling and Monitoring of Big Spatial-Temporal Data Streams for Real-Time Solar Flare Detection	PI at UW Subcontract from UW-Madison (PI: Kaibo Liu)	$200,001/ $78,000	02/2018 – 02/2020
Juvenile Diabetes Research Foundation	A Systematic Dynamic Model to Understand Progression Heterogeneity of Type 1 Diabetes	PI. co-PI: Xiaoning Qian (Texas A&M University), Kendra Vehik (University of South Florida), Kristian Lynch (University of South Florida), Bill Hagopian (University of Washington). JDRF grants are competitive.	$328,225/ $173,683	10/2017 – 09/2019
DARPA	Automatic Composition of Complex Pipelines	PI at UW Subcontract from Texas A&M University (PI: Xia Hu)	$960,000/ $320,000	4/2017 – 4/2021 (last two years contingent

	via End-to-End Learning and User Interaction			on first two years)
NIH	Enhancement of Biomarkers for Type 1 Diabetes	Co-PI PI: Massimo Pietropaolo at Baylor College of Medicine	$1,200,000/ $46,230	7/2017-6/2022
NSF	Collaborative: Smart Monitoring for Alzheimer's Disease via Data Fusion, Personalized Prognostics and Selective Sensing	PI (under grant no. CMMI-1505260) co-PIs: Brent Small (USF), Bo Zeng (University of Pittsburgh), Kewei Chen (Banner Alzheimer's Institute). This project is in collaboration with Kaibo Liu (UW-Madison) (under grant no. CMMI-1435809). This grant had a REU supplement for a budget $8,000 (09/16-08/17).	$232,270/ $183,256	9/2014 - 9/2017
Juvenile Diabetes Research Foundation	A Rule-Based Prognostic Model for Type I Diabetes by Characterizing and Synthesizing Rules from Longitudinal Data	PI (co-PIs: Jeffrey Krischer, Ping Xu, Kendra Vehik, USF; Xiaoning Qian, TAMU)	$110,000/ 70,000	9/2014 - 9/2015
NSF	Collaborative Research: Collaborative Degradation Analysis for Enterprise-Level Maintenance Management via Dynamic Segmentation	PI (under grant no. CMMI-1536398) This project is in collaboration with Eunshin Byon (University of Michigan) (under grant no. CMMI-1536924).	$194,862/ $194,862	07/15 – 07/18

		This grant has a REU supplement for a budget $8,000		
Helmsley Foundation for Diabetes Research	Integrated Information Theory and Rule-based Methods for High-Throughput Pattern Discovery in TEDDY Study Data Analysis	Co-PI (PI: David Galas from PNDRI)	$400,000/ $100,000	07/15 - 07/17
US. Army Electronic Proving Ground	Big Data in Large Communication Networks – Mining and Visualization	Co-PI (PI: Jing Li, Arizona State University)	$280,000/ $30,000	8/2012 - 10/2013

Internal Support

Funding Agency	*Title*	Your role with other PI's and co-PI's	Total Amount, Your Amount, (Subcontracts if any, University Matching if any)	Dates (start - finish)
Royalty Research Fund at UW	Development and Analysis of EHR-based Depression Screening and Monitoring	Co-PI. PI: Shan Liu (UW ISE)	$40,000/ $20,000	06/2015 - 05/2016
Byrd Alzheimer's Institute at USF	Integrative Analysis and Identification of Biomarkers of Alzheimer's Disease and Parkinson Disease	PI	$18,227/ $18,227	05/2014 - 08/2014
Byrd Alzheimer's Institute at USF	A Cost-Effective Enrichment Methodology of Amyloid Positive Cognitively Normal Cases by Integrating Neuropsychological Tests with Blood-based Biomarkers	PI	$15,791/ $15,791	05/2013 - 08/2013
Pediatrics Epidemiology Center at USF	Risk Modeling of Type 1 Diabetes by Mining the Big Clinical Trial Data: DPT-1, TrialNet and TEDDY	PI	$24,782/ $24,782	05/2013 - 08/2013

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TEACHING

Courses Taught

At the University of Washington
IND 521 Quality Control in Manufacturing, 2015
IND 524 Robust Design and Quality Engineering, 2015-2020
IND 321 Statistical Quality Control, 2015-2020
IND 316 Probability and Statistics for Engineers, 2015-2016
IND 427 Data Analytics for Systems Engineering, 2017-2021

At the University of South Florida
ESI 4221 Industrial Stat/Quality Control, 2013-2014
ESI 6934 Advanced Analytics II, 2013

SERVICE

Departmental service

- Faculty advisor for Alpha Pi Mu UW Chapter, 2018, 2019
- Graduate Committee 2016, 2017, 2019
- ISE Faculty Search Committee 2015, 2016
- Undergraduate Committee 2015, 2016, 2018, 2019
- Faculty senate, 2021

Professional society and other service

Editorial Board

- Associate Editor: INFORMS Journal of Data Science, 2020 - present
- Associate Editor: IIE Transactions on Healthcare Systems Engineering, 2016 – present
- Associate Editor: Quality Technology and Quantitative Management, 2016 – 2020
- Guest Editor: IIE Transactions on Healthcare Systems Engineering, for the special issue: Artificial Intelligence in Healthcare Informatics: Learning, Optimization, and Decision Making, 2018
- Guest Editor: EURASIP Journal of Advances in Signal Processing, for the special issue: Biomedical Informatics with Optimization and Machine Learning, 2016, 2017
- Guest Editor: Brain Informatics, for the special issue: Computational Methods for Neuroimaging Data Analytics, 2015
- Associate Editor: Journal of Alzheimer's Disease, 2014-2015

Ad-hoc Journal Reviews

Journal of Machine Learning Research, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Biomedical Engineering, NeurIPS, ICML, KDD, SDM, ICDM, AAAI, Neuroimage, Technometrics, IIE Transactions, PLOS one, Pattern Recognition, Computational Statistics and Data Analysis, Artificial Intelligence in Medicine, Journal of Biomedical Informatics

Grant review

- NSF SCH, OE
- Juvenile Diabetes Research Foundation (JDRF)
- Royalty Research Fund (RRF), UW
- Israeli Ministry of Science and Technology

Society Activities

- Elected as Board Member in Quality Control and Reliability Engineering Division of IIE, 2015-2017
- Chair, Best Student Paper Competition in the Quality Control and Reliability Engineering (QCRE) Division of ISERC Annual Conference, 2015, 2016
- Newsletter Editor for Quality, Statistics and Reliability Subdivision of INFORMS, 2014 – 2016
- Elected as Council Member in Data Mining Subdivision of INFORMS, 2013-2015
- Judge for Best Student Paper Competition in Data Mining Subdivision of INFORMS Annual Conference 2013- 2019, Best Student Paper Competition in the Quality Control and Reliability Engineering (QCRE) Division of ISERC Annual Conference 2014-2019, Best (Student) Paper Competition in Quality, Statistics, and Reliability (QSR) Subdivision of INFORMS Annual Conference 2015-present

Conference Organizing Activities

- Co-Chair, the International Workshop on Biomedical Informatics with Optimization and Machine Learning, in conjunction with International Joint Conference on Artificial Intelligence (IJCAI) 2016-2020
- Co-Chair, the 3rd International Workshop on Data Mining and Visualization for Brain Science in conjunction with ACM conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB'16)
- Co-Chair, the Data Mining (DM) Workshop at INFORMS 2015
- Chair, the BigBrain Minisymposium at the SIAM International Conference on Data Mining (SDM 2015)
- Cluster Chair for Data Mining Cluster at INFORMS Health Care 2015
- Program Committee member for IEEE BigData 2021, IEEE/ACM Conference on Connected Health Applications, Systems, and Engineering Technologies 2021
- Session Chair for sessions in Quality, Statistics and Reliability and Data Mining subdivisions at INFORMS Annual Conference, 2011-2019