

Kayhan Batmanghelich

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Research Interests	Methodology: Medical Vision, Explainable AI for Health care, Probabilistic Graphical Models, Bayesian Data Analysis, Machine Learning under Data Constraints, Multi-Modal Learning. Applications: Joint modeling of medical images and clinical health records (<i>e.g.</i> , genetic and free text) for lung diseases (<i>e.g.</i> , COPD) and Neurodegenerative diseases (<i>e.g.</i> , Alzheimer’s Disease).	
Academic Appointments	University of Pittsburgh , Pittsburgh, Pennsylvania Assistant Professor, Department of Biomedical Informatics Secondary, Department of Computer Science Secondary, Department of Electrical Engineering Adjunct, Machine Learning Department, Carnegie Mellon University Areas of Research: Machine Learning for Healthcare, Medical Vision, Imaging Genetics, Radiomics	9/2016 – present
	Harvard Medical School , Boston, Massachusetts R25 Research Fellow, Brigham and Women’s Hospital, Department of Radiology Supervisor: Prof. Sandy Wells	9/2015 – 9/2016
Education	Massachusetts Institute of Technology , Cambridge, Massachusetts Postdoctoral Associate, Computer Science and Artificial Intelligence Lab Advisor: Prof. Polina Golland Areas of Research: Multimodal Medical Vision, Machine Learning	6/2012 – 9/2015
	University of Pennsylvania , Philadelphia, Pennsylvania PhD in Electrical and Systems Engineering Advisors: Prof. Christos Davatzikos and Prof. Ben Taskar Thesis: Generative-Discriminative Basis Learning for Medical Imaging Applications	9/2007 – 5/2012
	University of Tehran , Tehran, Iran MSc in Electrical and Computer Engineering Advisor: Prof. Hamid Soltanian-Zadeh Thesis: Atlas-based Segmentation of Brain Structures Using Deformable Models	9/2002 – 9/2005
	Amirkabir University of Technology , Tehran, Iran BSc in Biomedical Engineering Advisor: Prof. Ali Motie Nasrabadi Thesis: Application of Fractal Dimension in Detection of Heart Arrhythmia from Cardiophone	9/1998 – 9/2002
Grants and Awards	NIH R01 HL141813-01 (PI): An Integrative Radiogenomic Approach to Design Genetically-Informed Image Biomarker for Characterizing COPD (\$2.8M) 2018-2023 NSF 1839332 TRIPODS+X (Multi-PI): Collaborative Research: Learning with Expert-In-The-Loop for Multimodal Weakly Labeled Data and an Application to Massive Scale Medical	

Imaging (\$600K) 2018-2021
PA Cure (Co-I): Functional interpretation of Alzheimer’s loci across cell types, age & DNA damage (\$495K) 2020-2023
SAP (PI): Deep Multi-Domain Learning: A Framework to Incorporate Weak Labels to the Attention Models (\$390K) 2018-2021
UPMC Enterprises (Co-PI): Commercialization of Realtime Evaluation for Adverse Events using Intraoperative Neurophysiological - READE IONM (\$300K) 2019-2020
Competitive Medical Research Fund (PI): Machine Learning Approach to Characterize COPD using Heritable Image Phenotype (\$40K) 2017-2018
Pfizer (PI): Developing Statistical Method to Jointly Model Genotype and High Dimensional Phenotype (\$100K) 2016-2017
NVIDIA Best Paper, Machine Learning in Medical Imaging Workshop in MICCAI 2017
NIH R25 Fellowship, Computer Assisted Interventions for Cancer Treatment, Brigham Women Hospital 2015
Second Place, MICCAI Challenge on Computer-Aided Diagnosis of Dementia based on Structural MRI Data 2014
M+Vision Grant Fellowship, The Madrid-MIT M+Vision Consortium 2013
Travel Award, 3rd Short Course on Statistical Genetics and Genomics 2013
Top 10 Cited article in NeuroImage in 2008 2008
Top 10 Student Papers, International Symposium on Biomedical Imaging 2011
Student Travel Award, 14th MICCAI conference 2011
Travel Grant, Mathematical Problems, Models and Methods in Biomedical Imaging, Institute for Pure and Applied Mathematics (IPAM) 2010
Ranked 90/~8,000, Nation-wide university entrance exam rank for MSc 2002
Ranked 313/~300,000, Nation-wide university entrance exam rank for BSc 1998

**Invited Talks/
Presentations**

May 2021: “Bridging Medical Insight and ML: Model Explanation, Learning, and Inference,” Senior Vice Chancellor Talk, University of Pittsburgh, US.
March 2021: “Bridging Medical Insight and ML: Model Explanation, Learning, and Inference,” Computer Science, University of Minnesota, US.
February 2021: “Bridging Medical Insight and ML: Model Explanation, Learning, and Inference,” Electrical and Computer Engineering, University of British Columbia, Canada.
April 2020: “Opportunities for AI in Healthcare: Predicting, Phenotyping, and Explaining,” Imperial College London, UK.
March 2020: “Opportunities for AI in Healthcare: Predicting, Phenotyping, and Explaining,” Computer Science, University of Toronto, Canada.
February 2020: “Opportunities for AI in Healthcare: Predicting, Phenotyping, and Explaining,” Computer Science, University of Washington, US.
January 2020: “Real-World Applications of Explainable Models in Medical Imaging,” DeepMind/Google Healthcare, UK.
December 2019: “Unpaired Data Empowers Association Tests,” 12th International Conference of the ERCIM WG, Computational and Methodological Statistics, UK.
Nov 2019: “AI-Healthcare Bridge: A Balance Between Prediction and Interpretation,” Radiology, University of Washington St. Louis, US.
October 2019: “Multi-Players in GANs: Effects and Applications,” 3rd Machine Learning Research Retreat, SAP, Germany.
March 2019: “AI-Healthcare Bridge: A Balance Between Prediction and Interpretation,” Computational Medicine, UCLA, US.
March 2019: “AI-Healthcare Bridge: A Balance Between Prediction and Interpretation,” Biomedical Engineering, CMU, US.
March 2019: “AI-Healthcare Bridge: A Balance Between Prediction and Interpretation,” Biomedical Engineering, Columbia University, US.
February 2018: “Imaging as High dimensional Endophenotype,” Computational Genomics Winter Institute, UCLA, US.
October 2017: “Generative Method to Discover Genetically Driven Image Biomarkers,” Computational Biology Department, CMU, US.

August 2016: “Diversifying Sparsity Using Variational Determinantal Point Processes,” Joint Statistical Meetings, Chicago, US.

June 2016: “Generative Method to Discover Genetically Driven Image Biomarkers,” International Society for Bayesian Analysis, Sardinia, Italy.

July 2015: “Understanding Medical Images Through the Lens of Genetics: a Statistical Modeling Approach,” Imperial College of London, London, UK.

July 2015: “Generative Method to Discover Genetically Driven Image Biomarkers,” International Conference on Information Processing in Medical Imaging (IPMI) Conference, Isle of Skye, Scotland (oral acceptance rate: 10%).

June 2015: “Understanding Medical Images Through the Lens of Genetics: a Statistical Modeling Approach,” Institute for Advanced Application at Geisinger Health System, Danville, US.

May 2015: “Understanding Medical Images Through the Lens of Genetics: a Statistical Modeling Approach,” Statistics in Imaging Section of the American Statistical Association meeting, University of Michigan, Ann Arbor, US.

March 2015: “Understanding Medical Images Through the Lens of Genetics: a Statistical Modeling Approach,” Tufts University, Boston, US.

February 2015: “Imaging Meets the Genetic World: A Joint Modeling Approach,” Applied Statistics Workshop at Harvard University, Cambridge, US.

November 2014: “Imaging Meets the Genetic World: A Joint Modeling Approach,” Computer Science Department colloquium talk, University of Massachusetts, Lowell, US.

June 2013: “Joint Generative Modeling of Imaging and Genetics,” International Conference on Information Processing in Medical Imaging (IPMI) Conference, Asilomar, US (oral acceptance rate: 13%).

July 2013: “Application of Machine Learning in Medical Imaging,” a short course for *M+Vision Fellows*, Madrid, Spain.

April 2010: “Disease Classification and Prediction via Semi-supervised Dimensionality Reduction,” IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI) Conference, Chicago, US.

April 2010: “Application of Regularized Low-Rank Decomposition for Feature Construction in Computational Anatomy,” Massachusetts Institute of Technology, Cambridge, US.

July 2009: “A General and Unifying Framework for Feature Construction, in Image-Based Pattern Classification,” International Conference on Information Processing in Medical Imaging (IPMI) Conference, Williamsburg, US (oral acceptance rate: 17%).

Teaching	UPitt BIOINF 2023 (Instructor): Biomedical Informatics Journal Club	Fall 2021
	UPitt BIOINF 2023 (Instructor): Biomedical Informatics Journal Club	Fall 2020
	UPitt BIOINF 2023 (Instructor): Biomedical Informatics Journal Club	Fall 2019
	CMU 10-708 (Instructor): Probabilistic Graphical Models	Spring 2018
	UPenn ESE 605 (Teaching Assistant): Modern Convex Optimization	Spring 2011
	UPenn ESE 605 (Teaching Assistant): Modern Convex Optimization	Spring 2009
	UPenn ESE 504 (Teaching Assistant): Introduction to Optimization Theory	Fall 2008

Mentoring Activities	Post-doctoral Fellows	
	• Junxiang Chen	2018 – present
	• Brian Pollack	2018 – 2021
	• Mingming Gong (Lecturer in Statistics Department, University of Melbourne)	2016 – 2019
	• Payman Yadollahpour (Research Fellow at Broad Institute)	2018 – 2019
	PhD Students (as Primary Advisor)	
	• Sumedha Singla (Computer Science)	2016 – present
	• Ke Yu (Intelligence System Program)	2018 – present
	• Yanwu Xu (Intelligence System Program)	2019 – present
	• Li Sun (Intelligence System Program)	2019 – present
	• Nihal Murali (Intelligence System Program)	2021 – present
	• Shantanu Ghosh (Intelligence System Program)	2021 – present
	• Matthew T. Ragoza (Intelligence System Program)	2021 – present
	Master Students	
	• Rohit Jena (CMU-Robotics)	2020 – present
	• Yingci Liu (DBMI)	2020 – present
	• Jiaming Bai (CMU-LTI)	2018 – 2019

- Keyi Yu (CMU-LTI) 2018 – 2019
 - Fan Qian (CMU-LTI) 2018 – 2019
 - Lisa Hou (CMU-LTI) 2018 – 2019
- Undergraduate Students**
- Sead Niksic (Electrical Engineering) 2020 – present

Academic Service

Organizing

- Machine Learning in Medicine, Biweekly Seminars in Pittsburgh (MLxMed) 2020 – present
- MICCAI Tutorial on Causality in Medical Image Computing (CauseMic) 2020
- MICCAI Workshop on Imaging Genetics (MicGen) 2014,2015

Editorial Board/Area Chair

- Journal of Machine Learning (JMLR) 2020 – present
- International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2018-2019

Adhoc Review Panel

- Reviewer for University of Washington (UW) Alzheimer’s Disease Research Center (ADRC) Development Project 2020
- Mentor in NIH Innovation Lab “Advancing Cancer Biology at the Frontiers of Machine Learning and Mechanistic Modeling” 2020

Journal Review

- Nature Research
- Nature Machine Intelligence
- Bayesian Analysis
- Journal of Machine Learning (JMLR)
- IEEE Transactions on Medical Imaging (TMI)
- Medical Image Analysis (MedIA)
- IEEE Transactions on Pattern Analysis & Machine Intelligence
- IEEE Transactions on Biomedical Engineering
- PLOS Computational Biology
- NeuroImage

Conference Review

- Conference on Neural Information Processing Systems (NIPS)
- Uncertainty in Artificial Intelligence (UAI)
- International Conference on Machine Learning (ICML)
- International Conference on Learning Representations (ICLR)
- Association for the Advancement of Artificial Intelligence (AAAI)

Publications

1. S. Singla, S. Wallace, S. Triantafillou, **K. Batmanghelich**, Using Causal Analysis for Conceptual Deep Learning Explanation, *To appear in International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2021.
2. R. Jena, S. Singla, **K. Batmanghelich**, Self-Supervised Vessel Enhancement Using Flow-Based Consistencies, *To appear in International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2021.
3. S. Singla, P. Yadollahpour, S. Singla, B. Pollack, W. Wells, F. Scierba, **K. Batmanghelich**, Incorporating External Information in Tissue Subtyping: a Topic Modeling, *To appear Machine Learning for Healthcare (MLHC)*, 2021.
4. S. Singla, M. Gong, C. Riley, F. Scierba, **K. Batmanghelich**, Improving Clinical Disease Subtyping and Future Events Prediction through a Chest CT based Deep Learning Approach, *Medical Physics*, pp 1168-1181, 2021.
5. L. Sun, K. Yu, **K. Batmanghelich**, Context Matters: Graph-based Self-supervised Representation Learning for Medical Images, *Thirty-Fifth Conference on Artificial Intelligence (AAAI)*, 2021.
6. K. Yu, S. Visweswaran, **K. Batmanghelich**, Semi-Supervised Hierarchical Drug Embedding in Hyperbolic Space, *Journal of Chemical Information and Modeling*, pp 5647-5657, 2020.

7. M. Gong, P. Liu, S. Frank, P. Stojanov, D. Tao, G. Tseng, K. Zhang, **K. Batmanghelich**, Unpaired Data Empowers Association Tests, *Bioinformatics*, pp 785–792m, 2020.
8. X. Yu, T. Lui, M. Gong, K. Zhang, **K. Batmanghelich**, D. Tao, Label-Noise Robust Domain Adaptation. *International Conference in Machine Learning (ICML)*, 2020.
9. M. Ravanbakhsh, V. Tschernezki, F. Last, T. Klein, **K. Batmanghelich**, Human-Machine Collaboration for Medical Image Segmentation. *IEEE International Conference on Acoustics, Speech and Signal Processing*, pp 1040-1044, 2020.
10. Y. Xu[†], M. Gong[†], J. Chen, **K. Batmanghelich**, Xu, Yanwu, Mingming Gong, Junxiang Chen, Ziyue Chen, and Kayhan Batmanghelich, 3D-BoxSup: Positive-Unlabeled Learning of Brain Tumor Segmentation Networks From 3D Bounding Boxes. *Frontiers in Neuroscience*, pp 350, 2020.
11. S. Singla, B. Pollack, J. Chen, **K. Batmanghelich**, Explanation by Progressive Exaggeration. *Eighth International Conference on Learning Representations (ICLR)*, 2020.
12. J. Chen, **K. Batmanghelich**, Weakly Supervised Disentanglement by Pairwise Similarities. *Thirty-Fourth Conference on Artificial Intelligence (AAAI)*, 2020.
13. Y. Xu*, M. Gong*, J. Chen, T. Liu, K. Zhang, **K. Batmanghelich**, Generative-Discriminative Complementary Learning. *Thirty-Fourth Conference on Artificial Intelligence (AAAI)*, 2020.
14. Y. Xu[†], M. Gong[†], C. Li, K. Zhang, **K. Batmanghelich**, Twin Auxiliary Classifiers GAN. *Conference on Neural Information Processing Systems (NeurIPS)*, 2019.
15. H. Fu, M. Gong, C. Wang, **K. Batmanghelich**, K. Zhang, D. Tao, Geometry-Consistent Adversarial Networks for One-Sided Unsupervised Domain Mapping. *Conference on Computer Vision and Pattern Recognition (CVPR)*, pp 2427-2436, 2019.
16. S. M.H. Huisman, A. Mahfouz, **K. Batmanghelich**, B. P.F. Lelieveldt, M. J.T. Reinders, A Structural Equation Model for Imaging Genetics Using Spatial Transcriptomics. *Brain Informatics*, pp 2-13, 2018.
17. Y. Xu, M. Gong, T. Liu, **K. Batmanghelich**, C. Wang, Robust Angular Local Descriptor Learning. *Asian Conference on Computer Vision*, pp 420-435, 2018.
18. S. Singla, M. Gong, S. Ravanbakhsh, F. Sciurba, B. Poczoz, **K. Batmanghelich**, Subject2Vec: Generative-Discriminative approach from a Set of Image Patches to a Vector. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp 502-510, 2018.
19. H. Fu, M. Gong, Ch. Wang, **K. Batmanghelich**, D. Tao, Deep Ordinal Regression Network for Monocular Depth Estimation. *Conference on Computer Vision and Pattern Recognition (CVPR)*, pp 2002 - 2011, 2018.
20. X. Yu, T. Liu, M. Gong, Ch. Wang, **K. Batmanghelich**, D. Tao, An Efficient and Provable Approach for Mixture Proportion Estimation Using Linear Independence Assumption. *Conference on Computer Vision and Pattern Recognition (CVPR)*, pp 4480-4489, 2018.
21. J. Schabdach, S. Wells, M. Cho, **N. Batmanghelich**, A Likelihood-Free Approach for Characterizing Heterogeneous Diseases in Large-Scale Studies. *International Conference on Information Processing in Medical Imaging (IPMI)*, LNCS, pp 170-183, 2017.
22. O. Freifeld, S. Hauberg, J. Fisher III, **N. Batmanghelich**, Transformations Based on Continuous Piecewise-Affine Velocity Fields. *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 39 (12), pp 2496-2509, 2017.
23. **N. Batmanghelich**, A. Saeedi, R. J. Estepar, M. Cho, S. Wells, Inferring Disease Status by non-Parametric Probabilistic Embedding. *Workshop on Medical Computer Vision: Algorithms for Big Data (MCV), Held in Conjunction with International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS, pp 49-57, 2016.
24. P. Binder **N. Batmanghelich**, R. J. Estepar, P. Golland, Unsupervised Discovery of Emphysema Subtypes in a Large Clinical Cohort. *7th International Workshop on Machine Learning in Medical Imaging (MLMI), Held in Conjunction with International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS, pp 180-187, 2016.
25. **N. Batmanghelich**[†], A. Saeedi[†], K. Narasimhan, S. Gershman, Nonparametric Spherical Topic Modeling with Word Embeddings. *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (ACL)*, pp 537-542, 2016.

26. **N. Batmanghelich**, A. Dalca, G. Quon, M. Sabuncu, P. Golland, Probabilistic Modeling of Imaging, Genetics and the Diagnosis. *IEEE Transactions on Medical Imaging (TMI)*, pp 1765-1779, 2016.
27. O. Freifeld, S. Hauberg, **N. Batmanghelich**, J. Fisher III, Highly-Expressive Spaces of Well-Behaved Transformations: Keeping It Simple. *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, pp 2911-2919, 2015.
28. **N. Batmanghelich**[†], A. Saeedi[†], M. Cho, R. J. Estepar, P. Golland, Generative Method to Discover Genetically Driven Image Biomarkers. *International Conference on Information Processing in Medical Imaging (IPMI)*, LNCS 9123, pp 30-42, 2015.
29. **N. Batmanghelich**, M. Cho, R. Estepar, P. Golland, Spherical Topic Models for Imaging Phenotype Discovery in Genetic Studies. *Workshop on Bayesian and Graphical Models for Biomedical imaging, International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, LNCS 8677, pp 107-117, 2014.
30. C. Wachinger, **N. Batmanghelich**, P. Golland, M. Reuter, BrainPrint in the Computer-Aided Diagnosis of Alzheimer's Disease. *Challenge on Computer-Aided Diagnosis of Dementia. International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2014.
31. **N. Batmanghelich**, A. Dalca, M. Sabuncu, P. Golland, Joint Modeling of Imaging and Genetics. *International Conference on Information Processing in Medical Imaging (IPMI)*, LNCS 7917, pp 766-777, 2013.
32. Y. Ghanbari, L. Bloy, **N. Batmanghelich**, R. Verma, Dominant Component Analysis of Electrophysiological Connectivity Network. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp 231-238, 2012.
33. **N. Batmanghelich**, B. Taskar, C. Davatzikos, Generative-Discriminative Basis Learning for Medical Imaging. *IEEE Transactions on Medical Imaging (TMI)*, 31(1), pp 51-69, 2012.
34. L. Bloy, M. Ingallhalikar, **N. Batmanghelich**, An integrated Framework for High Angular Resolution Diffusion Imaging-Based Investigation of Structural Connectivity. *Brain Connectivity*, 2(2), pp 69-19, 2012.
35. **N. Batmanghelich**, B. Taskar, C. Davatzikos, Regularized Tensor Factorization for Multi-Modality Medical Image Classification. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, pp 17-24, 2011.
36. **N. Batmanghelich**, D. Ye, B. Taskar, C. Davatzikos, Disease Classification and Prediction via semi-supervised Dimensionality Reduction. *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, pp 1086-1090, 2011.
37. **N. Batmanghelich**, A. Gooya, B. Taskar, C. Davatzikos, Application of Trace-Norm and Low-Rank Matrix Decomposition for Computational Anatomy. *IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA), Computer Vision and Pattern Recognition Workshops (CVPRW)*, pp 146-153, 2010.
38. C. Davatzikos, P. Bhatt, L. Shaw, **N. Batmanghelich**, J. Trojanowski, Prediction of MCI Conversion via MRI, CSF Biomarkers, and Pattern Classification. *Neurobiology of Aging*, 32(12), pp 2322.e19-2322.e27, 2010.
39. **N. Batmanghelich**, B. Taskar, C. Davatzikos, A General and Unifying Framework for Feature Construction, in Image-Based Pattern Classification. *International Conference on Information Processing in Medical Imaging (IPMI)*, LNCS 5636, pp 423-434, 2009.
40. Y. Fan, **N. Batmanghelich**, C. Clark, C. Davatzikos, Spatial Patterns of Brain Atrophy in MCI Patients, Identified via High-dimensional Pattern Classification, Predict Subsequent Cognitive Decline. *NeuroImage*, 39(4), pp 1731-43, 2008.
41. **N. Batmanghelich**, R. Verma, On Non-linear Characterization of Tissue Abnormality by Constructing Disease Manifolds. *IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA), Computer Vision and Pattern Recognition Workshops (CVPRW)*, pp 1-8, 2008.
42. H. Shariatpanahi, **N. Batmanghelich**, A. Kermani, M. Ahmadabadi, H. Soltanian-Zadeh, Distributed Behavior-based Multi-agent System for Automatic Segmentation of Brain MR Images. *International Joint Conference on Neural Networks (IJCNN)*, pp 4535-4542, 2006.

43. **N. Batmanghelich**, H. Soltanian-Zadeh, B. Aarabi, Knowledge-based Segmentation: Using Simultaneous Shape Prior and Histogram Information to Segment Brain Structures. *IASTED Conference on Signal and Image Processing*, pp 15-17, 2005.
44. M. Karimi, **N. Batmanghelich**, H. Soltanian-Zadeh, C. Lucas, A 3-D Deformable Surface Method for Automatic Hippocampus-Amygdala Complex Segmentation. *IEEE Nuclear Science Symposium Conference Record*, 6, pp 3725-3729, 2004.

Reports/ Preprints

1. L. Sun, J. Chen, Y. Xu, M. Gong, K. Yu, **K. Batmanghelich**, Hierarchical Amortized Training for Memory-efficient High Resolution 3D GAN, *arXiv:2008.01910*, 2020.
2. J. Chen, **K. Batmanghelich**, Robust Ordinal VAE: Employing Noisy Pairwise Comparisons for Disentanglement. *arXiv:1910.05898*, 2019.
3. H. Salman, P. Yadollahpour, T. Fletcher, **K. Batmanghelich**, Deep Diffeomorphic Normalizing Flows. *arXiv preprint arXiv:1810.03256*, 2018.
4. M. Gong, K. Zhang, B. Huang, C. Glymour, D. Tao, **K. Batmanghelich**, Causal Generative Domain Adaptation Networks. *arXiv preprint arXiv:1804.04333*, 2018.
5. K. Zhang, M. Gong, J. Ramsey, **K. Batmanghelich**, P. Spirtes, C. Glymour, Causal Discovery in the Presence of Measurement Error: Identifiability Conditions. *arXiv preprint arXiv:1706.03768*, 2017.
6. **N. Batmanghelich**, G. Quon, A. Kulesza, M. Kellis, P. Golland, L. Bornn, Diversifying Sparsity Using Variational Determinantal Point Processes. *arXiv preprint arXiv:1411.6307*, 2014.