

# Arshdeep Sekhon

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## Research Interests

- Broadly, I am interested in topics concerning intrinsic interpretability of deep learning models and deriving actionable structure from data.  
My research is centered around combining deep learning and interpretable graph structured representations, structure learning from heterogeneous high dimensional datasets and deep learning for biomedical applications.

## Education

- Ph.D. Candidate,**  
University of Virginia, Charlottesville, VA 2016-Now
- *Advisor: Dr. Yanjun Qi*
- Masters of Computer Science (MCS)**  
University of Virginia, Charlottesville, VA 2016-2021
- B.Tech.,**  
Dr. B. R. Ambedkar National Institute of Technology 2012-2016  
Jalandhar, India

## Experience

- Cruise AI** June 2021 - Now  
PhD Intern, Applied Research Scientist, Machine Learning

## Publications

1. **Arshdeep Sekhon**, Zhe Wang, Yanjun Qi. “*Relate and Predict: Structure-Aware Prediction with Jointly Optimized Neural Dependency Graph*” ICML 2020 Workshop on Graph Representation Learning and Beyond
2. **Arshdeep Sekhon**, Beilun Wang, Zhe Wang, Yanjun Qi. “*Differential Network Learning Beyond Data Samples*”, Preprint arXiv:2004.11494
3. Jack Lanchantin, **Arshdeep Sekhon**, Clint Miller, Yanjun Qi. “*Transfer Learning with Motif Transformers for Predicting Protein-Protein Interactions Between a Novel Virus and Humans*”, NeurIPS Covid-19 Symposium 2020, Learning Meaningful Representations of Life (LMRL) NeurIPS Workshop 2020, Machine Learning in Computational Biology (MLCB) 2020
4. **Arshdeep Sekhon**, Ritambhara Singh, Yanjun Qi. “*DeepDiff: Deep-learning for predicting Differential gene expression from histone modifications*”, Bioinformatics, Volume 34, Issue 17, 1 September 2018, Pages i891-i900 (Impact Factor: 5.481)
5. Beilun Wang, **Arshdeep Sekhon**, Yanjun Qi. “*Fast and Scalable Learning of Sparse Changes in High-Dimensional Gaussian Graphical Model Structure*”, Proceedings of the 21st International Conference on Artificial Intelligence and Statistics AISTATS 2018
6. Jack Lanchantin, **Arshdeep Sekhon**, Clint Miller, Yanjun Qi. “*Transfer Learning with Motif Transformers for Predicting Protein-Protein Interactions Between a Novel Virus and Humans.*”, Machine Learning in Computational Biology (MLCB) 2020
7. Beilun Wang, **Arshdeep Sekhon**, Yanjun Qi. *A Fast and Scalable Joint Estimator for Integrating Additional Knowledge in Learning Multiple Related Sparse*

*Gaussian Graphical Models*, (Proceedings of The 35th International Conference on Machine Learning (ICML 2018))

8. Ritambhara Singh, Jack Lanchantin, **Arshdeep Sekhon**, Yanjun Qi. “*Attend and Predict: Understanding Gene Regulation by Selective Attention on Chromatin*”, 31st Conference on Neural Information Processing Systems(NIPS 2017)
9. Ritambhara Singh, **Arshdeep Sekhon**, Kamran Kowsari, Jack Lanchantin, Beilun Wang, Yanjun Qi. “*GaKCo: a Fast GApped k-mer string Kernel using COunting*”, The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD 2017)
10. Jack Lanchantin, **Arshdeep Sekhon**, Ritambhara Singh, Yanjun Qi. “*Prototype Matching Networks for Large-Scale Multi-label Genomic Sequence Classification*”, preprint arXiv:1710.11238

**Presentations**      Relate and Predict: Structure-Aware Prediction with Jointly Optimized Neural Dependency Graph  
*Poster Presentation at ICML Workshop GRL+*      2020  
DeepDiff: Deep-learning for predicting Differential gene expression from histone modifications  
*Oral Presentation at European Conference on Computational Biology (ECCB)*      2018

**Grants and Awards**      Sture G. Olsson Fellowship in Engineering      2020  
UVA Presidential Fellow in Data Science      2018-2019  
European Conference on Computational Biology (ECCB) Travel Award      2018  
Women In Machine Learning (WiML) Workshop Travel Award      2017

**Professional Service**      **Reviewer**  
Intl. Conference on Computer Vision (ICCV)      2021  
Intl. Conference on Computer Vision and Pattern Recognition (CVPR)      2021  
International Conference on Learning Representations (ICLR)      2021  
Machine Learning in Computational Biology (MLCB)      2020  
Conference on Neural Information Processing Systems (NeurIPS)      2020

**Teaching**  
• Undergraduate Machine Learning      Fall 2020  
• Graduate Machine Learning      Fall 2019  
• Undergraduate Introduction to Algorithms      Fall 2016, Spring 2017  
• Undergraduate Introduction to Databases      Fall 2016, Spring 2017

**Relevant Graduate Coursework**      *GPA: 4.0*  
• Advanced Deep Learning (Fall 2017)  
• Advanced Machine Learning (Spring 2017)  
• Optimization for Machine Learning (Fall 2017)  
• Vision and Language (Spring 2017)  
• Deep Learning for Computer Graphics (Fall 2016)  
• Machine Learning (Fall 2016)

**Technical Skills**      Python, C/C++, PyTorch, Java, R, MATLAB, SQL, BigQuery