Lichen **Wang**

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Education

Sep. 2016 - Apr. 2021	**Northeastern University, Boston, USA** Doctors of Philosophy Major : Electrical & Computer Engineering, GPA : 4.0 *Advisor : Prof. Yun Raymond Fu* Thesis : Correlation Discovery for Multi-view and Multi-label Learning
Sep. 2013 - Jul. 2016	**Xi'an Jiaotong University, Xi'an, China** Master of Science in Engineering Major : Electrical & Computer Engineering, GPA : 3.3 *Advisor : Prof. Aimin Zhang* Thesis : Computer Vision Based PCB Defects Inspection System Implementation
Sep. 2009 - Jul. 2013	**Harbin Institute of Technology, Harbin, China** Bachelor of Engineering Major : Electrical Engineering, GPA : 3.7 *Advisor : Prof. Zhenshen Qu* Thesis : Foreign Matter Inspection of Infusion Bottle Based on Computer Vision

Field of Interests

Computer Vision, Machine Learning, Data Mining, Transfer Learning, Reinforcement Learning, Natural Language Processing

Skills

Programming Skills :	Python, C/C++, MATLAB.
Operation System :	Linux (Ubuntu), MacOS, Windows.
Software :	PyTorch, TensorFlow, OpenCV, Point Cloud Library, MATLAB/Simulink, Tableau, Multisim.

Experiences

- **Zillow Group, Seattle, USA.** Rich Media Experience.

Applied Scientist
2021.06-Present

3D Dataset processing and arrangement, Python
- Explore and arrange the Zillow Indoor dataset, implement format transformation.
- Floor plan similarity learning

Structure3D | Zillow Indoor Dataset | Smilarity Learning

- **Northeastern University, Boston, USA.** Electrical & Computer Engineering.

Research Assistant
2016.09-2021.04

Multi-label learning for image classification, annotation & retrieval, Python MATLAB
- Proposed methods which data-drivenly explore correlations between different labels.
- Active learning, GAN, and transfer learning strategies are explored for improving modelrobustness.
- Various real-world tasks (e.g., classification, auto-annotation & retrieval) are used for evaluation.

Multi-label Learning | Label Correlation | GAN | Low-rank | Active Learning | Transfer Learning | Domain Adaptation

Transfer Learning and Domain Adaptation, Python MATLAB
- Designed effective methods for improving the performances of tasks with limited training samples.
- Large-scale auxiliary data is fully explored, tuned, and used for enhance the target model robustness.

Domain Adaptation | Transfer Learning | Co-training | 3D | Image Generation | Incremental Learning | Life-long Learning

Human motion analysis on time series and multi-modal data, Python MATLAB
- Led a team for building a large-scale multi-modal (RGB-D, EMG, Skeleton) human action dataset.
- Explored latent data connections in time space for human action segmentation & classification.
- Utilized generative models for multi-modal data generation and solving data corruption challenges.

Action Recognition | Transfer Learning | Electromyography (EMG) | RGB-Depth | GAN | Multi-View | Sign Language

Teaching Assistant
2016.09-2021.04

Data Visualization (EECE5642), Python Tableau MATLAB
- Introduce basic visualization skills, methods, tools. Design and grade visualization projects.

Unsupervised Machine Learning (DS5230), Python MATLAB
- Introduction of traditional and deep learning-based unsupervised machine learning methods, including clustering, K-means, dimension reduction, autoencoder, and deep learning.

Computer Vision (EECE 5639), Python MATLAB C/C++
- Introduction of conventional computer vision background and algorithms including image capturing, filtering, reconstruction, segmentation, representation learning, and object detection.

- **Samsung Research America, Mountain View, USA.** Artificial Intelligence.

  Research Intern, 2020.05-2021.09

  Multi-view (RGB-D) visual saliency detection, Python
  - Explore small, efficient, and effective saliency detection model in a multi-view (RGB-D) scenario.

  Model Compression | Saliency Detection | Multi-View Learning | RGB-Depth | Multi-level Fusion

- **NEC Laboratorise America, Princeton, USA.** Data Science and System Security.

  Research Intern, 2019.05-2020.01

  Inductive and Unsupervised Graph Representation Learning, Python
  - Proposed effective and efficient algorithm for graph/structural data representation learning in unsupervised setting, and theoretical proof of the model effectiveness and stability is provided.
  - Experiments on various graph data (e.g., social network, academic connection, recommendation)

  Graph Isomorphism | Graph Similarity | Representation Learning | Autoencoder | Random Walk

  Reinforcement Learning-based Aspect-level Sentiment Recognition, Python
  - Proposed a general reinforcement learning method which mimics human-like mechanism for natural language processing, which leads to efficient, effective, and explainable NLP model.
  - Experiments on aspect-level sentiment classification in interpretable and efficient way.

  Natural Language Processing (NLP) | Reinforcement Learning | Sentiment Classification | Aspect-level | Interpretable

- **Zebra Technology, Lincolnshire, USA.** Chief Technology Office, Computer Vision Algorithm.

  Research Intern, 2018.05-2018.09

  3D Depth Imaging Systems and Methods for Dynamic Container Auto-Configuration, C/C++ Python
  - 3D Depth Imaging Systems and Methods for Dynamic Container Auto-Configuration
  - Vision-based object/human detection and human pose estimation.

  RGB-Depth | Point Cloud | Object Detection | Faster-RCNN | YOLO

  Research Intern, 2017.05-2017.09

  3D Object Detection, Localization, and Measurements, C/C++ Python
  - Systems and methods for automatic camera installation guidance based on 3D and RGB images.
  - QR code-based high accuracy and efficiency localization and identification.

  RGB-Depth | Point Cloud | Point Cloud Library (PCL) | 3D Deep Learning | Kinect | QR Code

Publications

- **Conferences & Journals**
  - **Lichen Wang**, Yunyu Liu, Hang Di, Can Qin, Gan Sun, Yun Fu, "Semi-supervised Dual Relation Learning for Multi-label Classification," *IEEE Transactions on Image Processing (TIP)*. [PDF]
  - Can Qin, Handong Zhao, **Lichen Wang**, Huan Wang, Yulun Zhang, Yun Fu, "Slow Learning and Fast Inference : Efficient Graph Similarity Computation via Knowledge Distillation," *Neural Information Processing Systems (NeurIPS)*, 2021. [PDF]
  - **Lichen Wang**, Bo Zong, Yunyu Liu, Can Qin, Wei Cheng, Wenchao Yu, Xuchao Zhang, Haifeng Chen, Yun Fu, "Aspect-based Sentiment Classification via Reinforcement Learning," *IEEE International Conference on Data Mining (ICDM)*, 2021. [PDF]
  - Chang Liu, **Lichen Wang**, Kai Li, Yun Fu, "Domain Generalization via Feature Variation Decorrelation," *ACM Multimedia (MM)*, 2021. [PDF]
  - Songyang Jiang, Bin Sun, **Lichen Wang**, Yue Bai, Kunpeng Li, Yun Fu, "Skeleton Aware Multi-modal Sign Language Recognition," *IEEE Computer Vision and Pattern Recognition (CVPR) Workshop*, 2021. [PDF]
  - **Lichen Wang**, Zhengming Ding, Yun Fu, "Generic Multi-label Annotation via Adaptive Graph and Marginalized Augmentation," *ACM Transactions on Knowledge Discovery from Data (TKDD)*. [PDF]
  - Can Qin, **Lichen Wang**, Qianqian Ma, Yu Yin, Huan Wang, Yun Fu, "Contradictory Structure Learning for Semi-supervised Domain Adaptation," *SIAM International Conference on Data Mining (SDM)*, 2021. [PDF]
  - Yue Bai, **Lichen Wang**, Zhiqiang Tao, Sheng Li, Yun Fu, "Correlative Channel-Aware Fusion for Multi-View Time Series Classification," *AAAI Conference on Artificial Intelligence*, 2021. [PDF]
  - Jiahua Dong, Yang Cong, Gan Sun, Bingtao Ma, **Lichen Wang** "I3DOL : Incremental 3D Object Learning without Catastrophic Forgetting," *AAAI Conference on Artificial Intelligence*, 2021. [PDF]
  - Yue Bai, **Lichen Wang**, Yunyu Liu, Yu Yin, Yun Fu, "Dual-Side Auto-Encoder for High-Dimensional Time Series Segmentation," *IEEE International Conference on Data Mining (ICDM)*, 2020. [PDF]
  - Yunyu Liu, **Lichen Wang**, Yue Bai, Can Qin, Zhengming Ding, and Yun Fu, "Generative View-Correlation Adaptation for Semi-Supervised Multi-View Learning," *European Conference on Computer Vision (ECCV)*, 2020. [PDF]
  - **Lichen Wang**, Bin Sun, Joseph Robinson, Taotao Jing, and Yun Fu, "EV-Action : Electromyography-Vision Multi-Modal Action Dataset," *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, 2020. [PDF]
  - **Lichen Wang**, Bo Zong, Qianqian Ma, Wei Cheng, Jingchao Ni, Wenchao Yu, Yanchi Liu, Dongjing Song, Haifeng Chen, Yun Fu, "Inductive and Unsupervised Representation Learning on Graph Structured Objects," *International Conference on Learning Representations (ICLR)*, 2020. [PDF]
  - **Lichen Wang**, Yunyu Liu, Can Qin, Gan Sun, Yun Fu, "Dual Relation Semi-supervised Multi-label Learning," *AAAI Conference on Artificial Intelligence (AAAI)*, 2020. [PDF]
  - Can Qin, Haoxuan You, **Lichen Wang**, C.-C. Jay Kuo, Yun Fu, "PointDAN : A Multi-Scale 3D Domain Adaption Network for Point Cloud Representation," *Neural Information Processing Systems (NeurIPS)*, 2019. [PDF]
  - **Lichen Wang**, Zhengming Ding, Seungju Han, Jae-Joon Han, Changkyu Choi, Yun Fu, "Generative Correlation Discovery Net-

work for Multi-Label Learning," *IEEE International Conference on Data Mining (ICDM) (Long paper)*, 2019. [PDF]
- Denghui Zhang, Junming Liu, Hengshu Zhu, Yanchi Liu, **Lichen Wang**, Pengyang Wang, Hui Xiong, "Job2Vec : Job Title Benchmarking with Collective Multi-View Representation Learning," *ACM International Conference on Information and Knowledge Management (CIKM) (Long paper)*, 2019. [PDF]
- **Lichen Wang**, Zhengming Ding, Zhiqiang Tao, Yunyu Liu, Yun Fu, "Generative Multi-View Human Action Recognition," *International Conference on Computer Vision (ICCV) (Oral)*, 2019. [PDF]
- Can Qin, **Lichen Wang**, Yulun Zhang, Yun Fu, "Generatively Inferential Co-Training for Unsupervised Domain Adaptation," *International Conference on Computer Vision (ICCV) Workshop (Best paper award)*, 2019. [PDF]
- Gan Sun, Yang Cong, **Lichen Wang**, Zhengming Ding, Yun Fu, "Online Multi-task Clustering for Human Motion Segmentation," *International Conference on Computer Vision (ICCV) Workshop*, 2019. [PDF]
- **Lichen Wang**, Zhengming Ding, Yun Fu, "Low-Rank Transfer Human Motion Segmentation," *IEEE Transactions on Image Processing (TIP)*. [PDF]
- Yulun Zhang, Kunpeng Li, Kai Li, **Lichen Wang**, Bineng Zhong, Yun Fu, "Image Super-Resolution Using Very Deep Residual Channel Attention Networks," *European Conference on Computer Vision (ECCV)*, 2019. [PDF]
- **Lichen Wang**, Zhengming Ding, Yun Fu, "Adaptive Graph Guided Embedding for Multi-label Annotation," *International Joint Conference on Artificial Intelligence (IJCAI)*, 2018. [PDF]
- **Lichen Wang**, Zhengming Ding, Yun Fu, "Learning Transferable Subspace for Human Motion Segmentation," *AAAI Conference on Artificial Intelligence (AAAI)*, 2018. [PDF]
- **Lichen Wang**, Aimin Zhang, Chujia Guo, Pervez Bhan, Tian Yan, "Modified Multi-target Recognition Based on CamCom," *Chinese Control Conference (CCC)*, 2015. [PDF]
- **Lichen Wang**, Aimin Zhang, Chujia Guo, Songyun Zhao, Pervez Bhan, "3-D Reconstruction for SMT Solder Joint Based on Joint Shadow," *Chinese Control and Decision Conference (CCDC)*, 2015. [PDF]

- **Patents**
  - Bo Zong, Haifeng Chen, **Lichen Wang**, "Reinforced Text Representation Learning," *under reviewed U.S. Invention Patent Application No. 62975280* [PDF]
  - Bo Zong, Haifeng Chen, **Lichen Wang**, "Unsupervised Graph Similarity Learning Based on Stochastic Subgraph Learning," *under reviewed U.S. Invention Patent Application No. 62902997* [PDF]
  - **Lichen Wang**, Yan Zhang, Kevin O'Connell, "Three-Dimensional (3D) Depth Imaging Systems and Methods for Dynamic Container Auto-Configuration," *granted U.S. Invention Patent No. 11010915* [PDF].
  - Yan Zhang, Kevin O'Connell, Jay Williams, **Lichen Wang**, "Systems and methods for automatic camera installation guidance (CIG)," *granted U.S. Invention Patent No. 10820307* [PDF].
  - **Lichen Wang**, Min Wu, Qinglin Liu, "Novel Methods and System for Evaporator Frosting Inspection," *granted China Invention Patent No. CN201511025257.3* [PDF].
  - Zhenshen Qu, **Lichen Wang**, Wenhua Jiao, Changlun Gao, Pengshan Ren, Haisheng Wang, "Novel Methods and System of Foreign Matter Inspection in Infusion Bottle," *granted China Invention Patent No. CN2013102084539* [PDF].

Honors & Awards

2020 AAAI Conference Student Travel Award
2019 ICDM Conference Student Volunteer Award
2017 AAAI Conference Student Travel Award
2015 Third prize of Microsoft Imagine Cup Competition (Shaanxi, China)
2013 Meritorious Winner of International Mathematical Contest in Modeling
2011 National Scholarship, China