Yang Li

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Education

Ph.D. in Computer Science, Stanford University, 2011 - 2017. GPA: 3.752

Dissertation: Exploiting Shared Structures in Large GPS Trajectory Datasets under Uncertainty
Advisor: Leonidas J. Guibas

B.A. Double major in Computer Science and Mathematics, Smith College, 2007 - 2011. GPA: 3.91

Honors Thesis: Inverse Kinematics Methods for the Protein Loop Closure Problem
Advisor: Ileana Streinu

Research Interests

Transferability estimation for transfer learning and its applications in pre-trained model adaptation; Collective and continual learning across multiple tasks, modalities and domains; Medical image understanding using heterogeneous data; Topological and geometric data analysis; Spatial-temporal data processing;

Research & Work Experience

Associate Professor without Tenure **Jan 2023 - Present**
Tsinghua-Berkeley Shenzhen Institute,
Tsinghua Shenzhen Graduate International School

Visiting Research Affiliate **Oct 2023 - Jan 2024**
Computer Science Department, University of Texas, Austin

Assistant Professor **October 2019 - Dec 2022**
Data Science and Information Technology Research Center, Tsinghua-Berkeley Shenzhen Institute,
Tsinghua Shenzhen Graduate International School

Postdoctoral Researcher **September 2017 - September 2019**
IoT and Cyber-Physical System Lab, Tsinghua-Berkeley Shenzhen Institute.
Principal Investigators: Lin Zhang, Khalid Mosalam

Graduate Research Assistant **July 2012 - December 2016**
Geometric Computing Lab, Stanford University. **September 2011 - March 2012**
Advisor: Leonidas J. Guibas

Graduate Research Assistant **April 2012 - June 2012**
First Year Research Rotation Program, Computer Science Department, Stanford University.
Advisor: Kenneth Salisbury

Undergraduate Fellow **May 2009 - April 2011**
Mellon Mays Undergraduate Research Fellowship Program, Smith College
Faculty mentor: Ileana Streinu

Research Assistant **May 2008 - August 2011**
Ileana Streinu, Computer Science Department, Smith College

Selected Fundings

National Natural Science Foundation of China project, "Optimizing Transfer Strategies for Medical Images via Latent Structure Learning among Heterogeneous Tasks" (62371270), Principle Investigator, funding: 500,000 CNY, 01/2024–12/2027.

National Natural Science Foundation of China project, "Heterogeneous Multi-Task Transfer Learning for Medical Image Understanding" (62001266), Principle Investigator, funding: 240,000 CNY, 01/2021–12/2023.

Selected Publications

Journal Papers

Jingge Wang, Liyan Xie, Yao Xie, Shao-Lun Huang and Yang Li*, Generalizing to Unseen Domains with Wasserstein Distributional Robustness under Limited Source Knowledge, in IEEE Journal of Selected Topics in Signal Processing, 2024 (Accepted)

Xinlei Chen, Baining Zhao, Xuzhe Wang, Tianyu Zhang, Rongye Shi, Fengli Xu, Fanhang Man, Erbing Chen, Yang Li, Yong Li, and Tao Sun, Estimating and modelling spontaneous mobility changes during the COVID-19 pandemic without stay-at-home orders, Humanities and Social Sciences Communications, 2024 (Accepted)

Yang Tan, Yang Li*, Shao-Lun Huang, and Xiao-Ping Zhang, Transferability-Guided Cross-Domain Cross-Task Transfer Learning, in IEEE Transactions on Neural Networks and Learning Systems, 2024

Hu, Fan, Weihong Zhang, Huazhen Huang, Wang Li, Yang Li, and Peng Yin, A Transferability-Based Method for Evaluating the Protein Representation Learning, in IEEE Journal of Biomedical and Health Informatics, 2024

Taurai Muvunza and Yang Li*, Session-based Recommendation with Temporal Dynamics for Large Volunteer Networks, Journal of Intelligent Information Systems, 2023

Shuailei Zhang, Kai Keng Ang, Dezhi Zheng, Qianxin Hui, Xinlei Chen, Yang Li, Ning Tang, Effie Chew, Rosary Yuting Lim, and Cuntai Guan. Learning EEG Representations With Weighted Convolutional Siamese Network: A Large Multi-Session Post-Stroke Rehabilitation Study. IEEE Transactions on Neural Systems and Rehabilitation Engineering 30: 2824-2833, 2022.

Anping Zhang, Ke Zhang, Wanda Li, Yue Wang, Yang Li*, Lin Zhang. Optimising Self-Organised Volunteer Efforts in Response to the COVID-19 Pandemic, Humanities and Social Sciences Communications, 9:134, 2022.

Fei Ma, Yang Li, Shiguang Ni, Shao-Lun Huang, and Lin Zhang. Data Augmentation for Audio-Visual Emotion Recognition with an Efficient Multimodal Conditional GAN, Applied Sciences 12, no. 1: 527. 2022

Dashuai Wang, Runfeng Cao, Shaogang Hao, Chen Liang, Guangyong Chen, Pengfei Chen, Yang Li, and Xiaolong Zou. Accelerated prediction of Cu-based single-atom alloy catalysts for CO_2 reduction by machine learning, Green Energy & Environment, 2021

Jing Lian, Yang Li, Weixi Gu, Shao-Lun Huang, Lin Zhang. Mining Regional Mobility Patterns for Urban Dynamic Analytics. Mobile Networks and Applications 25(2): 459-473, 2020

Yang Li, Dimitrios Gunopulos, Cewu Lu and Leonidas Guibas, Personalized Travel Time Prediction using a Small Number of Probe Vehicles, ACM Transactions on Spatial Algorithms and Systems, Special Issue on Urban Mobility: Algorithms and Systems, 2019.

Conference Papers

Liyan Chen, Yan Zheng, Yang Li, Lohit A. Jagarapu, Haoxiang Li, Hao Kang, Gang Hua and Qixing Huang. Enhancing Implicit Shape Generators Using Topological Regularizations, 2024 International Conference on Machine Learning (ICML'24) (Accepted)

Guoqing Zhang and Yang Li. A Geometric Algorithm for Blood Vessel Reconstruction from Skeletal Representation. The 20th International Symposium on Bioinformatics Research and Applications (ISBRA), 2024 (Accepted)

Hanbing Liu, Jingge Wang, Xuan Zhang, Ye Guo, and Yang Li*. Enhancing Continuous Domain Adaptation with Multi-Path Transfer Curriculum. The 28th The Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), 2024

Yanru Wu, Jianning Wang, Weida Wang and Yang Li*. H-ensemble: An Information Theoretic Approach to Reliable Few-Shot Multi-Source-Free Transfer. In Proceedings of the 38th AAAI Conference on Artificial Intelligence (AAAI'24), 2024

Dexu Kong, Anping Zhang, Yang Li*, Learning Persistent Community Structures in Dynamic Networks via Topological Data Analysis, in Proceedings of the 38th Annual AAAI Conference on Artificial Intelligence (AAAI'24), 2024.

Jingyun Yang, Yicong Li, Yang Tan, Heng Liu, and Yang Li. Investigating Consistency Constraints in Heterogeneous Multi-task Learning for Medical Image Processing, In 2023 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), Workshop on Deep Learning, 2023.

Guoqing Zhang, Caixia Dong and Yang Li*. Topology-Preserving Hard Pixel Mining for Tubular Structure Segmentation. The 34th British Machine Vision Conference (BMVC), 2023

Yang Tan, Yicong Li, Yang Li*, and Xiaoping Zhang. Efficient Prediction of Model Transferability in Semantic Segmentation Tasks, 2023 IEEE International Conference on Image Processing (ICIP'23), 2023

Yuanbo Tang, Zhiyuan Peng and Yang Li*. Explainable Trajectory Representation through Dictionary Learning, The 31th International Conference on Advances in Geographic Information Systems (SIGSPATIAL'23), 2023

Yicong Li, Yang Tan, Jingyun Yang, Yang Li*, and Xiao-Ping Zhang, Finding the Most Transferable Tasks for Medical Image Segmentation, In Proceedings of the 2022 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), 2022.

Jingyun Yang, Jie Hu, Yicong Li, Heng Liu and Yang Li*. Joint PVL Detection and Manual Ability Classification Using Semi-supervised Multi-task Learning. In Proceedings of Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), pp. 453-463. Springer, Cham, 2021.

Zihao Zhou, Aihua Ran, Shuxiao Chen, Guodan Wei, Hongbin Sun, Xuan Zhang* and Yang Li*. Few-Shot Cross Domain Battery Capacity Estimation. In Adjunct Proceedings of the 2021 ACM International Joint Conference on Pervasive and Ubiquitous Computing (Ubicomp) and Proceedings of the 2021 ACM International Symposium on Wearable Computers, pp. 703-711. 2021.

Yang Tan, Yang Li* and Shao-lun Huang. OTCE: A Transferability Metric for Cross-Domain Cross-Task Representations. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, pp. 15779-15788. 2021.

Jingge Wang, Yang Li*, Liyan Xie and Yao Xie. Class-conditioned Domain Generalization via Wasserstein Distributional Robust Optimization, Robust and Reliable Machine Learning in the Real World Workshop at ICLR, 2021

Mingyang Li, Yang Li, Shao-Lun Huang, Lin Zhang. Semantically Supervised Maximal Correlation For Cross-Modal Retrieval. In Proceedings of the 27th IEEE International Conference on Image Processing (ICIP '20), 2291-2295, 2020

Yihua Liang, Fei Ma, Yang Li, and Shao-Lun Huang. Person recognition with hgr maximal correlation on multimodal data. In Proceedings of the 25th International Conference on Pattern Recognition (ICPR '20), pp. 1-8. IEEE, 2021

Nikolaos Zygouras, Nikolaos Panagiotou, Yang Li, Dimitrios Gunopulos, and Leonidas Guibas. 2019. HTTE: A Hybrid Technique For Travel Time Estimation In Sparse Data Environments. In Proceedings of the 27th SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL '19), 2019

Jing Lian, Yang Li, Weixi Gu, Shao-Lun Huang and Lin Zhang, Mining Mobility Patterns with Trip-Based Traffic Analysis Zones: A Deep Feature Embedding Approach, In Proceedings of 2019 IEEE Intelligent Transportation Systems Conference (ITSC), 2019

Yajie Bao*, Yang Li*, Shao-Lun Huang, Lin Zhang, Lizhong Zheng, Amir R. Zamir, and Leonidas Guibas. An Information- Theoretic Metric to Transferability for Task Transfer Learning. In Proceedings of the 26th IEEE International Conference on Image Processing (ICIP), 2019. (*Joint first author)

Lu Li, Yang Li, Xiangxiang Xu, Shao-Lun Huang and Lin Zhang, Maximal Correlation Embedding Network for Multilabel Learning with Missing Labels, In Proceedings of 2019 IEEE International Conference on Multimedia and Expo (ICME), July 2019

Fei Ma, Wei Zhang, Yang Li, Shao-Lun Huang, and Lin Zhang, An End-to-End Learning Approach for Multimodal Emotion Recognition: Extracting Common and Private Information, In Proceedings of 2019 IEEE International Conference on Multimedia and Expo (ICME '19), July 2019

Jing Lian, Yang Li, Weixi Gu, Shao-Lun Huang, and Lin Zhang. Joint Mobility Pattern Mining with Urban Region Partitions. In EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous '18), 2018 (Best Paper Award)

Yang Li, Dimitrios Gunopulos, Cewu Lu and Leonidas Guibas, Urban Travel Time Prediction Using a Small Number of GPS-Floating Cars, 25th SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL '17), 2017.

Yang Li, Yangyan Li, Dimitrios Gunopulos, and Leonidas Guibas, Knowledge-Based Trajectory Completion from Sparse GPS Samples, In Proceedings of the 24th SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL '16), 2016

Yang Li, Qixing Huang, Michael Kerber, Li Zhang and Leonidas Guibas, Large-Scale Joint Map Matching of GPS Traces, In Proceedings of the 21th SIGSPATIAL International Conference on Advances in Geographic Information Systems (GIS '13), 2013.

Naomi Fox, Filip Jagodzinski, Yang Li, Ileana Streinu, *KINARI-Web: A Web Server for Protein Rigidity and Flexibility Analysis* , Nucleic Acids Research, 39 (Web Server Issue), 2011.

Invited Talks

Recent Progress on Transferability-guided Transfer Learning, The Hong Kong University of Science and Technology (Guangzhou), Feburary 22, 2024

Transferability Guided Transfer Learning, National and Kapodistrian University of Athens, June 12, 2023.

A Data Science Perspective on Social Self-Organization, TEDxShenzhen Conference, Aug 15th, 2022.

Measuring Transferability in Transfer Learning, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, Dec 12th, 2021

Using Maximal Correlation for Task Transferability Estimation and Multi-Modal Learning, 2nd TBSI Workshop on Data Science, Dec 18th, 2019

Using Maximal Correlation for Task Transferability Estimation and Multi-Modal Learning, Qian Xuesen Laboratory for Space Technology, CASC, Oct 11th, 2019

Using Maximal Correlation for Task Transferability Estimation and Multi-View Learning, Texas A&M University, College Station, July 10th, 2019

Exploiting Shared Structures in GPS Trajectory Data under Uncertainty , Smith College, Nov 12th, 2018

Community Service

Editorial Service

- Associated Editor, Franklin Open
- Editorial Board Member, Digital Signal Processing

Member

- IEEE Member, Signal Processing Society
- ACM Member

Chair & PC Member

- General Chair, 2nd IDI International Workshop on Learning and Information Theory, Aug 19-20, 2024 (In preparation)
- Competition Area Chair, IEEE 33rd International Workshop on Machine Learning for Signal Processing (MLSP), Rome, Italy, September 17-20, 2023
- General Co-Chair, 1st TBSI Workshop on Data Science, Shenzhen, China, Dec 17-19, 2019
- Publicity Chair, 2nd TBSI Workshop on Learning Theory, Shenzhen, China, July 20-22, 2020
- PC Member, 26th International Conference on Neural Information Processing, Sydney, Australia, Dec 12–15, 2019

Reviewer

IEEE Transaction on Multimedia, Digital Signal Processing, IEEE Transactions on Intelligent Transportation Systems, ACM Transactions on Spatial Algorithms and Systems, IEEE Transactions on Circuits and Systems for Video Technology, European Journal of Control, IEEE International Conference on Image Processing, International Conference on Artificial Intelligence and Statistics, IEEE Intelligent Transportation Systems Conference and etc.

Honors, Awards, & Fellowships

Best Paper Award, EAI International Conference on Mobile and Ubiquitous Systems (2018);
Stanford Graduate Fellowship in Science and Engineering, Stanford University (2012);

Teaching Experience

Lecturer: Compressive Sensing and Sparse Modeling: Theory, Algorithm and Applications **Summer 2024**
Tsinghua Shenzhen International Graduate School

Lecturer: Learning from Data **Fall 2019-2022, Spring 2024**
Tsinghua Shenzhen International Graduate School

Lecturer: Seminar in Data Science – Advanced Learning Representations **Spring 2022-2024**
Tsinghua Shenzhen International Graduate School

Lecturer: Introduction to Transfer Learning **Summer 2021, Spring 2022-2023**
Tsinghua Shenzhen International Graduate School

Lecturer: Data Mining: Theory and Applications **Fall 2020**
Tsinghua Shenzhen International Graduate School

Guest Lecturer: Introduction to Environmental Science, Energy and Information **Fall 2019**
Tsinghua-Berkeley Shenzhen Institute

Co-Lecturer: Learning from Data **Fall 2017**
Tsinghua-Berkeley Shenzhen Institute

Guest Lecturer: Hybrid Design and Smart City **Summer 2017**
Tsinghua-Berkeley Shenzhen Institute