Yi **Xu**

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Education

Sept. 2020 – 2025 (Expected) **Northeastern University, Boston, USA**
Ph.D. Candidate of Electrical & Computer Engineering
Advisor : Prof. Yun Raymond Fu

Sept. 2017 – Jun. 2020 **Xi'an Jiaotong University, Xi'an, China**
Master of Control Science and Engineering GPA : 85.07/100 Rank : 2/152
Advisor : Prof. Jing Yang & Prof. Shaoyi Du
Thesis : Pedestrian Trajectory Prediction in Complex Scenes.

Sept. 2013 – Jun. 2017 **Xi'an Jiaotong University, Xi'an, China**
Bachelor of Automation GPA : 82.53/100
Advisor : Prof. Longjun Liu & Prof. Pengju Ren
Thesis : Hardware-Friendly Compression Algorithm for Convolutional Neural Networks.

Fields of Interests

Computer Vision, Machine Learning, Behavior Prediction, Transfer Learning, Representation Learning for Time Series

Publications

- **Conferences & Journals**
  - **Yi Xu**, Armin Bazarjani, Hyung-gun Chi, Chiho Choi, Yun Fu, "Uncovering the Missing Pattern : Unified Framework Towards Trajectory Imputation and Prediction." *2023 IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR)*.
  - **Yi Xu**, Lichen Wang, Yizhou Wang, Yun Fu, "Adaptive Trajectory Prediction via Transferable GNN." *2022 IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR)*. [Paper]
  - **Yi Xu**, Lichen Wang, Yizhou Wang, Can Qin, Yulun Zhang, Yun Fu, "MemREIN : Rein the Domain Shift for Cross-Domain Few-Shot Learning." *2022 International Joint Conference on Artificial Intelligence (IJCAI)*. [Paper]
  - **Yi Xu***, Dongchun Ren*, Mingxia Li*, Yuehai Chen, Mingyu Fan, Huaxia Xia, "Tra2Tra : Trajectory-to-Trajectory Prediction with a Global Social Spatial-Temporal Attentive Neural Network." *IEEE Robotics and Automation Letters (RA-L)/2021 International Conference on Robotics and Automation (ICRA)* . [Paper]
  - **Yi Xu**, Dongchun Ren, Mingxia Li, Yuehai Chen, Mingyu Fan, Huaxia Xia, "Robust Trajectory Prediction of Multiple Interacting Pedestrians via Incremental Active Learning." *2021 International Conference on Neural Information Processing (ICONIP)*. [Paper]
  - **Yi Xu***, Jing Yang*, Shaoyi Du, "CF-LSTM : Cascaded Feature-Based Long Short-Term Networks for Predicting Pedestrian Trajectory." *2020 AAAI Conference on Artificial Intelligence (AAAI)*. [Paper]
  - Hyung-gun Chi, Kwonjoon Lee, Nakul Agarwal, **Yi Xu**, Karthik Ramani, Chiho Choi, "AdamsFormer for Spatial Action Localization in the Future." *2023 IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR)*.
  - Yitian Zhang, Yue Bai, Huan Wang, **Yi Xu**, Yun Fu, "Look More but Care Less in Video Recognition." *2022 Conference on Neural Information Processing Systems (NeurIPS)*.
  - Yizhou Wang, Can Qin, Yue Bai, **Yi Xu**, Xu Ma, Yun Fu, "Making Reconstruction-based Method Great Again for Video Anomaly Detection." *2022 IEEE International Conference on Data Mining (ICDM)*.
  - Yizhou Wang, Can Qin, Rongzhe Wei, **Yi Xu**, Yue Bai, Yun Fu, "Self-supervision Meets Adversarial Perturbation : A Novel Framework for Anomaly Detection." *2022 ACM International Conference on Information and Knowledge Management (CIKM)*. [Paper]
  - Yanliang Zhu*, Dongchun Ren*, **Yi Xu***, Deheng Qian*, Mingyu Fan*, Xin Li*, Huaxia Xia*,"Simultaneous Past and Current Social Interaction-aware Trajectory Prediction for Multiple Intelligent Agents in Dynamic Scenes." *ACM Transactions on Intelligent Systems and Technology (TIST)* 2021. [Paper]
  - Jing Yang, **Yi Xu**, Haijun Rong, Shaoyi Du, Badong Chen, "Sparse Recursive Least Mean p-Power Extreme Learning Machine for Regression,"*IEEE Access* 2018. [Paper]
  - Yuehai Chen, Jing Yang, Kun Zhang, **Yi Xu**, Yuewen Liu, "A Feature-Cascaded Correntropy LSTM for Tourists Prediction," *IEEE Access* 2021. [Paper]
  - Jing Yang, **Yi Xu**, Haijun Rong, Shaoyi Du, Hongmei Zhang, "A Method for Wafer Defect Detection Using Spatial Feature Points Guided Affine Iterative Closest Point Algorithm," *IEEE Access* 2020. [Paper]
- **Pre-prints**
  - Yizhou Wang, Yue Kang, Can Qin, **Yi Xu**, Huan Wang, Yulun Zhang, Yun Fu, "Adapting Stepsizes by Momentumized Gradients Improves Optimization and Generalization." [Paper]
- **Patents**

- **Yi Xu**, Mingyu Fan, Dongchun Ren, Huaxia Xia, Yaxuan Dai, Deheng Qian, Yanliang Zhu, "An Obstacle Trajectory Prediction Method." *Granted China Invention Patent No. CN112348293A*.
- Mingyu Fan, **Yi Xu**, Dongchun Ren, Huaxia Xia, Yanliang Zhu, Deheng Qian, "A Model Training Method." *Granted China Invention Patent No. CN112990375B*.
- Mingyu Fan, Jiawen Huang, Dongchun Ren, Huaxia Xia, **Yi Xu**, "Model Training Method for Obstacle Trajectory Prediction Based on Transfer Learning." *Granted China Invention Patent No. CN113325855A*.

Competitions

INTERACTION-Dataset-Based PREdicTion (INTERPRET) Challenge in NeurIPS2020 | Vehicle Future Trajectory Prediction

- Proposed dual transformer-based method to extract impact spatial-temporal feature representations.
- Won $\mathbf{1}^{st}$ Place of the Generalizability Track and $\mathbf{2}^{nd}$ Place of the Regular Track.

Experiences

Research Assistant
2020.09 – Present

Northeastern University, Boston, USA. Computer Vision | Transfer Learning | Few-Shot Learning | Time Series
▷**SMILE Lab.**
- Proposed effective behavior prediction methods to generalize to novel environments.
- Delved into the behavior (i.e. trajectory, motion) prediction and understanding problem.
- Explored unsupervised representation learning methods for time series.
- Supervisor : Prof. Yun Raymond Fu

GNN | CNN | Self-/Cross-Attention | Transformer

Research Intern
2022.05 – 2022.09

Honda Research Institute, San Jose, USA. Behavior Prediction | Pattern Recognition | Computer Vision
▷**Cognition Team.**
- Proposed a unified framework for the joint problem of trajectory imputation and prediction, which is the pioneer which fills the gap in benchmarks and techniques for this joint problem.
- Curated three practical datasets for the joint problem of trajectory imputation and prediction.
- Supervisor : Dr. Chiho Choi

GNN | CVAE | VRNN | GAN

Research Intern
2020.06 – 2020.09

Meituan, Beijing, China. Motion Prediction | Pattern Recognition | Computer Vision
▷**Autonomous Delivery Center.**
- Proposed effective methods for pedestrian/vehicle trajectory prediction in complex scenes.
- Explored the importance of different trajectory samples with active learning and self-paced learning.
- Supervisor : Prof. Mingyu Fan

GNN | RNN | GAN | Transformer | Active Learning | Self-Paced Learning

Research Assistant
2017.09 – 2020.06

Xi'an Jiaotong University, Xi'an, China. Computer Vision | Machine Learning
▷**Institute of Artificial Intelligence and Robotics.**
- Extra restrictions are explored for better point cloud registration.
- Attention mechanism, correntropy are utilized for interaction-aware pedestrian trajectory prediction.

Iterative Closest Point Algorithm | Attention Mechanism | LSTM | Correntropy

Research Assistant
2016.06 – 2016.08

Xi'an Jiaotong University, Xi'an, China. Machine Learning | Optimization
▷**Information-Technology Talent Program.**
- Various methods are explored for avoiding getting stuck in the local optimal.
- Proposed robust strategies for improve the performance of the fireworks algorithm.

Evolutionary Algorithms | Fireworks Algorithm | Particle Swarm Optimization

Projects

Hardware (FPGA) Project with Xilinx Company | Reinforcement Learning for Obstacle Avoidance

- Proposed effective algorithms for obstacle avoidance via reinforcement learning.
- Designed efficient parallel operation pipeline at the global level for hardware implementation on FPGA.

Awards

2022 Travel Award of PhD Network Northeastern University.
2022 Travel Award of CVPR 2022.
2018 National Scholarship (Highest Honor in China).
2018 Excellent Graduate Student of Xi'an Jiaotong University.
2018 Third Prize of the 15th Mathematical Contest in Modeling.
2018 Third Prize of the 4th Future Flight Vehicle Innovation Competition.

Skills

Languages	Python, MATLAB, C/C++.
Tools	VS Code, Docker, VIVADO.
Frameworks	PyTorch, PyTorch Geometric, TensorFlow.