Yi **Xu**

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Education

Sept. 2020 – Present **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. Pengju Ren
Thesis : Hardware-Friendly Compression Algorithm for Convolutional Neural Networks.

Fields of Interests

Computer Vision, Machine Learning, Temporal Prediction, Pattern Recognition, Transfer Learning, Data Mining

Publications

- **Conferences & Journals**
  - **Yi Xu**, Lichen Wang, Yizhou Wang, Can Qin, Yulun Zhang, Yun Fu, "MemREIN : Rein the Domain Shift for Cross-Domain Few-Shot Learning." *International Joint Conference on Artificial Intelligence (IJCAI)* 2022.
  - **Yi Xu**, Lichen Wang, Yizhou Wang, Yun Fu, "Adaptive Trajectory Prediction via Transferable GNN." *Conference on Computer Vision and Pattern Recognition (CVPR)* 2022.
  - **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) / International Conference on Robotics and Automation (ICRA)* 2021.
  - **Yi Xu**, Dongchun Ren, Mingxia Li, Yuehai Chen, Mingyu Fan, Huaxia Xia, "Robust Trajectory Prediction of Multiple Interacting Pedestrians via Incremental Active Learning." *International Conference on Neural Information Processing (ICONIP)* 2021.
  - **Yi Xu***, Jing Yang*, Shaoyi Du, "CF-LSTM : Cascaded Feature-Based Long Short-Term Networks for Predicting Pedestrian Trajectory." *AAAI Conference on Artificial Intelligence (AAAI)* 2020.
  - 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.
  - Jing Yang, **Yi Xu**, Haijun Rong, Shaoyi Du, Badong Chen, "Sparse Recursive Least Mean p-Power Extreme Learning Machine for Regression,"*IEEE Access* 2018.
  - Yuehai Chen, Jing Yang, Kun Zhang, **Yi Xu**, Yuehu Liu, "A Feature-Cascaded Correntropy LSTM for Tourists Prediction," *IEEE Access* 2021.
  - 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.
- **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."
  - Yizhou Wang, Can Qin, Rongzhe Wei, **Yi Xu**, Yue Bai, Yun Fu, "SLA^{2}P : Self-supervised Anomaly Detection with Adversarial Perturbation."
- **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 **1**st Place of the Generalizability Track and **2**nd Place of the Regular Track.

Experiences

Research Assistant
2020.09 – Present

Northeastern University, Boston, USA. Computer Vision | Transfer Learning | Few-Shot Learning
▷**SMILE Lab.**
- Propose effective methods for enhancing the robustness of models to generalize to unseen domains.
- Delved into motion prediction and action recognition from the multi-task perspective.

GNN | CNN | Self-/Cross-Attention

Research Intern
2022.05 – 2022.09

Honda Research Institute, San Jose, USA. Behavior Prediction | Pattern Recognition | Computer Vision
▷**Cognition Team.**
- Delve into trajectory imputation and forecasting.

GNN | CVAE | GAN

Research Intern
2020.06 – 2020.08

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.

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 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.