Yifei Xu | Curriculum Vitae

520 Portola Plaza, 8125 Math Sciences Bldgs – Los Angeles, CA, 90095 – USA

+1 310-571-8346 • fei960922@ucla.edu • yfxu.me • yifei-xu-ucla

Research Interest: Generative Learning, Computer Vision, Reinforcement Learning, Autonomous Driving
Skill: Python, Tensorflow, Pytorch, C++, R, Matlab, Java, PHP, MySQL, Javascript, etc.

Education

University of California, Los Angeles — **Los Angeles, United States**
Ph.D. candidate in Statistics, Advisor: Prof. Ying Nian Wu — *Sept. 2017 – Present*
- Working at the Center for Vision, Cognition, Learning, and Autonomy (VCLA)
- GPA : **3.98** / 4.00

Shanghai Jiao Tong University — **Shanghai, China**
Bachelor of science in engineering, Computer Science — *Sept. 2013 – June 2017*
- ACM Honor Class, Zhiyuan College (a pilot CS class in China)
- Major GPA : **3.83** / 4.00

University of California, Los Angeles — **Los Angeles, CA, United States**
Summer Program in Statistics — *July 2016 – Sept. 2016*
- Cross-disciplinary Scholars in Science and Technology Program
- GPA : **4.00** / 4.00

Research Experience

University of California, Los Angeles — **Los Angeles, CA, United States**
Center for VCLA, Advisor: Prof. Ying Nian Wu — *July 2016 - Present*
- **Inverse Reinforcement Learning by Energy-based Model**
  - Cooperate both model-based and model-free approach; Apply on various task in RL and controls.
- **Learning Generative ConvNet with Continuous Latent Factors**
  - *Model* : A non-linear generalization of factor analysis where the mapping is parametrized by CNN;
  - Optimized image synthesis training on large-scale images by batch normalization;
  - Used new Back-Propagation inferenced by gradient descent / Langevin dynamics.
- **Generative Hierarchical Structure Learning of Sparse FRAME Models**
  - *Model* : Sparse FRAME, a multi-layer probability distribution model captured the part deformation;
  - Designed experiments for Sparse FRAME model on detection and clustering;
  - Compared Sparse FRAME model with DPM, And-or Graph on point, part, object level detection.

Baidu Research — **Sunnyvale, CA, United States**
Cognitive Computing Lab – Research Intern (part-time), Mentor: Ping Li — *Sept. 2021 – Dec. 2021 (est.)*
- **Designed and implemented the united framework for Energy-based Model on Paddlepaddle and Pytorch**

Snap Research — **Los Angeles, CA, United States**
Creative Vision team – Research Intern, Mentor: Sergey Tulyakov — *June 2021 – Sept. 2021*
- **Energy-based Implicit Function for 3D Shape Representation**
  - *Method*: Use energy-based model to represent objects in 3D space;
  - Improved generating capability by incorporating VAE and EBM; Better versatility compared to DeepSDF.

Alibaba DAMO Academy USA — **Bellevue, WA, United States**
Decision Intelligence Lab – Research Intern, Mentor: Jingqiao Zhang — *July 2020 – Sept. 2020*
- **SAS: Self-Augmented Strategy for self-supervised learning**
  - *Method*: A model-based data augmentation strategy without the separated generator;
  - Performance is comparable to SOTA result ELECTRA with 33% less computing cost.

Hikvision Research USA — **Santa Clara, CA, United States**
Research Group – Research Intern, Mentor: Jianwen Xie — *June 2019 – Sept. 2019*
- **3D Pointcloud Generation by Energy-based Model**
  - *Method*: The first energy-based model 3D point cloud via Langevin Dynamic.

Isee Inc. — **Boston, MA, United States**
Planning Group – Research Intern, Mentor: Chris Baker — *July 2018 – Sept. 2018*

- **Continuous Inverse Optimal Control via Langevin Sampling to learn trajectory prediction**
  - *Model*: A sample-based inverse reinforcement learning model driven by Energy-based Model;
  - Energy function is formed by neural network enhanced human-crafted cost function;
  - Langevin Dynamic is used to generate trajectories by sampling in energy-based distribution.

- **Shanghai Jiao Tong University** — **Shanghai, China**
  Computer and Machine Intelligence Lab, Advisor: Liqing Zhang — *July 2015 – June 2017*
  - **Large-scale image retrieval competition**
    - *Model*: A model with saliency detection, image classification and image retrieval;
    - Implemented Saliency Detection combining Dense and Sparse Reconstruction by Bayesian Integration;
  - **Interactive Image Search for Clothing Recommendation**
    - *Model*: Hybrid Topics Model, An LDA based model integrates both visual and text information;
    - Used multi-trained Fast-RCNN to localize regions; Introduced a demand-adaptive retrieval strategy.

- **Microsoft Research in Asia** — **Beijing, China**
  Visual Computing Lab – Research Intern, Mentor: Fang Wen — *Sept. 2016 – Feb. 2017*
  - **Joint Face Detection and Alignment via Cascaded Compositional Learning**
    - *Model*: Jointed cascade face detection and alignment by advanced boosting algorithm;
    - Trained multi domain on same random forest with both detection and alignment in parallel.

Publication

- **Yifei Xu**†, Jingqiao Zhang†, Ru He†, Liangzhu Ge†, Chao Yang, Cheng Yang, Ying Nian Wu "*SAS: Self-Augmented Strategy for Language Model Pre-training*" AAAI 2022 (†:co-first author)
- **Yifei Xu**†, Jianwen Xie†, Zilong Zheng, Song-Chun Zhu, Ying Nian Wu "*Generative PointNet: Deep Energy-Based Learning on Point Sets for 3D Generation and Reconstruction*" CVPR 2021 (†:co-first author)
- **Yifei Xu**, Jianwen Xie, Tianyang Zhao, Chris Baker, Yibiao Zhao, Ying Nian Wu "*Energy-based Continuous Inverse Optimal Control*" NeurIPS workshop on Machine Learning for Autonomous Driving, 2020
- Tianyang Zhao, **Yifei Xu**, Mathew Monfort, Wongun Choi, Chris Baker, Yibiao Zhao, Yizhou Wang, Ying Nian Wu "*Multi-Agent Tensor Fusion for Contextual Trajectory Prediction*" CVPR 2019
- Jianwen Xie, **Yifei Xu**, Erik Nijkamp, Ying Nian Wu, Song-Chun Zhu "*Generative Hierarchical Structure Learning of Sparse FRAME Models*" CVPR 2017
- Zhengzhong Zhou, **Yifei Xu**, Jingjin Zhou and Liqing Zhang "*Interactive Image Search for Clothing Recommendation*" ACM MultiMedia 2016.

Honor and Awards

Prize B, C, B: Academic Excellence Scholarship at SJTU(Top 10%, 20%, 10% in University) *2014-2016*
Meritorious Winner: Interdisciplinary Contest in Modeling 2016 *Apr. 2016*
UCLA CSST Scholarship and CSST Award: (2 in CSST Program CS Major) *Jul. 2016*
'ele' Scholarship: for outstanding CS students (6 in university each year) *Oct. 2016*
'YuanKang' Scholarship: for outstanding research (5 in university each year) *Dec. 2016*
SJTU Excellent Bachelor's Degree Thesis: (Top 1% in 3600 Undergraduates) *June 2017*

Project Experience

Game AI
- <FishTank> Game AI + GUI System
- <Hold'em> Game AI

System
- Simulated Advanced Pipeline CPU *(in verilog)*
- Virus for Linux *(spread, hide itself)*
- Full functional SQL System
- C STL container *(hashmap, treemap, deque...)*
- Compiler for simplified C *(to MIPS code)*

Web
- Bookex System *(recommendation system)*
- ACM New Website *(responsive)*

Machine Learning
- Implicit Discourse Parsing *(via SVM, CNN, RNN)*
- Multi-label Text Classification *(via ELMo, label attention)*
- Trajectory Compression *(car GPS)*
- EM Algorithm Implementation

* Please see detailed CV at: https://yfxu.me/cv.html and codes at github page: https://github.com/fei960922