Weijian Xu

Contact Information

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Research Interests

Deep Learning and Computer Vision

Education

University of California San Diego, La Jolla, CA **2018-2022**
Ph.D. in Computer Science
- Advisor: Prof. Zhuowen Tu
- Co-advisor: Prof. Hao Su

University of California San Diego, La Jolla, CA **2016-2018**
M.S. in Computer Science
- Overall GPA: 3.97/4.00
- AI track GPA: 4.00/4.00

Beihang University, Beijing, China **2012-2016**
B.E. in Computer Science
- Selected into Honors College
- Overall GPA: 3.88/4.00

Research Experience

Microsoft Cloud and AI, Bellevue, WA **2022-Present**
Researcher
Member of the Azure Cognitive Services Research team. Focus on large-scale visual-language pretraining and principled hyperparameter transfer techniques in scalable training.

University of California San Diego, La Jolla, CA **2017-2022**
Graduate Research Assistant, Advisor: Prof. Zhuowen Tu
- Focus on structural representation learning and apply it to a wide range of applications.
- Explored the Transformers in vision models, focusing on task decoder and backbone design. Related works are accepted by CVPR 2021 and ICCV 2021.
- Developed an attentional constellation model for few-shot image classification. This work is accepted by ICLR 2021.
- Developed a geometry-aware skeleton detection method with a weighted Hausdorff distance and a geometrically weighted cross-entropy loss. This work is accepted by BMVC 2019.
- Developed the Wasserstein introspective neural network and applied it to 2D and 3D generative models. Related works are accepted by CVPR 2018 and AAAI 2019.

Microsoft AI - Autonomous Systems, Redmond, WA **2021**
Research Intern, Mentor: Dr. Shuang Ma
Developed a Transformer-based multi-modal representation for autonomous tasks.

Microsoft Cloud and AI, Redmond, WA **2020**
Research Intern, Mentor: Dr. Baoyuan Wang
Developed a self-supervised face representation learning framework for detection, tracking and other downstream tasks.

Facebook AI Applied Research, Menlo Park, CA **2019**
Research Intern, Mentor: Prof. Tamara Berg
Developed a robust fashion representation for instance retrieval task by restoring deformed instances and masking occluded features.

Microsoft Research Asia, Beijing, China **2018**
Research Intern, Mentor: Dr. Jingdong Wang
Developed a few-shot learning algorithm by applying task-dependent disentangled feature transformation into feature embedding.

Publications

10. Justin Lazarow, **Weijian Xu**, and Zhuowen Tu. Instance Segmentation With Mask-Supervised Polygonal Boundary Transformers. In *IEEE/CVF Computer Vision and Pattern Recognition* (CVPR), 2022.

9. **Weijian Xu***, Yifan Xu*, Tyler Chang, and Zhuowen Tu. Co-Scale Conv-Attentional Image Transformers. In *IEEE/CVF International Conference on Computer Vision* (ICCV), 2021 (**Oral**, 3.4% acceptance rate).

8. Tyler Chang, Yifan Xu, **Weijian Xu**, and Zhuowen Tu. Convolutions and Self-Attention: Re-interpreting Relative Positions in Pre-trained Language Models. In *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing* (ACL-IJCNLP), 2021.

7. Yifan Xu*, **Weijian Xu***, David Cheung, and Zhuowen Tu. Line Segment Detection Using Transformers without Edges. In *IEEE/CVF Computer Vision and Pattern Recognition* (CVPR), 2021 (**Oral**, 4.3% acceptance rate).

6. Ke Li*, Shijie Wang*, Xiang Zhang*, Yifan Xu, *Weijian Xu*, and Zhuowen Tu. Pose Recognition with Cascade Transformers. In *IEEE/CVF Computer Vision and Pattern Recognition* (CVPR), 2021.

5. **Weijian Xu***, Yifan Xu*, Huaijin Wang*, and Zhuowen Tu. Attentional Constellation Nets for Few-Shot Learning. In *The Ninth International Conference on Learning Representations* (ICLR), 2021.

4. Zheng Ding, Yifan Xu, **Weijian Xu**, Gaurav Parmar, Yang Yang, Max Welling, and Zhuowen Tu. Guided Variational Auto-Encoder for Disentanglement Learning. In *IEEE/CVF Computer Vision and Pattern Recognition* (CVPR), 2020.

3. **Weijian Xu**, Gaurav Parmar, and Zhuowen Tu. Geometry-Aware End-to-End Skeleton Detection. In *British Machine Vision Conference* (BMVC), 2019.

2. Wenlong Huang*, Brian Lai*, **Weijian Xu**, and Zhuowen Tu. 3D Volumetric Modeling with Introspective Neural Networks. In *the Thirty-Third AAAI Conference on Artificial Intelligence* (AAAI), 2019.

1. Kwonjoon Lee, **Weijian Xu**, Fan Fan, and Zhuowen Tu. Wasserstein Introspective Neural Networks. In *IEEE/CVF Computer Vision and Pattern Recognition* (CVPR), 2018 (**Oral**, 2.1% acceptance rate).

Invited Talks

CSE Research Open House, University of California San Diego — **2021**
Exploring Transformers in Visual Representation Learning

Azure Cognitive Services Research, Microsoft — **2021**
Exploring Visual Structural Priors in Deep Representation Learning

Awards

NeurIPS Outstanding Reviewer (Top 8%) — **2021**

NeurIPS Top 10% Reviewer — **2020**

GSA Travel Grant in UC San Diego — **2018**

National Scholarship of China — **2015**

Honorable Prize in the Interdisciplinary Contest in Modeling — **2015**

Teaching Experience

Teaching Assistant, University of California San Diego — **Winter 2022**
CSE 252B - Computer Vision II

Teaching Assistant, University of California San Diego — **Fall 2021**
CSE 152A - Introduction to Computer Vision I

Teaching Assistant, University of California San Diego — **Spring 2021**
CSE 151A - Introduction to Machine Learning

Teaching Assistant, University of California San Diego — **Winter 2021**
CSE 152A - Introduction to Computer Vision I

Teaching Assistant, University of California San Diego — **Winter 2020**
COGS 118A - Supervised Machine Learning Algorithms

Teaching Assistant, University of California San Diego — **Spring 2019**
COGS 181 - Neural Networks and Deep Learning

Teaching Assistant, University of California San Diego — **Winter 2018**
COGS 118A - Introduction to Machine Learning I

Professional Activity

Conference Reviewer:

- ICLR, CVPR, NeurIPS. — **2022**
- CVPR, ICCV, NeurIPS. — **2021**
- AAAI, CVPR, ECCV, NeurIPS. — **2020**
- CVPR, ICCV. — **2019**

Journal Reviewer:

- TPAMI.

Misc.

Languages and Frameworks: Python, C/C++, PyTorch.

Development Environment: Linux/Unix, macOS and Windows.

Fluent in English and Chinese.