Jiangxin Sun

M.S. Student · School of Computer Science and Engineer

Sun Yat-sen University, Guangzhou, Guangdong, China

(+86) 15135370082 | sunjx5@mail2.sysu.edu.cn

Education

Sun Yat-sen University   *Guangzhou, China*

M.S. Student in Computer Science and Technology   *Sep. 2020 - Present*

- Intelligence Science and System Lab

Sun Yat-sen University   *Guangzhou, China*

B.S. in Computer Science and Technology   *Sep. 2016 - Jun. 2020*

- GPA: 3.9/4.0

Research Interests

- My research interests lie in Computer Vision and Machine Learning. Currently, my focus is on object detection/ tracking, semantic/instance segmentation prediction and 3D human motion capture/prediction.

Research Experience

Instance Segmentation Prediction   *Jul. 2018 - Present*

Undergraduate & Graduate Researcher in Sun Yat-sen University

- Advisors: Prof. **Wei-Shi Zheng** & Assoc. Prof. **Jian-Fang Hu**
- Aims to predict future unobserved instance segmentation according to observed past RGB frames. The mainstream is to insert a prediction block into an instance segmentation model (i.e. Mask R-CNN) and to predict future pyramid features.
- Proposed an adaptive aggregation approach to **exploit structural relationship** among pyramid features. Our designed auto-path can selectively and adaptively aggregate contextual information among different pyramid levels.
  Preliminary work accepted by **ACM MM** 2019 & Revised version accepted by **TPAMI** in 2021.
- Pointed out the contradiction between learning discriminative segmentation features and learning reliable future prediction. Designed an autoencoder-based framework to **learn predictive features** for future segmentation prediction.
  Accepted by **ICCV** 2021.

3D Human Motion Prediction   *Jul. 2020 - Jul. 2021*

Graduate Researcher in Sun Yat-sen University & Computer Vision Group Intern in Huya Inc.

- Advisors: Assoc. Prof. **Jian-Fang Hu** & Dr. **Xintong Han**
- Aims to predict future unobserved human motion (3D mesh) according to observed past RGB frames. The mainstream is to insert a prediction block into a 3D pose estimation model and to predict future latent features.
- Introduced action information into human motion prediction. Since actions with a certain type consists of common atoms, human motion can be better predicted with future **action-specific motion dynamics** stored in the memory bank.
  Accepted by **NeurIPS** 2021.

Dance Generation   *Aug. 2021 - Jan. 2022*

Intelligent Multimedia Group Intern in MSRA

- Advisor: Dr. **Chunyu Wang**
- Aims to predict future dance choreography conditioned on past motion and music piece. The mainstream is to learn single-model feature extractors and a cross-modal predictor.
- Achieved non-freezing large-magnitude dance generation. We present **bank-constrained manifold projection** to reduce the noises in the predicted motions and model the coherence in <past, future> motion dynamics to reduce the uncertainty and ambiguity in motion prediction.
  Manuscript submitted to NeurIPS 2022.

Publications

Journal Articles

APANet: Auto-Path Aggregation for Future Instance Segmentation Prediction
  Jian-Fang Hu, Jiangxin Sun, Zihang Lin, Jian-Huang Lai, Wenjun Zeng, Wei-Shi Zheng
  IEEE Transactions on Pattern Analysis and Machine Intelligence, pp. 3386–3403, 2022

Conference Proceedings

Action-guided 3D Human Motion Prediction

Jiangxin Sun, Zihang Lin, Xintong Han, Jian-Fang Hu, Jia Xu, Wei-Shi Zheng

Thirty-Fifth Conference on Neural Information Processing Systems, 2021

Predictive Feature Learning for Future Segmentation Prediction

Zihang Lin*, **Jiangxin Sun***, Jian-Fang Hu, Qizhi Yu, Jiang-Huang Lai, Wei-Shi Zheng (* equal contribution)

Proceedings of the IEEE International Conference on Computer Vision, 2021

Predicting future instance segmentation with contextual pyramid convlstms

Jiangxin Sun, Jiafeng Xie, Jian-Fang Hu, Zihang Lin, Jianhuang Lai, Wenjun Zeng, Wei-Shi Zheng

Proceedings of the ACM International Conference on Multimedia, 2019