Jiangxin Sun

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Education

Sun Yat-sen University *Sep. 2020 - Jun. 2023*

M.E. in Computer Science and Technology

- Supervisors: Prof. **Wei-Shi Zheng** & Prof. **Jian-Fang Hu**

Sun Yat-sen University *Aug. 2016 - Jun. 2020*

B.E. in Computer Science and Technology

- GPA: 3.9/4.0

Research Interests

- My research interests lie in Computer Vision and Machine Learning. I am very interested in developing perceptual systems and decision-making systems. Currently, my focus is on autonomous driving system, instance segmentation prediction and 3D human motion prediction.

Publications

Journal Articles

APANet: Auto-Path Aggregation for Future Instance Segmentation Prediction [Link]
Jian-Fang Hu*, **Jiangxin Sun***, Zihang Lin, Jian-Huang Lai, Wenjun Zeng, Wei-Shi Zheng (* equal contribution)
*IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**),* 2021

Conference Proceedings

You Never Stop Dancing: Non-freezing Dance Generation via Bank-constrained Manifold Projection [Link]
Jiangxin Sun, Chunyu Wang, Huang Hu, Hanjiang Lai, Zhi Jin, Jian-Fang Hu
*Advances in Neural Information Processing Systems (**NeurIPS**)*, 2022

Action-guided 3D Human Motion Prediction [Link]
Jiangxin Sun, Zihang Lin, Xintong Han, Jian-Fang Hu, Jia Xu, Wei-Shi Zheng
*Advances in Neural Information Processing Systems (**NeurIPS**)*, 2021

Predictive Feature Learning for Future Segmentation Prediction [Link]
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 (**ICCV**)*, 2021

Predicting future instance segmentation with contextual pyramid convlstms [Link]
Jiangxin Sun, Jiafeng Xie, Jian-Fang Hu, Zihang Lin, Jian-Huang Lai, Wenjun Zeng, Wei-Shi Zheng
*Proceedings of the ACM International Conference on Multimedia (**ACM MM**)*, 2019

Research Experience

Instance Segmentation Prediction

Undergraduate & Graduate Researcher in Sun Yat-sen University *Aug. 2018 - Jun. 2023*

- Advisors: Prof. **Wei-Shi Zheng** & Prof. **Jian-Fang Hu** & Prof. **Wenjun Zeng** & Prof. **Jianguo Zhang**
- 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 (e.g., Mask R-CNN) and to predict future pyramid features.
- **Topic 1: Adaptive Context Aggregation**
  - Developed a flexible network for collaboratively predicting multi-level pyramid features.
  - Proposed an adaptive aggregation approach to exploit the underlying structural relationship among pyramid features.
  - Designed auto-path to selectively and adaptively aggregate contextual information among different pyramid levels.
  - Preliminary work accepted by **ACM MM** 2019 [Link] & Revised approach accepted by **TPAMI** in 2021 [Link].
- **Topic 2: Predictive Feature Learning**
  - Pointed out the contradiction between learning discriminative segmentation features and learning reliable future prediction.
  - Designed an autoencoder-based framework to learn a predictive representation of segmentation features via explicitly modeling prediction uncertainty and introducing uncertainty decay.
  - Proposed an uncertainty-aware prediction module to learn both feature prediction and uncertainty estimation.
  - Preliminary work accepted by **ICCV** 2021 [Link] & Revised approach scheduled to be submitted to **TPAMI**.

3D Human Motion Prediction

Computer Vision Group Intern in Huya Inc. *Jul. 2020 - Jul. 2021*

- Advisor: Dr. **Xintong Han**
- **Topic: Action-guided Motion Prediction**
  - Aims to predict future unobserved 3D human motion according to observed past RGB frames. The mainstream is to insert a prediction block into a motion capture model and to predict future latent features.
  - Introduced action information into human motion prediction.
  - Constructed an action-specific memory bank to exploit representative sub-actions and retrieved possible motion dynamics to guide future motion prediction
  - Accepted by **NeurIPS** 2021. [Link]

Intelligent Multimedia Group Intern in Microsoft Research Asia *Aug. 2021 - Jan. 2022*

- Advisor: Dr. **Chunyu Wang**
- **Topic: Non-freezing Dance Generation**
  - Aims to predict future dance choreography conditioned on past motion and music pieces. The mainstream is to learn single-modal feature extractors and a cross-modal predictor.
  - Achieved non-freezing large-magnitude dance generation.
  - Presented bank-constrained manifold projection to suppress the noises in the predicted motions and leveraged the coherence in <past, future> motion dynamics to reduce the uncertainty and ambiguity in motion prediction.
  - Accepted by **NeurIPS** 2022. [Link]

Awards

Outstanding Graduate, *Sun Yat-sen University* *2023*

National Scholarship, *Sun Yat-sen University* *2022*