Yuren **Cong**

Computer Vision · Machine Learning

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Summary

I am a fourth-year PhD student at the Institute for Information Processing at Leibniz University Hanover, focusing on scene understanding, generative models, and Embodied AI, etc. I am co-advised by Prof. Michael Ying Yang and Prof. Bodo Rosenhahn. Previously, I obtained my Bachelor's degree from Hefei University of Technology and my Master's degree from Leibniz University Hanover.

Main Publications

[1] **Yuren Cong**, Hanno Ackermann, Wentong Liao, Michael Ying Yang and Bodo Rosenhahn. **Nodis: Neural Ordinary Differential Scene Understanding**, *Proceedings of the European Conference on Computer Vision, 2020.*

[2] **Yuren Cong**, Wentong Liao, Hanno Ackermann, Bodo Rosenhahn and Michael Ying Yang. **Spatial-Temporal Transformer for Dynamic Scene Graph Generation**, *Proceedings of the IEEE/CVF International Conference on Computer Vision, 2021*

[3] **Yuren Cong**, Michael Ying Yang and Bodo Rosenhahn. **RelTR: Relation Transformer for Scene Graph Generation**, *IEEE Trans on Pattern Analysis and Machine Intelligence, 2023*

[4] **Yuren Cong**, Jinhui Yi, Bodo Rosenhahn and Michael Ying Yang. **SSGVS: Semantic Scene Graph-to-Video Synthesis**, *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, 2023*

[5] **Yuren Cong**, Martin Renqiang Min, Li Erran Li, Bodo Rosenhahn and Michael Ying Yang. **Attribute-Centric Compositional Text-to-Image Generation**, *arXiv preprint, 2023*

[6] **Yuren Cong**, Wentong Liao, Jiawei Ren, Bodo Rosenhahn, Michael Ying Yang. **Learning Similarity between Scene Graphs and Images with Transformers**, *arXiv preprint, 2023*

[7] **Yuren Cong**, Mengmeng Xu, Christian Simon, Shoufa Chen, Jiawei Ren, Yanping Xie, Juan-Manuel Perez-Rua, Bodo Rosenhahn, Tao Xiang and Sen He. **FLATTEN: Optical Flow-guided Attention for Consistent Text-to-Video Editing**, *arXiv preprint, 2023*

Research Experience

Institute for Information Processing, Leibniz University Hanover

Hanover, Germany

PhD Candidate — *Feb. 2020 - PRESENT*

- **Scene understanding**:
  - Propose a two-stage scene graph generation method to infer visual relationships by solving the neural variants of ODE. (cf. Publication [1])
  - Extend image-based scene graph generation to video-based scene graph generation. A spatial-temporal Transformer is proposed to capture the spatial context and temporal dependencies for dynamic relationship inference. (cf. Publication [2])
  - Address the limitations of existing scene graph generation models which have to combine all entity proposals. Scene graph generation is viewed as a set prediction problem. (cf. Publication [3])
- **Generative models**:
  - Propose a multi-modal learning framework connecting video scene graphs and videos, and a generative model for scene graph-to-video synthesis. (cf. Publication [4])
  - Improve the compositional generalization in text-to-image generation. A feature augmentation and an image-free paradigm are introduced to compensate for the data distribution of underrepresented compositions. (cf. Publication [5])
- **Multi-modal learning**:
  - Propose a contrastive learning framework that can measure the similarity of scene graphs and images. (cf. Publication [6])
- 1 paper has been accepted by ECCV 2020.
- 1 paper has been accepted by ICCV 2021.
- 1 paper has been accepted by PAMI.
- 1 ICRA submission and 2 CVPR submission in progress.

Meta AI

London, United Kingdom

Research Scientist Intern — *Jun. 2023 - Oct. 2023*

- **Generative models**:
  - Propose a training-free text-to-video editing framework that enforces the patches on the same optical flow path across different frames to attend to each other in the attention module, thus improving visual consistency. (cf. Publication [7])
- 1 ICLR submission in progress.

Education

Leibniz University Hannover — *Hannover, Germany*
PhD candidate in computer science — *Feb. 2020 - Mar. 2024 (**expected**)*

Leibniz University Hannover — *Hannover, Germany*
M.S. in electrical engineering and information technology — *Oct. 2016 - Sept. 2019*

Hefei University of Technology — *Hefei, China*
B.S. in electrical engineering — *Sept. 2011 - July. 2015*

Other Experience

Institute for Information Processing, Leibniz University Hanover — *Hanover, Germany*
Teaching assistant — *Apr. 2020 - PRESENT*

- Lecture: Imaging systems for medical technology
- Lab: Sampling and quantization

Cruisewatch — *Hanover, Germany*
Machine learning consultant — *Feb. 2020 - PRESENT*

- Recommendation algorithms
- NLP tasks and LLM applications

Robert Bosch GmbH — *Reutlingen, Germany*
Research intern — *July. 2018 - Dec. 2018*

- Time-series classification for the micro-electromechanical system

Institute for Information Processing, Leibniz University Hanover — *Hanover, Germany*
Research assistant — *Nov. 2017 - Feb. 2018*

- Multiple object tracking algorithm optimization

Program Committees

Reviewer, Computer Vision and Pattern Recognition (CVPR)

Reviewer, European Conference of Computer Vision (ECCV)

Reviewer, International Conference of Computer Vision (ICCV)

Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)

Reviewer, International Society for Photogrammetry and Remote Sensing (ISPRS)

Skills

Professional experience Computer Vision, Machine Learning, Software Development

Programming Python, MATLAB, C/C++

Library Pytorch, NumPy, Pandas, Keras, Tensorflow, OpenCV

Operating System Linux, Mac OS, Windows

Language English (fluent), Chinese (native), German (fluent)

Other Git, LaTeX, SLURM, Microsoft Office