Yanyu Xu

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RESEARCH INTERESTS

I am interested in computer vision and deep learning, especially human behavior analysis in image and video, including personalized saliency detection, gaze prediction and saliency detection in 360° videos, pedestrian trajectory prediction, and dancing to music.

EDUCATION

ShanghaiTech University, Shanghai, China — *Sep. 2015 - Present*
Ph.D. Candidate in Computer Science — *Advisor: Dr. Shenghua Gao*
National University of Singapore, Singapore — *Aug. 2019 - Jan. 2020*
Visiting Ph.D student — *Advisor: Dr. Jiashi Feng*
Dalian University of Technology, Dalian, China — *Sep. 2011 - Jul. 2015*
B.Eng. in Network Engineering — GPA: 89.7/100

CONFERENCE PAPERS

Yanyu Xu, Yanbing Dong, Junru Wu, Zhengzhong Sun, Zhiru Shi, Jingyi Yu and Shenghua Gao: "Gaze Prediction in Dynamic 360° Immersive Videos", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), *2018*.

Yanyu Xu*, Zhixin Piao*, and Shenghua Gao: "Encoding Crowd Interaction with Deep Neural Network for Pedestrian Trajectory Prediction", *IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR**), *2018*. [* indicates equal contribution]

Ziheng Zhang*, **Yanyu Xu***, Jinyi Yu, and Shenghua Gao, "Saliency Detection in 360° Videos", *European Conference on Computer Vision*, (**ECCV**), *2018*. [* indicates equal contribution]

Quan Chen, Tiezheng Ge, **Yanyu Xu**, Zhiqiang Zhang, and Kun Gai, "Human Semantic Matting", *ACM International Conference on Multimedia* (**ACM MM**), *2018*.

Yanyu Xu, Nianyi Li, Junru Wu, Jingyi Yu, and Shenghua Gao, "Beyond Universal Saliency: Personalized Saliency Prediction with Multi-task CNN", *In Proceedings of the International Joint Conference on Artificial Intelligence* (**IJCAI**), *2017*. (**Outstanding Student Paper Runner-up**).

Yanyu Xu, Shenghua Gao: "Bi-Level Multi-Column Convolutional Neural Networks for Facial Landmark Point Detection", *European Conference on Computer Vision Workshop*, (**ECCVW**) *2016*.

JOURNAL PAPERS

Yanyu Xu, Shenghua Gao, Junru Wu, Nianyi Li and Jingyi Yu, "Beyond Universal Saliency: Personalized Saliency and its Prediction", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**). (Accepted)

Yanyu Xu, Zhixin Piao, Wen Liu, Ziheng Zhang, Jingyi Yu, and Shenghua Gao: "SUNNet: A Novel Framework for Simultaneous Human Parsing and Pose Estimation", *Neurocomputing* . (Accepted)

PAPERS IN SUBMISSION

Yanyu Xu, Zhixin Piao, Peiyao Wang, Jiashi Feng and Shenghua Gao: "DancingPose: A Simple Model for for Predicting Dancing Pose Sequence from Music". (CVPR 2020 Under review)

Lei Jin, **Yanyu Xu**, Jia Zheng, Jingyi Yu and Shenghua Gao: "Geometric Structure Based and Regularized Depth Estimation From 360° Indoor Imagery". (CVPR 2020 Under review)

Peiyao Wang, **Yanyu Xu**, Weixin Luo and Shenghua Gao: "SIRI-SDR: SpatIal Relation Induced Spatial Description Resolution". (CVPR 2020 Under review)

Yanyu Xu, Yingying Zhang, Zhengxin Li, Desen Zhou, Siqin Chen, Yi Ma and Shenghua Gao, "Multi-column CNN and its Applications for Crowd Counting and Face Alignment", *International Journal of Computer Vision* (**TIP**). (Under review)

Yanyu Xu, Ziheng Zhang, and Shenghua Gao, "Spherical CNNs for Saliency Detection and Gaze Prediction in 360° Videos", *IEEE Transactions on Pattern Analysis and Machine Intelligence* (**TPAMI**). (Under review)

Yanyu Xu, and Shenghua Gao, "Saliency Detection with Visual and Auditory Information in 360° Videos", *IEEE Signal Processing Letters*. (Under review)

TEACHING EXPERIENCE

Teaching Assistant at ShanghaiTech University for:
- Computer Vision II, Spring 2017 — *Instructor: Dr. Shenghua Gao*
- Deep Learning, Fall 2016 — *Instructor: Dr. Yi Ma*

INTERNSHIP EXPERIENCE	Alimama Department, the Alibaba Group *Research Intern*	*Mar. 2018 - Sep. 2018* *Advisor: Dr. Tiezheng Ge*

PROJECT EXPERIENCE

Personalized Saliency and its Prediction *Aug. 2016 - Sep. 2017*
- We propose the first work that considers the personalized saliency.
- We design two models that decomposes a PSM into the combination of USM and discrepancy map between the PSM and USM, including a multi-task CNN framework and a multi-task CNN framework

Encoding Crowd Interaction with DNN for Pedestrian Trajectory Prediction *Jul. 2017 - Nov. 2017*
A Crowd Interaction with Deep Neural Network (CIDNN) model for trajectory prediction is developed, considering all pedestrians in the scene. The developed CIDNN model provides three main features:
- an LSTM based motion encoding strategy;
- location-based spatial affinity measurement;
- trajectory prediction based on the coordinated displacement.

Spherical CNNs for Saliency Detection and Gaze Prediction in 360° Videos *Jan. 2018 - Mar. 2019*
- We define some new spherical operations including spherical convolution, spherical pooling, spherical ConvLSTM cell and spherical MSE loss to deal with the distortion problem for panoramic data.
- Our proposed spherical operations are more natural and useful for human visual attention prediction tasks *i.e.* saliency detection and gaze prediction in 360° videos.
- We construct a large-scale 360° videos saliency detection benchmark that consists of 104 360° videos viewed by 20+ human subjects.

DancingPose: A Simple Model for for Predicting Dancing Pose Sequence from Music *Aug. 2019 - Present*
- We consider a challenging problem of predicting dancing poses from music. Motivated by close relations between music audios and dance motions, we propose a simple model with an audio-guided attention module to predict dance sequences with rhythm consistency.
- We propose a computational metric on the dancing quality that measures the matching degrees between audio beats and feet speeds systematically.
- To validate the generalization of the methods, we introduce an open-set setting and collect 88 songs of four dances.

TALKS

DancingPose: A Simple Model for for Predicting Dancing Pose Sequence from Music
Invited talk at NUS LV Lab seminar, Dec. 2019.

DancingPose: A Simple Model for for Predicting Dancing Pose Sequence from Music
Invited talk at Huawei-NUS Advanced Deep Learning Forum, Nov. 2019.

Beyond Universal Saliency Detection
Invited talk at CS Department, Shanghai University, Nov. 2018.

PROFESSIONAL SERVICES

Conference reviewer: CVPR2019, ICCV2019, AAAI2019, CVPR2020, ECCV2020.
Journal reviewer: IEEE TIP, TCSVT, NeuroComputing.

SKILLS

Python, MATLAB, C++, Caffe, PyTorch, Tensorflow, LaTeX

AWARDS
- Nomination Award of the 2018 Microsoft Research Asia Fellowship
- National Scholarship for Doctoral Students 2018
- Outstanding Student of ShanghaiTech University, 2018 - 2019
- Finalist, Outstanding Student Paper Runner-up of IJCAI 2017
- China National Post-Graduate Mathematical Contest in Modeling, Third Prize, 2017
- Outstanding Student of ShanghaiTech University, 2016 - 2017
- Outstanding Student of ShanghaiTech University, 2015 - 2016

REFERENCES **Shenghua Gao**

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School of Information Science and Technology
ShanghaiTech Univeristy   E-mail: gaoshh@shanghaitech.edu.cn
Jiashi Feng

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National University of Singapore   E-mail: elefjia@nus.edu.sg