HAODONG YAN

Date of birth: 23/08/1999 | **Nationality:** Chinese | **Phone number:** (+86) 15829011780 (Mobile) | **Email address:** hyan758@connect.hkust-gz.edu.cn

EDUCATION AND TRAINING

01/09/2024 – CURRENT
P.H.D IN INTELLIGENT TRANSPORTATION The Hong Kong University of Science and Technology (Guangzhou)

01/09/2021 – 01/07/2024 Xi'an , China
MASTER OF MECHANICAL ENGINEERING Xi'an Jiaotong University

Main courses: Modern Signal Processing Techniques and Applications (4.0) Big Data and Deep Learning (4.0) Computational Method (3.7) Mathematical Statistics (3.4)

Overall GPA: 3.73/4.0 Average Score: 89.68 Rank: 1/281

01/09/2017 – 01/01/2021 Xi'an , China
BACHELOR OF MECHANICAL ENGINEERING Xi'an Jiaotong University

Main courses: Advanced Mathematics 2 (94) Probability and Mathematical Statistics (94) Linear Algebra and Analytic Geometry (86) Advanced Programming (84) Microcomputer Principle and Interface Technology (96)

Overall GPA: 3.75/4.3 Average Score: 88.75 Average Score: 88.75

01/07/2019 – 01/07/2021 Xi'an , China
SECOND BACHELOR OF COMPUTER SCIENCE AND TECHNOLOGY Xi'an Jiaotong University

Main courses: Data Structures and Algorithms (92) A primary of the Internet of Things (89) Data Mining (86) Computer Organization (83)

PUBLICATIONS

CARE: Contextually-Aligned and Realistic 4D Scene Generation from a Single Image and Text

Haodong Yan, Pengxu Hou, Zhide Zhong, Xinhu Zheng, Zhe Liu, Hesheng Wang, Haoang Li
IEEE Transactions on Image Processing (CCF-A, Under Review)

GazeMoDiff: Gaze-guided Diffusion Model for Stochastic Human Motion Prediction

Haodong Yan, Zhiming Hu, Syn Schmitt, Andreas Bulling
Proceedings of the 2024 Pacific Conference on Computer Graphics and Applications (Pacific Graphics), 2024 (CCF B)

Physically-Based Photometric Bundle Adjustment in Non-Lambertian Environments

Cheng Lei, Junpeng Hu, **Haodong Yan**, Mariia Gladkova, Tianyu Huang, Yun-Hui Liu, Daniel Cremers, and Haoang Li
In *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*

A Graph Embedded in Graph Framework with Dual-sequence Input for Efficient Anomaly Detection of Complex Equipment under Insufficient Samples

Haodong Yan, Fudong Li, Jinglong Chen, Zijun Liu, Jun Wang, Yong Feng, Xinwei Zhang
Reliability Engineering & System Safety. October 2023 (CAS Q1)

Memory-augmented Skip-connected Autoencoder for Unsupervised Anomaly Detection of Rocket Engines with Multi-source Fusion

Haodong Yan, Zijun Liu, Jinglong Chen, Yong Feng, Jun Wang
ISA Transactions. February 2023 *(CAS Q2)*

Virtual Sensor-based Imputed Graph Attention Network for Anomaly Detection of Equipment with Incomplete Data

Haodong Yan, Jun Wang, Jinglong Chen, Zijun Liu, Yong Feng
Journal of Manufacturing Systems. June. 2022 *(CAS Q1)*

PROJECTS

01/06/2025 – CURRENT
Hand-object Interaction Video Generation

Supervisor: Prof. Haoang Li (IRPN Lab, HKUST (GZ))
- Propose an informative HOI (Human–Object Interaction) representation that jointly encodes the hand, the interacted object, and the reference object by fusing their segmentation masks with video depth information.
- Propose an automatic annotation method for the HOI representation, leveraging vision–language models (VLMs) to accurately identify the hand, interacted object, and reference object within video data.
- Propose a joint generation approach that leverages both the HOI representation and the original RGB video as supervision signals, enhancing the fidelity and consistency of generated content.

01/10/2024 – 01/06/2025
4D Scene Generation from a Single Image and Text

Supervisor: Prof. Haoang Li (IRPN Lab, HKUST (GZ))
- Propose a novel framework composed of a scene extension and a dynamics synthesis module to generate contextually-aligned and realistic 4D scenes from a single reference image and textual prompt.
- Achieve spatial-aware reference image outpainting via a spatial reasoner, facilitating the synthesis of interactions with objects not depicted in the reference image.
- Design depth-anchored scale alignment and physics refinement algorithms to ensure scale-aligned and physics-accurate dynamics.
- Establish a novel benchmark with reference videos for a comprehensive contextual alignment evaluation.

01/03/2023 – 01/06/2024
Multimodal Diffusion-based Stochastic Human Motion Prediction

Supervisors: Prof. Zhiming Hu (Human-centered AI Lab, HKUST (GZ)) & Prof. Dr. Andreas Bulling (Institute for Visualisation and Interactive Systems, University of Stuttgart)
- Propose a gaze-guided diffusion model for stochastic human motion prediction that uses a spatio-temporal graph attention network to fuse the gaze and motion features and then injects these features into a noise prediction network via a cross-attention mechanism to generate multiple reasonable human motions in the future.
- Conduct extensive experiments on two public datasets for both real-world and AR settings and demonstrate significant performance improvements over state of the art.
- Conduct a user study that shows the motions generated by our method are perceived as more precise and more realistic than those from prior methods.

01/04/2023 – 01/09/2023
Material Estimation for Direct SLAM

Supervisor: Prof. Haoang Li (IRPN Lab, HKUST (GZ)) & Prof. Dr. Daniel Cremers (Computer Vision Group, Technical University of Munich)
- Propose a material estimation algorithm based on sequential images to mitigate the ambiguities.
- Propose a novel weighting scheme for the photometric error function based on illumination and material information to satisfy the photometric consistency in challenging environments with non-Lambertian surfaces.

10/2020 – 01/07/2023
Research on Rocket Engine Health State Recognition System

Supervisor: Prof. Chen Jinglong (*School of mechanical engineering in Xi'an Jiaotong University*)

- Propose an unsupervised learning method named Mem-SkipAE to detect the anomalies in the rocket system with multi-source data.
- Propose an interpretable GNN-based method named VSI-GAT for anomaly detection with incomplete data.
- Propose a device-side multivariate time-series anomaly detection named GG-Nets.

04/2019 – 11/2020

Indoor Assistive Robot for Elderly People

Supervisor: Prof. Jing Yue (*School of Mechanical Engineering in Xi'an Jiaotong University*)

- Develop and deploy a YOLO-based face detection algorithm
- Mechanism design (via Solidworks) and strength check (via Ansys)
- Chinese innovation patent.
- National First Prize of Chinese University Students Mechanical Innovation Competition

Link https://www.youtube.com/watch?v=ma8VQnafok4

HONOURS AND AWARDS

2023

National Scholarship – Ministry of Education, China

2022

National Scholarship – Ministry of Education, China

2022

China Optics Valley Scholarship – Wuhan High-tech Zone government

2021

Outstanding Graduates – Xi'an Jiaotong University

2021

HIWIN Elite Scholarship – HIWIN Technologies Corp.

2020

National First Prize of Chinese University Students Mechanical Innovation Competition – Ministry of Education, China

2019

National First Prize of Chinese Intelligent Robot Fighting Competition – Chinese Association for Artificial Intelligence

WORK EXPERIENCE

INSTITUTE FOR VISUALISATION AND INTERACTIVE SYSTEMS, UNIVERSITY OF STUTTGART – STUTTGART, GERMANY

INTERNSHIP – 25/07/2023 – 01/10/2023

- Code implementation
- Paper writing

COMPUTER VISION GROUP, TECHNICAL UNIVERSITY OF MUNICH

REMOTE INTERNSHIP – 01/04/2023 – 01/12/2023

- Code implementation
- Paper writing
- Data processing

SKILLS

Working Skills

Programming: Python (pytorch, opencv, transformers), C++, LaTeX, Git
English: IELTS Overall 7.0 (Listening 7.0, Reading 8.5, Writing 6.5, Speaking 6.0)

RESEARCH INTERESTS

Human-centric Generation & Understanding (Human Motion Generation, HOI Video Generation, Unified Generation & Understanding Model), 3D Vision (3D/4D Generation & Reconstruction)