

Gao Huang

CONTACT INFORMATION	617A Center Main Building, Tsinghua University Beijing 100084, China	<i>Email:</i> gaohuang@tsinghua.edu.cn <i>Web:</i> www.gaohuang.net
RESEARCH INTERESTS	My research focuses on architecture design, as well as training and inference algorithms, for building efficient foundation models. (Google Scholar Citations > 80,000, h-index: 69)	
APPOINTMENT	Associate Professor (on tenure track), Tsinghua University Department of Automation	12/2021 - Present
	Assistant Professor, Tsinghua University Department of Automation	12/2018 - 12/2021
EDUCATION	PhD, Tsinghua University	09/2009 - 07/2015
	BEng, Beihang University	09/2005 - 07/2009
RESEARCH EXPERIENCE	Postdoc, Cornell University, Ithaca	10/2015 - 08/2018
	Intern, Microsoft Research Asia, Beijing	04/2014 - 10/2014
	Visiting Scholar, Nanyang Technological University, Singapore	02/2014 - 03/2014
	Visiting Scholar, Washington University in St. Louis	01/2013 - 07/2013
REVIEWING & SERVICES	Associate Editor for IEEE Transactions on Pattern Analysis and Machine Intelligence Associate Editor for IEEE Transactions on Big Data Associate Editor for Pattern Recognition Senior Area Chair (SAC) for ICPR (2026) Area Chair (AC) for NeurIPS (2022, 2023, 2025) Area Chair (AC) for CVPR (2021, 2022, 2026) Area Chair (AC) for ICCV (2023, 2025) Area Chair (AC) for ICML (2022) Area Chair (AC) for UAI (2022) Senior Program Committee (SPC) for IJCAI (2021, 2022) Senior Program Committee (SPC) for AAAI (2018, 2020) Reviewer for - International Journal of Computer Vision (IJCV) - IEEE Transactions on Pattern Recognition and Machine Intelligence (TPAMI) - IEEE Transactions on Image Processing (TIP) - IEEE Transactions on Neural Networks and Learning Systems (TNNLS) - IEEE Transactions on Cybernetics - ACM Transactions on Intelligent Systems and Technology (TIST) - Pattern Recognition (PR) - Journal of Machine Learning Research (JMLR) - Machine Learning (ML) - International Conference on Machine Learning (ICML) - Neural Information Processing Systems (NeurIPS) - International Conference on Artificial Intelligence and Statistics (AISTATS) - International Conference on Learning Representations (ICLR) - IEEE Conference on Computer Vision and Pattern Recognition (CVPR) - European Conference on Computer Vision (ECCV) - International Conference on Computer Vision (ICCV) - AAAI Conference on Artificial Intelligence (AAAI)	

AWARDS &
HONORS

- Best Paper Award of ICML Workshop on AI4MATH, 2025
- Asian Young Scientist Fellow, 2024
- CVPR Best Paper Finalists, 2022
- AI 2000 Most Influential Scholar in Computer Vision, AMiner, 2022
- MIT TR 35 Asia-Pacific, MIT Technology Review, 2021
- Research Fund for Outstanding Young Scholars, Nature Science Foundation of China, 2020
- DAMO Qingcheng Award, Alibaba, 2020
- Zhiyuan Young Scholar, Beijing Academy of Artificial Intelligence (BAAI), 2019
- Best Paper Award of NIPS Workshop on Compact Deep Neural Networks Workshop, 2018
- Super AI Leader - Pioneer Award, World AI Conference (WAIC), 2018
- NeurIPS Workshop Best Paper Award, 2018
- CVPR Best Paper Award, 2017

AWARDS &
HONORS
PUBLICATIONS

Conference Publications

1. Bingyi Kang, Yang Yue, Rui Lu, Zhijie Lin, Yang Zhao, Kaixin Wang, Gao Huang, Jiashi Feng. How far is video generation from world model: A physical law perspective. *International Conference on Machine Learning (ICML)* 2025.
2. Yang Yue, Zhiqi Chen, Rui Lu, Andrew Zhao, Zhaokai Wang, Shiji Song, Gao Huang. Does Reinforcement Learning Really Incentivize Reasoning Capacity in LLMs Beyond the Base Model? *ICML Workshop on AI4MATH* 2025. **(Best Paper Award)**
3. Yang Yue, Yulin Wang, Chenxin Tao, Pan Liu, Shiji Song, Gao Huang. CheXWorld: Exploring Image World Modeling for Radiograph Representation Learning. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2025.
4. Wanhua Li, Renping Zhou, Jiawei Zhou, Yingwei Song, Johannes Herter, Minghan Qin, Gao Huang, Hanspeter Pfister. 4D LangSplat: 4D Language Gaussian Splatting via Multimodal Large Language Models. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2025.
5. Qihang Peng, Henry Zheng, Gao Huang. ProxyTransformation: Preshaping Point Cloud Manifold With Proxy Attention For 3D Visual Grounding. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2025.
6. Yang Yue, Yulin Wang, Haojun Jiang, Pan Liu, Shiji Song, Gao Huang. EchoWorld: Learning Motion-Aware World Models for Echocardiography Probe Guidance. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2025.
7. Jiayi Guo, Junhao Zhao, Chaoqun Du, Yulin Wang, Chunjiang Ge, Zanlin Ni, Shiji Song, Humphrey Shi, Gao Huang. Everything to the Synthetic: Diffusion-driven Test-time Adaptation via Synthetic-domain Alignment. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2025.
8. Yifan Pu, Yiming Zhao, Zhicong Tang, Ruihong Yin, Haoxing Ye, Yuhui Yuan, Dong Chen, Jianmin Bao, Sirui Zhang, Yanbin Wang, Lin Liang, Lijuan Wang, Ji Li, Xiu Li, Zhouhui Lian, Gao Huang, Baining Guo. ART: Anonymous Region Transformer for Variable Multi-layer Transparent Image Generation. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2025.
9. Honghui Wang, Shiji Song, Gao Huang. GridMix: Exploring Spatial Modulation for Neural Fields in PDE Modeling. *International Conference on Learning Representations (ICLR Oral)* 2025.
10. Tianzhu Ye, Li Dong, Yuqing Xia, Yutao Sun, Yi Zhu, Gao Huang, Furu Wei. Differential Transformer. *International Conference on Learning Representations (ICLR Oral)* 2025.

11. Wangbo Zhao, Yizeng Han, Jiasheng Tang, Kai Wang, Yibing Song, Gao Huang, Fan Wang, Yang You. Dynamic Diffusion Transformer. *International Conference on Learning Representations (ICLR)* 2025.
12. Rui Lu, Runzhe Wang, Kaifeng Lyu, Xitai Jiang, Gao Huang, Mengdi Wang. Towards Understanding Text Hallucination of Diffusion Models via Local Generation Bias. *International Conference on Learning Representations (ICLR)* 2025.
13. Henry Zheng, Hao Shi, Qihang Peng, Yong Xien Chng, Rui Huang, Yepeng Weng, Zhongchao Shi, Gao Huang. DenseGrounding: Improving Dense Language-Vision Semantics for Ego-centric 3D Visual Grounding. *International Conference on Learning Representations (ICLR)* 2025.
14. Andrew Zhao, Quentin Xu, Matthieu Lin, Shenzhi Wang, Yong-jin Liu, Zilong Zheng, Gao Huang. DiveR-CT: Diversity-enhanced Red Teaming Large Language Model Assistants with Relaxing Constraints. *AAAI Conference on Artificial Intelligence (AAAI Oral)* 2025.
15. Huanqian Wang, Yang Yue, Rui Lu, Jingxin Shi, Andrew Zhao, Shenzhi Wang, Shiji Song, Gao Huang. Model Surgery: Modulating LLM’s Behavior Via Simple Parameter Editing. *Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)* 2025.
16. Henry Zheng, Hao Shi, Yong Xien Chng, Rui Huang, Zanlin Ni, Tianyi Tan, Qihang Peng, Yepeng Weng, Zhongchao Shi, Gao Huang. DenseG: Alleviating Vision-Language Feature Sparsity in Multi-view 3D Visual Grounding. *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPR Workshop)* 2024.
17. Zanlin Ni, Yulin Wang, Renping Zhou, Rui Lu, Jiayi Guo, Jinyi Hu, Zhiyuan Liu, Yuan Yao, Gao Huang. AdaNAT: Exploring Adaptive Policy for Token-Based Image Generation. *European Conference on Computer Vision (ECCV)* 2024.
18. Zeyu Liu, Weicong Liang, Zhanhao Liang, Chong Luo, Ji Li, Gao Huang, Yuhui Yuan. Glyph-ByT5: A Customized Text Encoder for Accurate Visual Text Rendering. *European Conference on Computer Vision (ECCV)* 2024.
19. Rui Huang, Songyou Peng, Ayça Takmaz, Federico Tombari, Marc Pollefeys, Shiji Song, Gao Huang, Francis Engelmann. Learning Fine-Grained Class-Agnostic 3D Segmentation without Manual Labels. *European Conference on Computer Vision (ECCV)* 2024.
20. Yifan Pu, Zhuofan Xia, Jiayi Guo, Dongchen Han, Qixiu Li, Duo Li, Yuhui Yuan, Ji Li, Yizeng Han, Shiji Song, Gao Huang, Xiu Li. Efficient Diffusion Transformer with Step-wise Dynamic Attention Mediators. *European Conference on Computer Vision (ECCV)* 2024.
21. Jiangshan Wang, Yifan Pu, Yizeng Han, Jiayi Guo, Yiru Wang, Xiu Li, Gao Huang. GRA: Detecting Oriented Objects through Group-wise Rotating and Attention. *European Conference on Computer Vision (ECCV)* 2024.
22. Dongchen Han, Tianzhu Ye, Yizeng Han, Zhuofan Xia, Shiji Song, Gao Huang. Agent Attention: On the Integration of Softmax and Linear Attention. *European Conference on Computer Vision (ECCV)* 2024.
23. Rui Huang, Songyou Peng, Ayca Takmaz, Federico Tombari, Marc Pollefeys, Shiji Song, Gao Huang, Francis Engelmann. Segment3D: Learning Fine-grained Class-agnostic 3D Segmentation without Manual Labels. *European Conference on Computer Vision (ECCV)* 2024.
24. Ruyi Xu, Yuan Yao, Zonghao Guo, Junbo Cui, Zanlin Ni, Chunjiang Ge, Tat-Seng Chua, Zhiyuan Liu, Maosong Sun, Gao Huang. LLaVA-UHD: An LMM Perceiving Any Aspect Ratio and High-resolution Images. *European Conference on Computer Vision (ECCV)* 2024.
25. Guokun Wu, Shiqi Luo, Gao Huang, Xiang Li. Vision-Based Detection and Real-Time Adaptive Control Schemes for Autonomous Ultrasound Scanning Robots. *International Conference on Advanced Robotics and Mechatronics (ICARM)* 2024.

26. Chaoqun Du, Yizeng Han, Gao Huang. SimPro: A Simple Probabilistic Framework Towards Realistic Long-Tailed Semi-Supervised Learning. *International Conference on Machine Learning (ICML)* 2024.
27. Jenny Sheng, Matthieu Lin, Andrew Zhao, Kevin Pruvost, Yu-Hui Wen, Yangguang Li, Gao Huang, Yong-Jin Liu. Exploring Text-to-Motion Generation with Human Preference. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2024.
28. Xingqian Xu, Jiayi Guo, Zhangyang Wang, Gao Huang, Irfan Essa, Humphrey Shi. Prompt-free Diffusion: Taking "text" out of Text-to-Image Diffusion Models. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2024.
29. Chenxin Tao, Shiqian Su, Xizhou Zhu, Chenyu Zhang, Zhe Chen, Jiawen Liu, Wenhai Wang, Lewei Lu, Gao Huang, Yu Qiao, Jifeng Dai. HoVLE: Unleashing the Power of Monolithic Vision-Language Models with Holistic Vision-Language Embedding. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2024.
30. Zanlin Ni, Yulin Wang, Renping Zhou, Jiayi Guo, Jinyi Hu, Zhiyuan Liu, Shiji Song, Yuan Yao, Gao Huang. Revisiting Non-Autoregressive Transformers for Efficient Image Synthesis. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)* 2024.
31. Changyao Tian, Chenxin Tao, Jifeng Dai, Hao Li, Ziheng Li, Lewei Lu, Xiaogang Wang, Hongsheng Li, Gao Huang, Xizhou Zhu. ADDP: Learning General Representations for Image Recognition and Generation with Alternating Denoising Diffusion Process. *International Conference on Learning Representations (ICLR)* 2024.
32. Haojun Jiang, Zhenguo Sun, Ning Jia, Meng Li, Yu Sun, Shaqi Luo, Shiji Song, Gao Huang. Cardiac Copilot: Automatic Probe Guidance for Echocardiography with World Model. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2024.
33. Haojun Jiang, Meng Li, Zhenguo Sun, Ning Jia, Yu Sun, Shaqi Luo, Shiji Song, Gao Huang. Structure-aware World Model for Probe Guidance via Large-scale Self-supervised Pre-train. *ASMUS Workshop (ASMUS Workshop)* 2024.
34. Xiangjie Yan, Shaqi Luo, Yongpeng Jiang, Mingrui Yu, Chen Chen, Senqiang Zhu, Gao Huang, Shiji Song, Xiang Li. A Unified Interaction Control Framework for Safe Robotic Ultrasound Scanning with Human-Intention-Aware Compliance. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* 2024.
35. Jiangshan Wang, Yue Ma, Jiayi Guo, Yicheng Xiao, Gao Huang, Xiu Li. COVE: Unleashing the Diffusion Feature Correspondence for Consistent Video Editing. *Neural Information Processing Systems (NeurIPS)* 2024.
36. Wangbo Zhao, Jiasheng Tang, Yizeng Han, Yibing Song, Kai Wang, Gao Huang, Fan Wang, Yang You. Dynamic Tuning Towards Parameter and Inference Efficiency for ViT Adaptation. *Neural Information Processing Systems (NeurIPS)* 2024.
37. R Huang, H Zheng, Y Wang, Z Xia, M Pavone, G Huang. Training an Open-Vocabulary Monocular 3D Detection Model without 3D Data. *Neural Information Processing Systems (NeurIPS)* 2024.
38. Zanlin Ni, Yulin Wang, Renping Zhou, Yizeng Han, Jiayi Guo, Zhiyuan Liu, Yuan Yao, Gao Huang. ENAT: Rethinking Spatial-temporal Interactions in Token-based Image Synthesis. *Neural Information Processing Systems (NeurIPS)* 2024.
39. Dongchen Han, Yifan Pu, Zhuofan Xia, Yizeng Han, Xuran Pan, Xiu Li, Jiwen Lu, Shiji Song, Gao Huang. Bridging the Divide: Reconsidering Softmax and Linear Attention. *Neural Information Processing Systems (NeurIPS)* 2024.
40. Dongchen Han, Ziyi Wang, Zhuofan Xia, Yizeng Han, Yifan Pu, Chunjiang Ge, Jun Song, Shiji Song, Bo Zheng, Gao Huang. Demystify Mamba in Vision: A Linear Attention Perspective. *Neural Information Processing Systems (NeurIPS)* 2024.

41. Rui Huang, Henry Zheng, Yan Wang, Marco Pavone, Gao Huang. Training an Open-Vocabulary Monocular 3D Object Detection Model without 3D Data. *Neural Information Processing Systems* (NeurIPS) 2024.
42. Chenxin Tao, Xizhou Zhu, Shiqian Su, Lewei Lu, Changyao Tian, Xuan Luo, Gao Huang, Hongsheng Li, Yu Qiao, Jie Zhou, Jifeng Dai. Learning 1D Causal Visual Representation with De-focus Attention Networks. *Neural Information Processing Systems* (NeurIPS) 2024.
43. Yang Yue, Yulin Wang, Bingyi Kang, Yizeng Han, Shenzhi Wang, Shiji Song, Jiashi Feng, Gao Huang. DeeR-VLA: Dynamic Inference of Multimodal Large Language Models for Efficient Robot Execution. *Neural Information Processing Systems* (NeurIPS) 2024.
44. Qisen Yang, Zekun Wang, Honghui Chen, Shenzhi Wang, Yifan Pu, Xin Gao, Wenhao Huang, Shiji Song, Gao Huang. PsychoGAT: A Novel Psychological Measurement Paradigm through Interactive Fiction Games with LLM Agents. *Annual Meeting of the Association for Computational Linguistics* (ACL) 2024.
45. Shenzhi Wang, Chang Liu, Zilong Zheng, Siyuan Qi, Shuo Chen, Qisen Yang, Andrew Zhao, Chaofei Wang, Shiji Song, Gao Huang. Boosting LLM Agents with Recursive Contemplation for Effective Deception Handling (Avalon’s Game of Thoughts: Battle Against Deception through Recursive Contemplation). *Annual Meeting of the Association for Computational Linguistics* (ACL) 2024.
46. Jiayi Guo, Xingqian Xu, Yifan Pu, Zanlin Ni, Chaofei Wang, Manushree Vasu, Shiji Song, Gao Huang, Humphrey Shi. Smooth Diffusion: Crafting Smooth Latent Spaces in Diffusion Models. *IEEE/CVF Conference on Computer Vision and Pattern Recognition* (CVPR) 2024.
47. Zhuofan Xia, Dongchen Han, Yizeng Han, Xuran Pan, Shiji Song, Gao Huang. GSVA: Generalized Segmentation via Multimodal Large Language Models. *IEEE/CVF Conference on Computer Vision and Pattern Recognition* (CVPR) 2024.
48. Yong Xien Chng, Henry Zheng, Yizeng Han, Xuchong Qiu, Gao Huang. Mask Grounding for Referring Image Segmentation. *IEEE/CVF Conference on Computer Vision and Pattern Recognition* (CVPR) 2024.
49. Matthieu Lin, Jenny Sheng, Yubin Hu, Yangguang Li, Lu Qi, Andrew Zhao, Gao Huang, Yong-Jin Liu. Exploring Temporal Feature Correlation for Efficient and Stable Video Semantic Segmentation. *AAAI Conference on Artificial Intelligence* (AAAI) 2024.
50. Andrew Zhao, Daniel Huang, Quentin Xu, Matthieu Lin, Yong-Jin Liu, Gao Huang. Expel: LLM Agents are Experiential Learners. *AAAI Conference on Artificial Intelligence* (AAAI **Oral**) 2024.
51. Shenzhi Wang, Qisen Yang, Jiawei Gao, Matthieu Gaetan Lin, Hao Chen, Liwei Wu, Ning Jia, Shiji Song, Gao Huang. Train Once, Get a Family: State-Adaptive Balances for Offline-to-Online Reinforcement Learning. *Neural Information Processing Systems* (NeurIPS) 2023.
52. Weipu Zhang, Gang Wang, Jian Sun, Yetian Yuan, Gao Huang. STORM: Efficient Stochastic Transformer based World Models for Reinforcement Learning. *Neural Information Processing Systems* (NeurIPS) 2023.
53. Yifan Pu, Weicong Liang, Yiduo Hao, Yuhui Yuan, Yukang Yang, Chao Zhang, Han Hu, Gao Huang. Rank-DETR for High Quality Object Detection. *Neural Information Processing Systems* (NeurIPS) 2023.
54. Yang Yue, Rui Lu, Bingyi Kang, Shiji Song, Gao Huang. Understanding, Predicting and Better Resolving Q-Value Divergence in Offline-RL. *Neural Information Processing Systems* (NeurIPS) 2023.
55. Dongchen Han, Xuran Pan, Yizeng Han, Shiji Song, Gao Huang. FLatten Transformer: Vision Transformer using Focused Linear Attention. *IEEE International Conference on Computer Vision* (ICCV) 2023.

56. Yifan Pu, Yiru Wang, Zhuofan Xia, Yizeng Han, Yulin Wang, Weihao Gan, Zidong Wang, Shiji Song, Gao Huang. Adaptive Rotated Convolution for Rotated Object Detection. *IEEE International Conference on Computer Vision (ICCV)* 2023.
57. Yizeng Han, Dongchen Han, Zeyu Liu, Yulin Wang, Xuran Pan, Yifan Pu, Chao Deng, Junlan Feng, Shiji Song, Gao Huang. Dynamic Perceiver for Efficient Visual Recognition. *IEEE International Conference on Computer Vision (ICCV)* 2023.
58. Zanlin Ni, Yulin Wang, Jiangwei Yu, Haojun Jiang, Yue Cao, Gao Huang. Deep Incubation: Training Large Models by Divide-and-Conquering. *IEEE International Conference on Computer Vision (ICCV)* 2023.
59. Yulin Wang, Yang Yue, Rui Lu, Tianjiao Liu, Zhao Zhong, Shiji Song, Gao Huang. EfficientTrain: Exploring Generalized Curriculum Learning for Training Visual backbones. *IEEE International Conference on Computer Vision (ICCV)* 2023.
60. Jiayi Guo, Chaofei Wang, You Wu, Eric Zhang, Kai Wang, Xingqian Xu, Shiji Song, Humphrey Shi, Gao Huang. Zero-shot Generative Model Adaptation via Image-specific Prompt Learning. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
61. Xuran Pan, Tianzhu Ye, Zhuofan Xia, Shiji Song, Gao Huang. Slide-Transformer: Hierarchical Vision Transformer with Local Self-Attention. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
62. Chenyu Yang, Yuntao Chen, Hao Tian, Chenxin Tao, Xizhou Zhu, Zhaoxiang Zhang, Gao Huang, Hongyang Li, Yu Qiao, Lewei Lu, Jie Zhou, Jifeng Dai. BEVFormer v2: Adapting Modern Image Backbones to Bird’s-Eye-View Recognition via Perspective Supervision. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
63. Weijie Su, Xizhou Zhu, Chenxin Tao, Lewei Lu, Bin Li, Gao Huang, Yu Qiao, Xiaogang Wang, Jie Zhou, Jifeng Dai. Towards All-in-one Pre-training via Maximizing Multi-modal Mutual Information. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
64. Chenxin Tao, Xizhou Zhu, Weijie Su, Gao Huang, Bin Li, Jie Zhou, Yu Qiao, Xiaogang Wang, Jifeng Dai. Siamese Image Modeling for Self-supervised Vision Representation Learning. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
65. Qisen Yang, Shenzhi Wang, Matthieu Gaetan Lin, Shiji Song, Gao Huang. Boosting Offline Reinforcement Learning with Action Preference Query. *International Conference on Machine Learning (ICML)* 2023.
66. Zhuofan Xia, Xuran Pan, Xuan Jin, Yuan He, Hui Xue, Shiji Song, Gao Huang. Budgeted Training for Vision Transformer. *International Conference on Learning Representations (ICLR)* 2023.
67. Chaofei Wang*, Qisen Yang*, Rui Huang, Shiji Song, Gao Huang. Efficient Knowledge Distillation from Model Checkpoints. *Neural Information Processing Systems (NeurIPS Spotlight)* 2022.
68. Rui Lu, Andrew Zhao, Simon Shaolei Du, Gao Huang. Provable General Function Class Representation Learning in Multitask Bandits and MDP. *Neural Information Processing Systems (NeurIPS Spotlight)* 2022.
69. Yizeng Han*, Zhihang Yuan*, Yifan Pu, Chenhao Xue, Shiji Song, Guangyu Sun, Gao Huang. Latency-aware Spatial-wise Dynamic Networks. *Neural Information Processing Systems (NeurIPS)* 2022.
70. Andrew Zhao*, Matthieu Gaetan Lin*, Yangguang Li, Yong-jin Liu, Gao Huang. A Mixture Of Surprises for Unsupervised Reinforcement Learning. *Neural Information Processing Systems (NeurIPS)* 2022.

71. Xuran Pan, Tianzhu Ye, Dongchen Han, Shiji Song, Gao Huang. Contrastive Language-Image Pre-Training with Knowledge Graphs. *Neural Information Processing Systems* (NeurIPS) 2022.
72. Yulin Wang*, Yang Yue*, Xinhong Xu, Ali Hassani, Victor Kulikov, Nikita Orlov, Shiji Song, Humphrey Shi, Gao Huang. AdaFocus V3: On Unified Spatial-temporal Dynamic Video Recognition. *European Conference on Computer Vision* (ECCV), 2022.
73. Yizeng Han*, Yifan Pu*, Zihang Lai, Chaofei Wang, Shiji Song, Junfeng Cao, Wenhui Huang, Chao Deng, Gao Huang. Learning to Weight Samples for Dynamic Early-exiting Networks. *European Conference on Computer Vision* (ECCV), 2022.
74. Xuran Pan, Zihang Lai, Shiji Song, Gao Huang. ActiveNeRF: Learning where to See with Uncertainty Estimation. *European Conference on Computer Vision* (ECCV), 2022.
75. Zhuofan Xia, Xuran Pan, Shiji Song, Li Erran Li, Gao Huang. Vision Transformer with Deformable Attention. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022. **(Best Paper Finalists)**.
76. Xuran Pan, Chunjiang Ge, Rui Lu, Shiji Song, Guanfu Chen, Zeyi Huang, Gao Huang. On the Integration of Self-Attention and Convolution. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
77. Yulin Wang, Yang Yue, Yuanze Lin, Haojun Jiang, Zihang Lai, Victor Kulikov, Nikita Orlov, Humphrey Shi, Gao Huang. AdaFocus V2: End-to-End Training of Spatial Dynamic Networks for Video Recognition. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
78. Haojun Jiang, Yuanze Lin, Dongchen Han, Shiji Song, Gao Huang. Pseudo-Q: Generating Pseudo Language Queries for Visual Grounding. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
79. Chenxin Tao, Honghui Wang, Xizhou Zhu, Jiahua Dong, Shiji Song, Gao Huang, Jifeng Dai. Exploring the Equivalence of Siamese Self-Supervised Learning via A Unified Gradient Framework. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
80. Hao Li, Tianwen Fu, Jifeng Dai, Hongsheng Li, Gao Huang, Xizhou Zhu. Autoloss-zero: Searching loss functions from scratch for generic tasks. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
81. Xinglong Sun, Ali Hassani, Zhangyang Wang, Gao Huang, Humphrey Shi. DiSparse: Disentangled Sparsification for Multitask Model Compression. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
82. Jiayi Guo, Chaoqun Du, Jiangshan Wang, Huijuan Huang, Pengfei Wan, Gao Huang. Assessing a Single Image in Reference-Guided Image Synthesis. *AAAI Conference on Artificial Intelligence* (AAAI), 2022
83. Yulin Wang*, Rui Huang*, Shiji Song, Zeyi Huang, Gao Huang. Not All Images are Worth 16x16 Words: Dynamic Vision Transformers with Adaptive Sequence Length. *Neural Information Processing Systems* (NeurIPS) 2021.
84. Chenxin Tao, Zizhang Li, Xizhou Zhu, Gao Huang, Yong Liu, Jifeng Dai. Searching Parameterized AP Loss for Object Detection. *Neural Information Processing Systems* (NeurIPS) 2021.
85. Yiqin Yang, Xiaoteng Ma, Chenghao Li, Zewu Zheng, Qiyuan Zhang, Gao Huang, Jun Yang, Qianchuan Zhao. Believe What You See: Implicit Constraint Approach for Offline Multi-Agent Reinforcement Learning. *Neural Information Processing Systems* (NeurIPS) 2021.

86. Yulin Wang*, Zhaoxi Chen*, Haojun Jiang, Shiji Song, Yizeng Han, Gao Huang. Adaptive Focus for Efficient Video Recognition. *International Conference on Computer Vision (ICCV Oral)* 2021.
87. Chaofei Wang, Jiayu Xiao, Yizeng Han, Qisen Yang, Shiji Song, Gao Huang. Frequency Domain Image Translation: More Photo-realistic, Better Identity-preserving. *International Conference on Computer Vision (ICCV)* 2021.
88. Mu Cai, Hong Zhang, Huijuan Huang, Qichuan Geng, Yixuan Li, Gao Huang. Frequency Domain Image Translation: More Photo-realistic, Better Identity-preserving. *International Conference on Computer Vision (ICCV)* 2021.
89. Yujing Wang*, Yaming Yang*, Jiangang Bai, Mingliang Zhang, Jing Bai, Jing Yu, Ce Zhang, Gao Huang, Yunhai Tong. Evolving Attention with Residual Convolutions. *International Conference on Machine Learning (ICML)* 2021.
90. Xuran Pan*, Zhuofan Xia*, Shiji Song, Li Erran Li, Gao Huang. 3D Object Detection with Pointformer. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
91. Le Yang*, Haojun Jiang*, Ruojin Cai, Yulin Wang, Shiji Song, Gao Huang, Qi Tian. CondenseNet V2: Sparse Feature Reactivation for Deep Networks. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
92. Zhuliang Yao, Yue Cao, Shuxin Zheng, Gao Huang, Stephen Lin. Cross-iteration Batch Normalization. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
93. Yulin Wang, Zanlin Ni, Shiji Song, Le Yang, Gao Huang. Revisiting Locally Supervised Learning: an Alternative to End-to-end Training, *International Conference on Learning Representations (ICLR)* 2021, Online Virtual.
94. Hao Li*, Chenxin Tao*, Xizhou Zhu, Xiaogang Wang, Gao Huang, Jifeng Dai. Auto Seg-Loss: Searching Metric Surrogates for Semantic Segmentation, *International Conference on Learning Representations (ICLR)* 2021, Online Virtual.
95. Yulin Wang, Kangchen Lv, Rui Huang, Shiji Song, Le Yang, Gao Huang. Glance and Focus: a Dynamic Approach to Reducing Spatial Redundancy in Image Classification, *Neural Information Processing Systems (NeurIPS)* 2020, Vancouver, Canada.
96. Zhenda Xie, Zheng Zhang, Xizhou Zhu, Gao Huang, Stephen Lin. Spatially Adaptive Inference with Stochastic Feature Sampling and Interpolation, *European Conference on Computer Vision (ECCV Oral)*, 2020.
97. Le Yang*, Yizeng Han*, Xi Chen*, Shiji Song, Jifeng Dai, Gao Huang. Resolution Adaptive Networks for Efficient Inference. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.
98. Haowei He, Gao Huang, Yang Yuan. Asymmetric Valleys: Beyond Sharp and Flat Local Minima, *Neural Information Processing Systems (NeurIPS Spotlight)* 2019, Vancouver, Canada.
99. Yulin Wang*, Xuran Pan*, Shiji Song, Hong Zhang, Cheng Wu, Gao Huang. Implicit Semantic Data Augmentation for Deep Networks, *Neural Information Processing Systems (NeurIPS)* 2019, Vancouver, Canada.
100. Wenjie Shi, Shiji Song, Hui Wu, Ya-Chu Hsu, Cheng Wu, Gao Huang. Regularized Anderson Acceleration for Off-Policy Deep Reinforcement Learning, *Neural Information Processing Systems (NeurIPS)* 2019, Vancouver, Canada.
101. Hao Li*, Hong Zhang*, Xiaojuan Qi, Ruigang Yang, Gao Huang. Improved Techniques for Training Adaptive Deep Networks, *International Conference on Computer Vision (ICCV)* 2019, Seoul, Korea.

102. Shuang Li, Chi Harold Liu, Binhui Xie, Limin Su, Zhengming Ding, Gao Huang. Joint Adversarial Domain Adaptation, *ACM Multimedia* (ACM MM) 2019, Nice, France.
103. Yan Wang, Zihang Lai, Gao Huang, Brian Wang, Laurens van der Maaten, Mark Campbell, Kilian Q. Weinberger. Anytime Stereo Image Depth Estimation on Mobile Devices, *International Conference on Robotics and Automation* (ICRA), 2019, Montreal, Canada.
104. Zhuang Liu*, Mingjie Sun*, and Tinghui Zhou, Gao Huang, Trevor Darrell. Rethinking the value of network pruning, *International Conference on Learning Representations* (ICLR), 2019, New Orleans, USA.
105. Yang Fu, Yunchao Wei, Yuqian Zhou, Honghui Shi, Gao Huang, Xinchao Wang, Zhiqiang Yao, Thomas Huang, Horizontal Pyramid Matching for Person Re-identification, *AAAI Conference on Artificial Intelligence* (AAAI), 2019, Hawaii USA.
106. Gao Huang*, Shichen Liu*, Laurens van der Maaten and Kilian Weinberger. CondenseNet: An Efficient DenseNet using Learned Group Convolutions. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2018, Salt Lake City, USA.
107. Yan Wang*, Lequn Wang*, Yurong You*, Xu Zou, Vincent Chen, Serena Li, Gao Huang, Bharath Hariharan, Kilian Weinberger. Resource Aware Person Re-identification across Multiple Resolutions. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2018, Salt Lake City, USA.
108. Gao Huang, Danlu Chen, Tianhong Li, Felix Wu, Laurens van der Maaten and Kilian Weinberger. Multi-Scale Dense Convolutional Networks for Resource Efficient Image Classification. *International Conference on Learning Representations* (ICLR **Oral**), 2018, Vancouver, Canada.
109. Zhuang Liu, Jianguo Li, Zhiqiang Shen, Gao Huang, Shoumeng Yan and Changshui Zhang. Learning Efficient ConvNets through Network Slimming. *International Conference on Computer Vision* (ICCV), 2017, Venice, Italy.
110. Gao Huang*, Zhuang Liu*, Laurens van de Maaten and Kilian Weinberger. Densely Connected Convolutional Networks. *IEEE Conference on Computer Vision and Pattern Recognition* (CVPR **Oral**), 2017, Hawaii, USA. (**Best Paper Award**)
111. Gao Huang*, Yixuan Li*, Geoff Pleiss, Zhuang Liu, John E. Hopcroft and Kilian Weinberger. Snapshot Ensembles: Train 1, Get M for Free. *International Conference on Learning Representations* (ICLR), 2017, Toulon, France.
112. Gao Huang*, Chuan Guo*, Matt Kusner, Yu Sun, Fei Sha and Kilian Weinberger. Supervised Word Mover’s Distance. *Neural Information Processing Systems* (NIPS **Oral**), 2016, Barcelona, Spain.
113. Gao Huang*, Yu Sun*, Zhuang Liu, Daniel Sedra and Kilian Weinberger. Deep networks with stochastic depth. *European Conference on Computer Vision* (ECCV **Spotlight**), 2016, Amsterdam, Netherlands. (This paper was recommended as an **Oral Presentation** at NIPS 2016 Deep Learning Symposium.)
114. Gao Huang, Jianwen Zhang, Shiji Song and Zheng Chen. Maximin separation probability clustering. The *AAAI Conference on Artificial Intelligence* (AAAI), 2015, Austin, USA.
115. Gao Huang, Shiji Song, Zhixiang Xu, Kilian Weinberger and Cheng Wu. Transductive minimax probability machine. *European Conference on Machine Learning* (ECML **Oral**), 2014, Nancy, France.
116. Zhixiang Xu, Gao Huang, Kilian Weinberger, Alice Zheng. Gradient Boosted Feature Selection. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (KDD), 2014, New York, NY, USA.
117. Zhixiang Xu, Matt Kusner, Gao Huang and Kilian Weinberger. Anytime representation learning. *International Conference on Machine Learning* (ICML), 2013, Atlanta GA, USA.

Journal Publications

1. Yulin Wang, Zanlin Ni, Yifan Pu, Cai Zhou, Jixuan Ying, Shiji Song, Gao Huang. InfoPro: Locally Supervised Deep Learning by Maximizing Information Propagation. *International Journal of Computer Vision (IJCV)*, 133(5), pp. 2752-2782, 2025.
2. Yulin Wang, Haoji Zhang, Yang Yue, Shiji Song, Chao Deng, Junlan Feng, Gao Huang. Uni-AdaFocus: Spatial-Temporal Dynamic Computation for Video Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 47(3), pp. 1782-1799, 2025.
3. Haojun Jiang, Jianke Zhang, Rui Huang, Chunjiang Ge, Zanlin Ni, Shiji Song, Gao Huang. Cross-modal Adapter for Vision-language Retrieval. *Pattern Recognition (PR)* 2025.
4. Jinrong Zhang, Wujun Wen, Shenglan Liu, Gao Huang, Yunheng Li, Qifeng Li, Lin Feng. End-to-End Streaming Video Temporal Action Segmentation With Reinforcement Learning. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)* 2025.
5. Andrew Zhao, Erle Zhu, Rui Lu, Matthieu Lin, Yong-Jin Liu, Gao Huang. Self-Referencing Agents for Unsupervised Reinforcement Learning. *Neural Networks (NN)* 2025.
6. Gao Huang. Dynamic Neural Networks: Advantages and Challenges. *National Science Review (NSR)* 2024.
7. Yang Yue, Bingyi Kang, Xiao Ma, Qisen Yang, Gao Huang, Shiji Song, Shuicheng Yan. Decoupled Prioritized Resampling for Offline RL. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)* 2024.
8. Xuran Pan, Xiaoyan Han, Chaofei Wang, Zhuo Li, Shiji Song, Gao Huang, Cheng Wu. A Unified Framework for Convolution-based Graph Neural Networks. *Pattern Recognition (PR)* 2024.
9. Yizeng Han, Zeyu Liu, Zhihang Yuan, Yifan Pu, Chaofei Wang, Shiji Song, Gao Huang. Latency-aware Unified Dynamic Networks for Efficient Image Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)* 2024.
10. Yulin Wang, Yang Yue, Rui Lu, Yizeng Han, Shiji Song, Gao Huang. EfficientTrain++: Generalized Curriculum Learning for Efficient Visual Backbone Training. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)* 2024.
11. Le Yang, Ziwei Zheng, Yizeng Han, Shiji Song, Gao Huang, Fan Li. OStr-DARTS: Differentiable Neural Architecture Search Based on Operation Strength. *IEEE Transactions on Cybernetics* 2024.
12. Mixue Xie, Shuang Li, Kaixiong Gong, Yulin Wang, Gao Huang. Adapting Across Domains via Target-oriented Transferable Semantic Augmentation under Prototype Constraint. *International Journal of Computer Vision (IJCV)* 2024.
13. Jiayi Guo, Hayk Manukyan, Chenyu Yang, Chaofei Wang, Levon Khachatryan, Shant Navasardyan, Shiji Song, Humphrey Shi, Gao Huang. FaceCLIP: Facial Image-to-Video Translation via A Brief Text Description. *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)* 2024.
14. Yifan Pu, Yizeng Han, Yulin Wang, Junlan Feng, Chao Deng, Gao Huang. Fine-grained Recognition with Learnable Semantic Data Augmentation. *IEEE Transactions on Image Processing (TIP)* 2024.
15. Chaoqun Du, Yulin Wang, Shiji Song, Gao Huang. Probabilistic Contrastive Learning for Long-Tailed Visual Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2024.
16. Pan Liu, Gao Huang, Jing Jing, Suyan Bian, Liuquan Cheng, Xin Yang Lu, Chongyou Rao, Yu Liu, Yun Hua, Yongjun Wang, Kunlun He. An Energy Matching Vessel Segmentation Framework in 3D Medical Images. *IEEE Transactions on Medical Imaging (TMI)*, 2024.

17. Chunjiang Ge, Rui Huang, Mixue Xie, Zihang Lai, Shiji Song, Shuang Li, Gao Huang. Domain Adaptation via Prompt Learning. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2023.
18. Honghui Wang, Lu Lu, Shiji Song, Gao Huang. Learning Specialized Activation Functions for Physics-informed Neural Networks. *Communications in Computational Physics*, 2023.
19. Qisen Yang, Shenzhi Wang, Qihang Zhang, Gao Huang, Shiji Song. Hundreds Guide Millions: Adaptive Offline Reinforcement Learning with Expert Guidance. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2023.
20. Qisen Yang, Huanqian Wang, Mukun Tong, Wenjie Shi, Gao Huang, Shiji Song. Leveraging Reward Consistency for Interpretable Feature Discovery in Reinforcement Learning. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2023.
21. Gao Huang*, Yulin Wang*, Kangchen Lv, Haojun Jiang, Wenhui Huang, Pengfei Qi, Shiji Song. Glance and Focus Networks for Dynamic Visual Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2022.
22. Yizeng Han, Gao Huang, Shiji Song, Le Yang, Honghui Wang, Yulin Wang. Dynamic Neural Networks: A Survey. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2021.
23. Yizeng Han, Gao Huang, Shiji Song, Le Yang, Yitian Zhang, Haojun Jiang. Spatially adaptive feature refinement for efficient inference. *IEEE Transactions on Image Processing (TIP)*, 30, pp. 9345-9358, 2021.
24. Wenjie Shi, Gao Huang, Shiji Song, Cheng Wu. Temporal-Spatial Causal Interpretations for Vision-Based Reinforcement Learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2021.
25. Peng Jiang, Shiji Song, Gao Huang. Attention-Based Meta-Reinforcement Learning for Tracking Control of AUV With Time-Varying Dynamics, *IEEE Transactions on Neural Networks and Learning System (TNNLS)*, 2021.
26. Yulin Wang, Gao Huang, Shiji Song, Xuran Pan, Yitong Xia, Cheng Wu. Regularizing deep networks with semantic data augmentation, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2021.
27. Qichuan Geng, Hong Zhang, Xiaojuan Qi, Ruigang Yang, Zhong Zhou, Gao Huang. Gated Path Selection Network for Semantic Segmentation. *IEEE Transactions on Image Processing, (TIP)*, 2020.
28. Wenjie Shi, Gao Huang, Shiji Song, Zhuoyuan Wang, Tingyu Lin, Cheng Wu. Self-Supervised Discovering of Interpretable Features for Reinforcement Learning, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2020.
29. Shuang Li, Binhui Xie, Qiuxia Lin, Chi Harold Liu, Gao Huang, Guoren Wang. Generalized Domain Conditioned Adaptation Network, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2020.
30. Gao Huang, Zhuang Liu, Geoff Pleiss, Laurens van der Maaten and Kilian Weinberger. Convolutional Networks with Dense Connectivity, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2019.
31. Shuang Li, Chi Harold Liu, Qiuxia Lin, Qi Wen, Limin Su, Gao Huang, Zhengming Ding. Deep Residual Correction Network for Partial Domain Adaptation, *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2019.
32. Hangkai Hu, Shiji Song, Gao Huang. Self-Attention Based Temporary Curiosity in Reinforcement Learning Exploration, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2019.

33. Le Yang, Shiji Song, Shuang Li, Yiming Chen, Gao Huang. Graph Embedding-Based Dimension Reduction With Extreme Learning Machine, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2019.
34. Benben Jiang, Zhifeng Guo, Qunxiong Zhu and Gao Huang. Dynamic minimax probability machine-based approach for fault diagnosis using pairwise discriminate analysis, *IEEE Transactions on Control Systems Technology*, 27(2), pp. 806-813, 2019.
35. Shuang Li, Shiji Song, Gao Huang, Zhengming Ding and Cheng Wu. Domain invariant and class discriminative feature learning for visual domain adaptation. *IEEE Transactions on Image Processing (TIP)*, 27(9), pp. 4260-4273, 2018.
36. Shuang Li, Shiji Song, Gao Huang, Cheng Wu, "Cross-Domain Extreme Learning Machine for Domain Adaptation", *IEEE Transactions on Systems, Man, Cybernetics : Systems*, 2018.
37. Shiji Song, Yanshang Gong, Yuli Zhang, Gao Huang and Guangbin Huang. Dimension Reduction by Minimum Error Minimax Probability Machine. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 47(1), pp. 58-69, 2016.
38. Shuang Li, Shiji Song and Gao Huang. Prediction reweighting for domain adaptation. *IEEE Transactions on Neural Networks and Learning Systems*, 2016.
39. Gao Huang, Shiji Song, Jatinder Gupta and Cheng Wu. Semi-supervised and unsupervised extreme learning machines. *IEEE Transactions on Cybernetics*, 44 (12), pp. 2405-2417, 2014.
40. Gao Huang, Shiji Song, Jatinder Gupta and Cheng Wu. A second order cone programming approach for semi-supervised learning. *Pattern Recognition (PR)*, 46(12), pp. 3548-3558, 2013.
41. Gao Huang, Shiji Song, Cheng Wu and Keyou You. Robust support vector regression for uncertain input and output data, *IEEE Transactions on Neural Networks and Learning System*, 23 (11), pp. 1690-1700, 2012.
42. Gao Huang, Shiji Song and Cheng Wu. Orthogonal least squares algorithm for training cascade neural networks. *IEEE Transactions on Circuits and Systems I: Regular Papers*, 59 (11), pp. 2629-2637, 2012.

Technical Reports

1. Q Xu, G Huang, Y Yuan, C Guo, Y Sun, F Wu, K Weinberger. An empirical study on evaluation metrics of generative adversarial networks. *Technical Report*, 2018.
2. Geoff Pleiss*, Danlu Chen*, Gao Huang, Tongcheng Li, Laurens van der Maaten and Kilian Q. Weinberger. Memory-Efficient Implementation of DenseNets. *Technical Report*, 2017.

* Equal contribution

TEACHING EXPERIENCE	Undergraduate Course: <i>Pattern Recognition and Machine Learning</i>	Spring 2023, 2024, 2025
	Undergraduate Course: <i>Computer Simulation</i>	Spring 2020, 2021, 2022
	Graduate Course: <i>Nonlinear Programming</i>	Fall 2020 - 2025