Ziqi Pang

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EDUCATION

University of Illinois Urbana-Champaign (UIUC) *September 2021 - Current*
Doctor of Philosophy in Computer Science Advisor: Prof. Yu-Xiong Wang

University of Illinois Urbana-Champaign (UIUC) *September 2021 - May 2024*
Master of Science in Computer Science Advisor: Prof. Yu-Xiong Wang

Peking University (PKU) *September 2016 - June 2020*
Bachelor of Science in Computer Science, Cum Laude GPA: 3.74/4.00, Top 15%

Carnegie Mellon University (CMU) *May 2019 - September 2019*
Summer Research Assistant Advisor: Prof. Martial Hebert

RESEARCH, WORKING, AND INTERNSHIP EXPERIENCE

University of Illinois Urbana-Champaign, Ph.D. Student *September 2021 - Current*
∘ Temporal reasoning. **(1)** Improved memory bank design for video object segmentation (VOS) (RMem - CVPR 2024) **(2)** first long-term temporal fusion and data flywheel for mapping (MV-Map - ICCV 2023); **(3)** streaming motion forecasting, which bridges the gap between forecasting datasets and the real world streaming traffic (Streaming Forecasting - IROS 2023); **(4)** end-to-end vision-centric 3D MOT, significantly decreases the ID-Switches by end-to-end tracking and motion prediction (PF-Track - CVPR 2023).
∘ Visual perception with generative foundation models. **(1)** Diffusion models for depth estimation and referring segmentation (in submission). **(2)** Frozen transformers in language models are effective visual encoder layers (LM4VE - ICLR 2024 Spotlight).

NVIDIA, Research Intern *May 2024 - August 2024*
∘ Online HD Map Prediction. For the autonomous driving group at NVIDIA, we conducted research on building generative pre-training for online high-definition (HD) map predictions..

Toyota Research Institute, Research Intern *May 2022 - December 2022*
∘ 3D tracking and motion forecasting from multiple cameras. End-to-end & BEV MOT and motion prediction decrease tracking errors (ID-Switches) by more than 90% on nuScenes compared to previous state-of-the-arts (PF-Track - CVPR 2023).

TuSimple, AI Residency for Perception in Self-driving *June 2020 - August 2021*
∘ LiDAR-based 3D perception for autonomous driving. Public projects: **(1)** the first transformer-based outdoor 3D detection method, features the sparsity of point clouds and perform well on small objects (SST - CVPR 2022); **(2)** a widely used and robust 3D multi-object tracking framework (SimpleTrack - ECCVW 2022 and patent); **(3)** onboard redundancy system and offboard object auto-labeling from single-object tracking (LiDAR-SOT - IROS 2021).

PEER-REVIEWED PUBLICATIONS

Aligning Generative Denoising with Discriminative Objectives Unleashes Diffusion for Visual Perception
Ziqi Pang, Xin Xu, Yu-Xiong Wang
In Submission to ICLR 2025

InstructG2I: Synthesizing Images from Multimodal Attributed Graphs [InstructG2I]
Bowen Jin, Ziqi Pang, Bingjun Guo, Yu-Xiong Wang, Jiaxuan You, Jiawei Han
NeurIPS 2024

RMem: Restricted Memory Banks Improve Video Object Segmentation [RMem]
Junbao Zhou, Ziqi Pang*, Yu-Xiong Wang*
CVPR 2024

Frozen Transformers in Language Models Are Effective Visual Encoder Layers [LM4VE]
Ziqi Pang, Ziyang Xie, Yunze Man*, Yu-Xiong Wang*
ICLR 2024 (Spotlight)

MV-Map: Offboard HD-Map Generation with Multi-view Consistency [MV-Map]
Ziyang Xie, Ziqi Pang*, Yu-Xiong Wang*
ICCV 2023

Streaming Motion Forecasting for Autonomous Driving [Streaming Forecasting]
Ziqi Pang, Deva Ramanan, Mengtian Li, Yu-Xiong Wang
IROS 2023

Standing Between Past and Future: Spatio-Temporal Modeling for Multi-Camera 3D Multi-Object Tracking [PF-Track]
Ziqi Pang, Jie Li, Pavel Tokmakov, Dian Chen, Sergey Zagoruyko, Yu-Xiong Wang
CVPR 2023

Embracing Single Stride 3D Object Detector with Sparse Transformer [SST]
Lue Fan, Ziqi Pang, Tianyuan Zhang, Yu-Xiong Wang, Hang Zhao, Feng Wang, Naiyan Wang, Zhaoxiang Zhang
CVPR 2022

SimpleTrack: Understanding and Rethinking 3D Multi-object Tracking [SimpleTrack]
Ziqi Pang, Zhichao Li, Naiyan Wang
ECCV Workshop 2022, Patented 2023

Model-free Vehicle Tracking and State Estimation in Point Cloud Sequences [LiDAR-SOT]
Ziqi Pang, Zhichao Li, Naiyan Wang
IROS 2021

PREPRINTS

Unlocking the Full Potential of Small Data with Diverse Supervision [SmallData]
Ziqi Pang, Zhiyuan Hu*, Pavel Tokmakov, Yu-Xiong Wang, Martial Hebert*
Arxiv Preprint 2021

Immortal Tracker: Tracklet Never Dies [ImmortalTracker]
Qitai Wang, Yuntao Chen, Ziqi Pang, Naiyan Wang, Zhaoxiang Zhang
Arxiv Preprint 2021

PATENTS

Multiple target tracking method and apparatus, calculating device and storage medium
Ziqi Pang, Zhichao Li, Naiyan Wang
US Patent App. 17/816,239, 2023

SERVICES

Teaching Assistants for **CS 446 (Machine Learning)** and **CS 445 (Computational Photography)** at University of Illinois Urbana-Champaign (UIUC), and **ICS (Introduction to Computer System)** at Peking University (PKU).

Reviewer for CVPR, ICCV, ECCV, NeurIPS, ICLR, ICML, RA-L, ICRA, IROS.

AWARDS AND SCHOLARSHIPS

Outstanding Graduate at Peking University *June 2020*

Peking University Scholarship at Peking University (Top 10%) *September 2018*

Kwuang-hua Scholarship at Peking University (Top 5%) *September 2017*