

Yizhou Wang

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EDUCATION

UNIVERSITY OF WASHINGTON | PHD IN ELECTRICAL AND COMPUTER ENGINEERING

Expected 2022 | Seattle, WA • GPA: 3.92/4.0

Advised by Professor Jenq-Neng Hwang.

Focus areas: Autonomous Vehicle, Deep Learning, Computer Vision, Sensor Fusion.

UNIVERSITY OF WASHINGTON | MS IN APPLIED MATHEMATICS

Dec 2021 | Seattle, WA • GPA: 3.92/4.0

Focus areas: Computational Mathematics, Data Science.

COLUMBIA UNIVERSITY | MS IN ELECTRICAL ENGINEERING

Feb 2018 | New York, NY • GPA: 3.83/4.0

Advised by Professor Shih-Fu Chang and Professor Liangliang Cao.

Focus areas: Computer Vision, Deep Learning.

NORTHWESTERN POLYTECHNICAL UNIVERSITY (NPU) | BENG IN AUTOMATION

Jun 2016 | Xi'an, China • GPA: 91/100 (top 5%)

Graduation Commencement Student Speaker • Honors List • Outstanding Bachelor Thesis and Outstanding Graduates • Outstanding Student and Principal Scholarship (top 0.2%)

RESEARCH INTERESTS

- **Autonomous Driving:** 3D Object Perception, Multi-Modality Sensor Fusion, Radar Imaging, Point Cloud Analysis, 3D Scene Reconstruction, SLAM, Dataset.
- **Computer Vision:** 3D Vision, Neural Rendering, Multi-Object Tracking (MOT), Multi-Camera Multi-Target (MTMC) Tracking, Segmentation.

SELECTED PUBLICATIONS [GOOGLE SCHOLAR](#)

- [1] **Multi-Object Tracking with mmWave Radars: RadarMOT Framework for Autonomous Driving.**
[YIZHOU WANG](#), J. Cai, J.-T. Huang, Y. Li, H.-M. Hsu, H. Liu, J.-N. Hwang. *In submission*.
- [2] **GaitTAKE: Gait Recognition by Temporal Attention and Keypoint-guided Embedding.**
 H.-M. Hsu, [YIZHOU WANG](#), C.-Y. Yang, J.-N. Hwang, H. Thuc, K.-J. Kim. *ICIP*, 2022.
- [3] **LUNA: Localizing Unfamiliarity Near Acquaintance for Open-Set Long-Tailed Recognition.**
 J. Cai, [YIZHOU WANG](#), H.-M. Hsu, J.-N. Hwang, K. Magrane, C. Rose. *AAAI*, 2022.
- [4] **Split and Connect: A Universal Tracklet Booster for Multi-Object Tracking.**
 G. Wang, [YIZHOU WANG](#), R. Gu, W. Hu, J.-N. Hwang. *IEEE Transactions on Multimedia (T-MM)*. 2022.
- [5] **DIOR: Distill Observations to Representations for Multi-Object Tracking and Segmentation.**
 J. Cai, [YIZHOU WANG](#), H.-M. Hsu, H. Zhang, J.-N. Hwang. *WACV Workshops*, 2022.
- [6] **Multi-Target Multi-Camera Tracking of Vehicles by Graph Auto-Encoder and Self-Supervised Camera Link Model.**
 H.-M. Hsu, [YIZHOU WANG](#), J. Cai, J.-N. Hwang. *WACV Workshops*, 2022.
- [7] **HVPS: A Human Video Panoptic Segmentation Framework.**
[YIZHOU WANG](#), H. Zhang, Z. Jiang, J. Mei, C.-Y. Yang, J. Cai, J.-N. Hwang, K.-J. Kim, P.-K. Kim. *The 6th BMTT Workshop, ICCV* 2021.
- [8] **U3D-MOLTS: Unified 3D Monocular Object Localization, Tracking and Segmentation.**
 H. Zhang, [YIZHOU WANG](#), Z. Jiang, C.-Y. Yang, J. Mei, J. Cai, J.-N. Hwang, K.-J. Kim, P.-K. Kim. *The 6th BMTT Workshop, ICCV* 2021.
- [9] **ACE: Ally Complementary Experts for Solving Long-Tailed Recognition in One-Shot.**
 J. Cai, [YIZHOU WANG](#), J.-N. Hwang. *ICCV* 2021.
- [10] **Rethinking of Radar's Role: A Camera-Radar Dataset and Systematic Annotator via Coordinate Alignment.**
[YIZHOU WANG](#), G. Wang, H.-M. Hsu, H. Liu, J.-N. Hwang. *Workshop on Autonomous Driving (WAD), CVPR* 2021.

- [11] **ROD2021 Challenge: A Summary for Radar Object Detection Challenge for Autonomous Driving Applications.**
YIZHOU WANG, J.-N. Hwang, et al. *ACM ICMR* 2021.
- [12] **Multi-Target Multi-Camera Tracking of Vehicles using Metadata-Aided Re-ID and Trajectory-Based Camera Link Models.**
H.-M. Hsu, J. Cai, YIZHOU WANG, J.-N. Hwang, K.-J. Kim. *IEEE Transactions on Image Processing (T-IP)*. 2021.
- [13] **RODNet: A Real-Time Radar Object Detection Network Cross-Supervised by Camera-Radar Fused Object 3D Localization.**
YIZHOU WANG, Z. Jiang, Y. Li, J.-N. Hwang, G. Xing, H. Liu. *IEEE Journal of Selected Topics in Signal Processing*. 2021.
- [14] **RODNet: Radar Object Detection Using Cross-Modal Supervision.**
YIZHOU WANG, Z. Jiang, X. Gao, J.-N. Hwang, G. Xing, H. Liu. *WACV* 2021.
- [15] **Vehicle 3D Localization in Road Scenes via a Monocular Moving Camera.**
Y. Zhang, A. Zheng, K. Han, YIZHOU WANG, J.-N. Hwang. *IEEE ICASSP* 2021.
- [16] **Traffic-Aware Multi-Camera Tracking of Vehicles Based on ReID and Camera Link Model.**
H.-M. Hsu, YIZHOU WANG, J.-N. Hwang. *ACM Multimedia* 2020.
- [17] **IA-MOT: Instance-Aware Multi-Object Tracking with Motion Consistency.**
J. Cai, YIZHOU WANG, H. Zhang, H.-M. Hsu, C. Ma, J.-N. Hwang. *The 5th BMTT Workshop, CVPR* 2020.
- [18] **LIFTS: Lidar and Monocular Image Fusion for Multi-Object Tracking and Segmentation.**
H. Zhang, YIZHOU WANG, J. Cai, H.-M. Hsu, H. Ji, J.-N. Hwang. *The 5th BMTT Workshop, CVPR* 2020.
- [19] **Monocular Visual Object 3D Localization in Road Scenes.**
YIZHOU WANG, Y.-T. Huang, J.-N. Hwang. *ACM Multimedia* 2019.
- [20] **Exploit the Connectivity: Multi-Object Tracking with TrackletNet.**
G. Wang, YIZHOU WANG, H. Zhang, R. Gu, J.-N. Hwang. *ACM Multimedia* 2019.

HONORS & AWARDS

- The **1st place** of Track 1 KITTI-STEP in the 6th Benchmarking Multi-Target Tracking (BMTT) Challenge at ICCV 2021. (Leader)
- The **1st place** of Track 1 MOTChallenge-STEP in the 6th Workshop on Benchmarking Multi-Target Tracking (BMTT) Challenge at ICCV 2021. (Leader)
- Qualcomm Innovation Fellowship (QIF) 2021 **Finalist**.
- The **5th place** in Human Identification at a Distance (HID) 2020 Challenge at ACCV 2020. (Main Contributor)
- The **1st place** of Track 3 in the 5th Benchmarking Multi-Target Tracking (BMTT) Challenge at CVPR 2020. (Leader)
- The **2nd place** of Track 2 in the 5th Benchmarking Multi-Target Tracking (BMTT) Challenge at CVPR 2020. (Main Contributor)
- ACM Multimedia 2019 **Student Travel Grants**, October 2019.
- **Best Paper Finalist Award** at IEEE Guidance, Navigation and Control Conference (CGNCC), August 2016.
- Graduation Commencement **Student Speaker** at NPU, June 2016.
- **Honors List** and **Outstanding Graduates** at NPU, June 2016.
- **Outstanding Bachelor Thesis** at NPU, June 2016.
- **Outstanding Winner Award** in the Mathematical Contest in Modeling (MCM), April 2015.
- **China National Scholarship** (top 2%), October 2014 & October 2015.
- **Outstanding Student** and **Principal Scholarship** at NPU (top 0.2%), October 2014.
- The **Champion** in 2014 FIRA World Cup Simulation 5V5 Group, November 2014.
- The **Champion** in the 5th International Robots Olympic Competition FIRA 5V5 Group, August 2014.

RESEARCH EXPERIENCE

MULTI-MODALITY OBJECT PERCEPTION FOR AUTONOMOUS VEHICLES | INFORMATION PROCESSING LAB

Sep 2018 – Present | Seattle, WA

- **CRUW Dataset:** Build a camera-radar-LiDAR sensor platform and collect a synchronized and calibrated autonomous driving dataset with different driving scenarios and lighting conditions. Based on the CRUW dataset, we organize the **ROD2021 Challenge** at ACM ICMR 2021. [↗](#)

- **RODNet** (radar-based object detection): Detect and classify objects using radio frequency (RF) signals as the only input with camera-radar cross-modal supervision for adverse scenarios in autonomous driving related applications.
- **RadarMOT** (radar-based multi-object tracking): An accurate and robust framework for joint object detection and tracking with radar RF images as the only input, considering object location, dimension and motion, radar instance features, and Doppler information as cues for detection association among consecutive frames.
- **Camera-Radar Sensor Fusion**: 1) A joint camera-radar bilateral coordinate alignment and ground plane optimization algorithm for object 3D localization in the camera-radar sensor systems. 2) A 3D object detection framework by fusing the information from both camera and radar for more accurate and robust object perception performance.

MULTI-OBJECT TRACKING AND SEGMENTATION | INFORMATION PROCESSING LAB

Jun 2018 – Dec 2021 | Seattle, WA

- **MOT** (multi-object tracking): Propose TrackletNet Tracker (TNT), that aims to build a tracklet graph model and apply a tracklet clustering algorithm, to address multi-object tracking problem for different scenarios.
- **MOTS** (multi-object tracking and segmentation): Propose the MOTS methods, i.e., IA-MOT and LIFTS, for both static surveillance cameras and moving cameras. [The **1st Place** in BMTT Challenge at CVPR 2020]
- **STEP** (segmenting and tracking every pixel): Propose HVPS and U3D-MOLTS for person and vehicles scenarios, respectively. [The **1st Place** in BMTT Challenge at ICCV 2021]
- **MTMC** (multi-target multi-camera tracking): Propose an accurate and robust framework, involving traffic-aware single camera tracking and trajectory-based camera link model for MOT in the multi-camera surveillance systems. [The **1st Place** in AICity Challenge at CVPR 2019]

NERF-BASED HUMAN FACE SYNTHESIS AND RECONSTRUCTION | MICROSOFT RESEARCH

Jun 2021 – Dec 2021 | Bellevue, WA (Remote)

- **Novel View Synthesis** of human faces using the NeRF-based architectures. Focus on a general synthesis model for different human identities with much sparser input reference views.
- **Synthetic Face Dataset**: Create a synthetic face dataset with hundreds of real/fake human identities, expressions, illumination and backgrounds.

OPEN-SET LONG-TAILED OBJECT RECOGNITION | INFORMATION PROCESSING LAB

Jan 2021 – May 2021 | Seattle, WA

- **ACE**: A multi-expert framework for object recognition with imbalanced dataset. Comparing to the existing methods, it is free of pre-training and achieves SoTA performance on the commonly-used long-tailed datasets.
- **LUNA**: A quantitative measurement for novelty in open-set long-tailed recognition. Metric learning is applied for clustering in feature space during closed-set training. Density evaluation with proposed factors is utilized for out-of-distribution and untrained categories detection.

GAIT RECOGNITION | INFORMATION PROCESSING LAB

Sep 2020 – Mar 2021 | Seattle, WA

- **GaitTAKE**: A human re-identification method based on human silhouette sequences. Jointly consider global and local appearance features, temporal attention mechanism, and human pose estimation for reliable and robust gait feature extraction. Achieve SoTA performance on gait recognition benchmarks.

TEMPORAL ACTION LOCALIZATION | DIGITAL VIDEO AND MULTIMEDIA LAB

Mar 2017 – Aug 2017 | New York, NY

- Conduct research on temporal action localization (TAL) that: 1) Determining whether a video contains specific actions or activities; 2) Identifying temporal boundaries (start time and end time) of each action or activity instance.
- Develop a web-based visualization demo for two TAL methods, i.e., Segment-CNN and CDC Networks.

ROBOTICS AND APPLICATIONS | ROBOT SOCCER CENTER, SCHOOL OF COMPUTER SCIENCE, NPU

Apr 2013 – Apr 2014 | Xi'an, China

- Conduct research on basic action control and optimization, ball prediction, and strategy design.
- Lead a project entitled "Intelligence Robot Housekeeper". Built a robot intelligence system, and designed an indoor obstacle avoidance and route planning algorithm using indoor environment modeling.
- Perform as the team leader and win numerous awards in robotics competitions.

WORK EXPERIENCE

MICROSOFT | PART-TIME RESEARCHER

Oct 2021 – Dec 2021 | Remote

Advised by Muscle Wu, Qin Cai, and Zeyu Chen.

MICROSOFT | RESEARCH INTERN

Jun 2021 – Sep 2021 | Remote

Advised by Muscle Wu, Qin Cai, and Zeyu Chen.

HELLO VERA | SOFTWARE ENGINEER

Mar 2018 – Jun 2018 | New York, NY

Advised by Liangliang Cao and James Fan.

ENGINEERED STUDIO | SOFTWARE ENGINEER INTERN

Jan 2017 – Feb 2017 | New York, NY

Advised by Omar Kiyani.

TEACHING EXPERIENCE

- **UW PMP596** (Autumn 2021): Teaching Assistant for *Deep Learning for Big Visual Data*.
Instructed by: Prof. Jenq-Neng Hwang.
- **UW EE443** (Spring 2021): Teaching Assistant for *Design And Application Of Digital Signal Processing*.
Instructed by: Prof. Jenq-Neng Hwang.
- **UW PMP596** (Autumn 2020): Teaching Assistant for *Deep Learning for Big Visual Data*.
Instructed by: Prof. Jenq-Neng Hwang.
- **Columbia ELEN6886** (Spring 2017): Teaching Assistant for *Deep Learning for Computer Vision, Speech, and Language*.
Instructed by: Prof. Liangliang Cao, Xiaodong Cui and Kapil Thadani.

PROFESSIONAL SERVICES

- **Session Chair:** ACM ICMR 2021 Grand Challenge Session.
- **Conference Reviewer:** CVPR, NeurIPS, ICML, ICLR, IROS, WACV, ICMR, ICME, ICIP, etc.
- **Journal Reviewer:** IEEE T-PAMI, IEEE J-STSP, IEEE T-CSVT, IEEE T-ITS, IEEE Access, etc.

SKILLS & LANGUAGES

PROGRAMMING

Python • C • C++ • Matlab • Shell • Java • JavaScript • HTML
• CSS • SQL

DEEP LEARNING FRAMEWORKS

PyTorch • TensorFlow • Keras • Theano

TOOLS

LaTeX • MS Office • Adobe Photoshop • Adobe After Effects • SolidWorks

LANGUAGES

English • Chinese (Mandarin)