Zhihui (Jillian) Wang

Profile

Date of Birth: 09/12/1994 **Work Experience: 6 Years**

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Teaching Qualification & Mentorship Experience

Artificial Intelligence: Machine Learning, Computer Vision, Efficient Deep Learning Systems, and Generative AI
Programming: Python (PyTorch, TensorFlow, Hugging Face)

Mentorship Experience： Mentored **5** interns in research projects leading to an **IJCAI-2023 publication** and **two top-ranking CVPR Workshop competition entries**.

Work experience

Ditu (Beijing) Technology Co., Ltd. Senior Machine Learning Engineer Maps Division (Semantic Perception)
07/2019 – present

Educational Background

09/2016-06/2019 Master Computer Vision, Object tracking, object detection Dalian University of Technology
Advisor: Dr. Dong Wang and Dr. Huchuan Lu, IEEE Fellow
CCS: Online Single Person Tracking for Unmanned Aerial Vehicles: Benchmark and New Baseline
09/2012-06/2016 Bachelor Electrical and Computer Engineering Dalian University of Technology

Awards

2022 Beijing Registered Surveyor
2021 DiDi Technology Co., Ltd. - Map and Public Transportation Team - Polaris Star Award
2019 DiDi Technology Co., Ltd. - Map and Public Transportation Team - Shining Star Award
2016-2018 **National Level Graduate Fellowship**, **National Level Graduate Scholarship**
2016 Dalian Lingshui Scholarship, Outstanding Graduate of Dalian University of Technology
2012-2016 Dalian University of Technology Study Scholarship

Patents and Publications

- Decoupling with Entropy-based Equalization for Semi-Supervised Semantic Segmentation **IJCAI-2023**
- 2nd Place Solution for Waymo Open Dataset Challenge-Real-time 2D Object Detection **CVPR WS-2020**
- Robust and Fast Vehicle Turn-counts at Intersections via an Integrated Solution from Detection, Tracking and Trajectory Modeling **CVPR WS-2019**
- Online Single Person Tracking for Unmanned Aerial Vehicles: Benchmark and New Baseline **ICASSP-2019**
- Online Vehicle Tracking in Aerial Imagery **IScIDE-2017**
- Traffic accident recognition method, device, electronic device and medium **ID: CN112926575A**
- Vehicle counting method and system, data processing equipment and intelligent shooting equipment **ID: CN111652912B**
- Method and apparatus for presenting road information **ID: WO2022156553A1**
- Method and device for detecting bus lane, electronic equipment and storage medium **ID: CN112733793A**

Project Experience

- **Real-Time Road Event Detection System**
  - **End-to-End AI System Development:** Designed and deployed a scalable terminal+cloud pipeline for dynamic event detection, processing 10M+ dashcam videos daily;

→ ***Teaching Relevance:*** Ideal case study for "Large-Scale CV System Design" courses, covering data ingestion, distributed processing, and model serving.

- **Edge AI Optimization:** Achieved <5% CPU utilization on ARM A53 via model compression (ShuffleNetV2, MobileNetV3), knowledge distillation, and NAS.
  → ***Teaching Relevance:*** Efficient Deep Learning, suitable for lab modules on distillation/pruning/TensorRT.
- **Cloud-Based AI Verification Suite:** Engineered a multi-model server-side framework achieving 99.2% event validation accuracy:
  - FCOS-based detection for real-time object localization
  - Swin Transformer ensembles for contextual scene parsing
  - Topology-aware segmentation (HRNet) for road structure reconstruction

  → ***Teaching Relevance:*** Modern CV Stack Design, modular architecture combining CNNs, transformers, and geometric CV.
- **Self-Improving Data Pipeline:** Implemented automated edge-to-cloud validation loops, boosting small-model accuracy by 15%.
  → ***Teaching Relevance:*** MLOps in Production, feedback-driven model iteration cycles designing.
- **Industry-Leading Impact:** Scaled to process 5,000+ high-priority events/day (95% precision), outperforming competitors' reliability metrics.
  → ***Teaching Relevance:*** Provides measurable benchmarks for "AI System Evaluation" coursework on precision/throughput trade-offs.

- **Multimodal Traffic Scene Intelligence**
  - **Dataset Curation:** Built Traffic Dynamic Event Benchmark using ChatGPT-4 for semantic annotation, covering 3+ event types with geo-context (location, road grade) and vehicle attributes.
  - **Model Architecture:**
    - ✓ **Vision backbone:** ViT-L/14;
    - ✓ **Text encoder:** InternLM 2.5;
    - ✓ **Multimodal fusion:** Cross-attention layers with learnable scene priors;
  - **Training Pipeline:** Implemented LoRA-based fine-tuning (8x faster than full-parameter tuning);
  - **Performance & Deployment:** Achieved 96.4% precision/91.2% recall via:
    - ✓ Hard negative mining for rare accident types (fog/night scenes)
    - ✓ Dynamic thresholding based on scene complexity levels
    - ✓ Automated triggering reduced incident response time by 63%

  → ***Teaching Relevance*****:** Multimodal AI courses
- **Other business**
  - **HydraNet Fusion Architecture:** Multi-Task Detection, simultaneous processing of traffic signs (98.2% mAP), electronic surveillance devices (91% mAP), Traffic light states (95% mAP).
    → ***Teaching Relevance:*** Multi-Task Learning Systems.
  - **Boundary Style Recognition:** Combined lane detection and road-feature segmentation models to classify boundary styles. Built from scratch (0→1) a lane-boundary intelligence system capable of detecting and updating lane-level map styles (left/right/shoulder/median).
    → ***Teaching Relevance:*** The application of object detection and object segmentation.